REVA UNIVERSITY

Bengaluru, India

SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING

B. TECH IN ELECTRICAL AND ELECTRONICS ENGINEERING

2017-21

Rukmini Educational Charitable Trust

REVA UNIVERSITY
Bengaluru, India

SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING

B.Tech (Electrical and Electronics Engineering) Program

HANDBOOK

2017-21

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Rukmini Educational Charitable Trust

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MESSAGE FROM THE HON'BLE CHANCELLOR

Dr. P. Shyama Raju
Chancellor
REVA University

Education during recent years has witnessed a great transformation. Today's society, termed as "Knowledge Society" has brought about unprecedented economic and social growth. This has propelled universities across the world to devise new ways of tapping human potential for different competencies and building a vibrant society with a win-win situation for all.

REVA University has seen the light of the day to imbibe this character of paradigm shift in academic pursuits to contribute to the knowledge society. REVA works hard to bring in you an exciting and rewarding educational experience, to discover new interests and to develop your career prospects. You will benefit from a unique approach to student-centered learning through group work and individual study tackling real world challenges alongside experienced practitioners and researchers.

REVA has excellent learning facilities including custom built teaching facilities designed specifically to emulate working conditions, air-conditioned library opened for your studies from early morning till midnight and facilities for variety of sports and cultural activities.

Our faculties have introduced socially relevant and market driven engineering courses after studying the requirements of industries in detail and consulting entrepreneurs, experts in different areas of commerce and industry and other stake-holders. I am glad that the Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) being adopted will facilitate learning environment under continuous guidance and monitoring by the faculty and equip you with competent skills to opt fordifferent job prospects across the global.

I hope that the present scheme of instructions, continuous periodic progress assessments, course curriculum of B.Tech First year and other information provided in this hand book will guide you to choose appropriate courses of study and move ahead in the right direction in your chosen area of study.I hope you will enjoy and experience the curriculum, the student-centered teaching and learning ambience in developing your personality to become successful professionals, entrepreneurs and proud citizens of the country.

I wish you every success in your career.

Dr. P. Shyama Raju
Chancellor, REVA University

MESSAGE FROM THE VICE CHANCELLOR

Higher education across the globe is opening doors of its academic disciplines to the real world experiences. The disciplinary legitimacy is under critical review. Trans-border mobility and practice learning are being fore-grounded as guiding principles. Interactive learning, bridging disciplines and facilitating learners to gain different competencies through judicious management of time is viewed as one of the greatest and fascinating priorities and challenges today.

All the programs in REVA University are designed with a great care and after detailed market survey of present requirements and job opportunities. Experts in respective areas of study from primary institutions, industries, research organizations, business sectors and such others have been involved in designing the curriculum of each program.

The L: T: P structure of teaching and learning under Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) would certainly help our students learn and build competencies needed in this knowledge based society. It provides students an opportunity to choose subject(s) of interest in other areas of study and learn courses with students of different subjects. It facilitates cross cultural learning. It further facilitates students to move in fast track and earn additional certificates and diploma.

The well qualified, experienced, committed teachers in REVA University will involve students in integrative learning and application environment within and outside the university. They will certainly mould them with knowledge, skill and ethical values and empower them to face the competitive world with courage and confidence.

This handy document containing a brief information about ***B.Tech in Electrical ElectronicsEngineering***, scheme of instruction, course content, CBCS-CAGP regulations and its advantages and calendar of events for the year will serve as a guiding path to students to move forward in a right direction. It is for the students to be disciplined, committed and to work hard and make use of enormous resources and expert faculties to accomplish all round development of their personalities and succeed withflying colours not only in earning degree but also in their future career as leaders and proud citizens of mother India.

Dr. S.Y. Kulkarni
Vice-Chancellor

MESSAGE FROM THE DIRECTOR

The B.Tech in Electrical Engineering is designed keeping in view the current situation and possible future developments, both at national and global levels. This course is designed to give greater emphasis on core Electrical Engineering. There are ample number of courses providing knowledge in specialized areas of power system, electrical machines, control system, power electronics etc. facilitating students to choose specialized areas of their interest. Adequate attention is given to provide students the basic concepts.

Electrical engineering is one of the earliest to start among the core subjects. The structure of the course has undergone a face-lift with the introduction of subjects from computer science and electronics engineering streams. Thus students in Electrical engineering have the flexibility to broaden their horizons in electronics or software related industries apart from the core related fields. For example, signal processing and communication theory related to mobile technology needs signal processing, robotics require control theory as well as programming skills and integrated circuits need VLSI techniques. Thus the electrical engineering stream is designed to provide you with several options to choose from for your later years. Electrical Engineering use mathematics, electronics, computing techniques and physics to solve real world problems. The Indian government plans to add another 100 GW of generation capacity during 2012-2017 and to pump 1.4 trillion to build national power transmission grid which will enhance inter-regional transmission capacity to 32 GW by 2013. Hence power sector offers lots of job opportunities for well qualified graduates.

The program is thus designed to expose students to various subjects having applications in power sectors, and IT and electronics related industries through outcome based teaching and learning process which emphasizes practical exposure rather than memorization. The curriculum caters to and has relevance to local, regional, national, global developmental needs. Maximum number of courses are integrated with cross cutting issues with relevant to professional ethics, gender, human values, environment and sustainability. A variety of activities such as mini projects, seminars, interaction with industries, cultural activities and social activities are in place to shape the all-round development of students.

The curriculum caters to and has relevance to local, regional, national, global developmental needs.

Maximum number of courses are integrated with cross-cutting issues with relevant to professional ethics, gender, human values, environment and sustainability.

If you are interested in any one of the following, then EEE is the option you should consider.

- Power sector- to design robust power system, to implement measures to keep the system secure, to maintain quality of power, to mitigate harmonics, to damp oscillations, to design protective measures using relays and circuit breaker etc
- Renewable energy sources- to harness power from renewable sources using power

electronics devices, to study integration of these sources with the grid.

- Transport- electric vehicles, vehicle to grid power transactions
- High –Voltage engineering – study of breakdown mechanisms of insulators, search for new types of insulators, development of high voltage testing equipment.
- Power Electronics- design of compact and highly efficient power supplies, battery energy storage system, ultra-capacitor applications, aerospace power requirements, UPS, applications in power system using FACTS devices, interconnection of two regions via HVDC link.
- Computer – Developing algorithms to solve complex functions, developing simulation tools to simulate the entire system, applications to SMART grid.

The benefits of choosing Electrical and Electronics Engineering are:

- Flexibility to choose various fields upon graduation.
- Opportunity to work on live problems.
- Opportunity to work on environmental related technologies.
- Opportunity for programmers to develop software for electrical related projects.

I am sure the students choosing B Tech in Electrical and Electronics Engineering in REVA University will enjoy the curriculum, teaching and learning environment, the vast infrastructure and the experienced teachers involvement and guidance. We will strive to provide all needed comfort and congenial environment for their studies. I wish all students pleasant stay in REVA and grand success in their career.

Dr. Rajashekar P. Mandi
Director
School of Electrical and Electronics Engineering

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RUKMINI EDUCATIONAL CHARITABLE TRUST

It was the dream of late Smt. Rukmini Shyama Raju to impart education to millions of underprivileged children as she knew the importance of education in the contemporary society. The dream of Smt. Rukmini Shyama Raju came true with the establishment of Rukmini Educational Charitable Trust (RECT), in the year 2002. **Rukmini Educational Charitable Trust** (RECT) is a Public Charitable Trust, set up in 2002 with the objective of promoting, establishing and conducting academic activities in the fields of Arts, Commerce, Education, Engineering, Environmental Science, Management and Science & Technology, among others. In furtherance of these objectives, the Trust has set up the REVA Group of Educational Institutions comprising of REVA Institute of Technology & Management (RITM), REVA Institute of Science and Management (RISM), REVA Institute of Management Studies (RIMS), REVA Institute of Education (RIE), REVA First Grade College (RFGC), REVA Degree College (Evening), REVA Independent PU College at Kattigenahalli, Ganganagar and Sanjaynagar and now REVA University. Through these institutions, the Trust seeks to fulfill its vision of providing world class education and create abundant opportunities for the youth of this nation to excel in the areas of Engineering, Commerce, Management, Education, Arts and Science & Technology.

Every great human enterprise is powered by the vision of one or more extraordinary individuals and is sustained by the people who derive their motivation from the founders. The Chairman of the Trust is Dr. P. Shyama Raju, a developer and builder of repute, a captain of the industry in his own right and the Chairman and Managing Director of the DivyaSree Group of companies. The idea of creating these top notch educational institutions was born of the philanthropic instincts of Dr. P. Shyama Raju to do public good, quite in keeping with his support to other socially relevant charities such as maintaining the Richmond road park, building and donating a police station, gifting assets to organizations providing accident and trauma care, to name a few.

The Rukmini Educational Charitable Trust drives with the main aim to help students who are in pursuit of quality education for life. REVA is today a family of ten institutions providing education from PU to Post Graduation and Research leading to M. Phil and PhD degrees. REVA has well qualified experienced teaching faculty of whom majority are doctorates. The faculty is supported by committed administrative and technical staff. Over 11,000 students study various courses across REVA's three campuses equipped with exemplary state-of-the-art infrastructure and conductive environment for the knowledge driven community.

ABOUT REVA UNIVERSITY

REVA University established under the Government of Karnataka Act 80 of the year 2012 and notified in the Karnataka Gazette dated 7th Feb, 2013, is located 14 kms away from the Bangalore International Airport on the way to Bangalore city. The university has a sprawling lush green campus spread over 45 acres of land equipped with state-of-the-art infrastructure and conductive environment for higher learning.

The REVA campus has well equipped laboratories, custom-built teaching facilities designed specifically to emulate working conditions, fully air-conditioned library and central computer centre kept open from morning 8.00 AM till mid-night for the students and the faculty. The well planned sports facility for variety of sports activities, facilities for cultural programs and friendly campus lifestyle add to the overall personality development of students. The campus also has residential facility for students, faculty and other staff. Currently, REVA University offers 18 Post Graduate programs and 15 Graduate programs in Engineering, Architecture, Science and Technology, Commerce, Management Studies, Humanities and Legal Studies in addition to research degrees leading to PhD in different disciplines. The University aims to offer many more PG and UG programs in Science, Arts, Commerce, Engineering, Science& Technology, Management Studies, Education, in the years to come.

The programs being offered by the REVA University are well planned and designed after detailed study with emphasis on knowledge assimilation, applications, global job market and their social relevance. Highly qualified, experienced faculty and scholars from reputed universities / institutions, experts from industries and business sectors have contributed in preparing the scheme of instruction and detailed curricula for this program. Greater emphasis on practice in respective areas and skill development to suit to respective job environment has been given while designing the curricula. The Choice Based Credit System and Continuous Assessment Graded Pattern (CBCS – CAGP) of education has been introduced inall programs to facilitate students to opt for subjects of their choice in addition to the core subjects of the study and prepare them with needed skills. The system also allows students to move forward under the fast track for those who have the capabilities to surpass others. These programs are taught by well experienced qualified faculty supported by the experts from industries, business sectors and such other organizations. REVA University has also initiated many supportive measures such as bridge courses, special coaching, remedial classes, etc., for slow learners so as to give them the needed input and build in them confidence and courage to move forward and accomplish success in their career. The University has also entered into MOUs with many industries, business firms and other institutions seeking their help in imparting quality education through practice, internship and also assisting students' placements.

ABOUT SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING

The School of Electrical Engineering is supported by well qualified and dedicated faculty members. The school of Electrical and Electronics Engineering under REVA University is established in the year 2014 with an aim of developing human resources in the area of Electrical and Electronics Engineering. The School of EEE offers under graduate (UG) course in 'Electrical and Electronics Engineering' and post graduate (PG) course in 'Advanced Power Electronics' along with Doctoral program in various research areas of Electrical Engineering. It has experienced and qualified faculty in various areas such as Power systems, Power Electronics, VLSI, Signal processing, Embedded systems, Industrial drives, Energysystems and Control systems. The School is well equipped with laboratories catering to the development of experiments and projects in the aforementioned areas. The School has state of art computing facilities and latest softwares. Along with technical skills the School conducts various extracurricular and co- curricular activities to develop overall personality of the students.

The faculties have number of publications in reputed national and international journals/conferences. The school is also involved in funded research projects. The other important features of the school are individual counseling of students for academic performance, additional coaching classes for important subjects for all the semesters, soft skill development classes, scientific and student centered teaching- learning process.

Student's welfare is given utmost priority here at School of Electrical Engineering. Advanced learning methods are adopted to make learning truly interactive. More focus is on discussion and practical applications rather than rote learning. Notes/handouts are given and critical thinking questions are asked to test understanding. Experienced, well qualified and friendly faculties always strive hard to provide best of education to students.

This is reflected in various core subjects offered within the program

Vision

"The School of Electrical & Electronics engineering aspires to develop excellent human resources with leadership qualities, ethical and moral values, research culture and innovative skills through higher education of global standards"

Mission

"To mould students to become skilled, ethical and responsible engineers for the betterment of society."

Programme Educational Objectives (PEOs)

The programme helps to develop critical, analytical, innovative, creative and problem solving abilities amongst its graduates. The programme makes the graduates employable as electrical and electronic engineers in power and energy, manufacturing and service sectors. With further education and earning of higher level degrees help the graduates to pursue a career in academics or scientific organisations as researchers.

The Programme Educational Objectives are to prepare the students to:

1) Work as a member of a team for successful career and communicate effectively in multidisciplinary environment with highest ethics.
2) continue to learn in the areas of Electrical & Electronics Engineering and allied areas and implement effective strategies with the advancement of technologies in Electrical & Electronics Engineering
3) become an entrepreneur in the domain of Electrical & Electronics Engineering and other allied areas

Programme Outcomes (POs)

After undergoing this programme, a student will be able to:

1. An ability to understand the concept, identify, formulate, and solve complex electrical engineering problems by applying knowledge & principles of engineering, science, and mathematics
2. Identify, formulate, review research literature, analyze, interpret and draw conclusions from quantitative & qualitative data of an electrical and electronics system, component, or process to meet desired needs.
3. Design solutions for engineering problems and system components related electrical & electronic systems that meet economic, environmental, social, political, health and safety, and sustainability requirements.
4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions in the field of electrical & electronics engineering.
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex electrical and electronics circuits with an understanding of the limitations
6. Apply contextual knowledge to assess social, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Apply ethical principles and solve professional, legal and ethical issues pertaining to electrical & electronics engineering and its related fields
9. Function effectively as a team member or leader in diverse teams to accomplish a common goal in a multi-disciplinary teams

10. Communicate effectively on complex engineering activities with the engineering community and with society at large in both verbal and written forms.
11. Demonstrate knowledge and understanding of the engineering and managementprinciples to manage projects effectively in diverse environments as a member or leader of a team.
12. Engage in independent and life-long learning in the broader context of technological change for continued professional development.

Program Specific outcome:

1. Apply the fundamentals of mathematics, science and engineering knowledge to identify, formulate, design and investigate complex engineering problems of electric circuits,analog and digital electronics circuits, control systems, electrical machines, power system, renewable energy system and electric vehicle.
2. Apply the appropriate, state of the art techniques and modern engineering hardware and software tools in electrical and electronics engineering to engage in life-long learning and to successfully adapt in multi-disciplinary environments.
3. Aware of the impact of professional engineering solutions in societal, environmental context, professional ethics and be able to communicate effectively.

Member of Board of Studies

Sl. No.	Name of Members	Designation
1	Dr. Rajashekar P Mandi Director & Professor, REVA University EEE Department rajashekarpm@reva.edu.in & Ph: 9448465065	Chairperson
2	Dr. Divakar B P Professor Director R&D REVA University divakar@reva.edu.in & Ph:9482009544	Member
3	Dr. Ravishankar Deekshith Prof & HOD Electrical Engineering Department BMCE, Bull Temple Road	Member
4	Dr. Ravikumar Prof & HOD Electrical Engineering Department, NMIT, BANGALORE hmrgama@gmail.com & Ph: 8105561726	Member
5	Dr. Narendranath Udupa Principal Scientist Philips Research ASIA Manayatha Tech Park Bangalore narendranath.udupa@philips.com & Ph: 9845292110	Member
6	Mr. Paramesha. K Deputy Director (Power System) Karnataka Electricity Regulatory Commission No. 9/2, 6th Floor, Mahalakshmi Chambers M.G. Road Bengaluru -56 00 01. kparamesha@gmail.com & Ph: 9448235019	Member
8	Mr. K. Narayana Swamy Professor, REVA ITM EEE Department kns@revainstitution.org & Ph: 9448736750	Member
9	Dr. Vishu Kumar Assoc. Professor Department of Basic Science, Mathematics REVA ITM vishukumar@revainstitution.org & Ph: 9845871372	Member
10	Mr. Gopinath Assoc. Professor EEE DEPARTMENT REVA ITM gopinath@revainstitution.org & Ph: 9449668379	Member
13	Mr. Mahesh G.S. Asst. Professor School of Electrical & Electronics Engg. REVA University, Bangalore	Member

ADVISORY BOARD

Sl. No.	Name of Members
1	Dr Adrian Inoinovici, Fellow IEEE, Director, Power Electronics and Green Energy Centre, Sun-Yat-Sen University, China. adrian@hit.ac.il
2	Dr Danny Sutanto, Professor of Power Engineering, School of Electrical, Computer and Telecommunications Engineering, University of Wollongong, Australia. soetanto@uow.edu.au
3	Dr K.W. Eric Cheng, Professor, Director of Power Electronics research Centre, The Hong Kong Polytechnic University, Hong Kong. eeecheng@polyu.edu.hk
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5	Dr. Z. H. Sholapurwala Managing Director Zeonics Systech Defence & Aerospace Engineers Pvt. Ltd. zeonicssystech@india.com
6	K N Singh Manager-Marketing - Special Applications EFD Induction Private Limited Mob: +91 98456 05871 skn@efdgroup.net

CBCS (CHOICE BASED CREDIT SYSTEM) AND CAGP (CONTINUOUS ASSESSMENT AND GRADING PATTERN) OF EDUCATION AND ITS ADVANTAGES

CBCS is a proven, advanced mode of learning in higher education. It facilitates students to have freedom in making their own choices for acquiring a Degree / Masters Degree program. It is more focused towards the student's choice in providing a wide range of modules available in a single campus across various disciplines offered by experts in the subjects. It leads to quality education with active teacher- student participation.

Studying under CBCS has following advantages:

- Students may undergo training in cross-disciplinary and multi-disciplinary subjects and acquire more focused and preferred knowledge.
- Students may get more skills from other subject(s) which are required for the career path in addition to their regular subject knowledge.
- Students may get ample opportunities to use the laboratories and gain practical exposure to the much needed modules available in other departments/schools for want of scientific inputs.
- Courses are conducted by subject experts identified on the basis of their experiences. Courses taught by such experts may provide in-depth information and clear understanding of the modules.
- Students may get an opportunity to study courses with other students of different programs and exchange their views and knowledge in a common class room.
- CBCS provides a cross-cultural learning environment.
- Students may benefit much from selecting the right options to successfully face the public service examinations like UPSC, KPSC, IES wherein the knowledge of additional subjects become mandatory for general or optional papers.
- Students are exposed to the culture of universal brotherhood during their campus life.
- Students are allowed to practice various methods of learning a subject.

Summary of REVA University Regulations for Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) for Engineering Graduate Degree Programs, 2017

1. **Teaching and Learning Process:**
   The teaching &Learning process under CBCS – CAGP of education in each course of study will have four components, namely**:**:

   (i) L= Lecture (ii) T= Tutorial (iii) P=Practice, (iv) D=Dissertation / Project; where:

   L stands for **Lecture** session consisting of classroom instruction.

   T stands for **Tutorial** session consisting participatory discussion / self study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes.

   P stands for **Practice** session and it consists of Hands on Experience / Laboratory Experiments / Field Studies / Case Studies that equip students to acquire the much required skill component.

   D stands for Dissertation / Project to be carried out as a part of the course work.

2. **Courses of Study and Credits**
   a. The study of various subjects in B Tech degree program are grouped under various courses. Each of these course carries credits which are based on the number of hours of teaching and learning.

   b. In terms of credits, every **one hour session of L amounts to 1 credit per Semester.** In terms of credits, every **one hour session of L amounts to 1 credit per Semester** and a minimum of **two hour session of T or P amounts to 1 credit per Semester or a three hour session of T / P / D amounts to 2 credits** over a period of one Semester of 16 weeks for teaching- learning process.

   c. The total duration of a semester is 20 weeks inclusive of semester-end examination.

   d. **A course shall have either or all the four components.** That means a course may have only lecture component, or only practical component or combination of any two or all the three components.

   e. The total credits earned by a student at the end of the semester upon successfully completing the course are L + T + P + D. **The credit pattern of the course is indicated as L: T: P:D.**

Different C**ourses of Study** are labeled and defined as follows:

a. Core Course:

A course which should compulsorily be studied by a candidate as a core-requirement is termed as a Core course. The CORE courses of Study are of THREE types, viz – (i)Foundation Course, (ii) Hard Core Course, and (iii) Soft Core Course.

b. Foundation Course (FC):

The foundation Course is a core course which should be completed successfully as a part of graduate degree program irrespective of the branch of study.

c. Hard Core Course (HC):

The **Hard Core Course** is a Core Course in the main branch of study and related branch(es) of study, if any that the candidates have to complete compulsorily.

d. Soft Core Course (SC):

A Core course may be a **Soft Core** if there is a choice or an option for the candidate to choose a course from a pool of courses from the main branch of study or from a sister/relatedbranch of study which supports the main branch of study.

e. O**pen Elective Course:**

An elective course chosen generally from other discipline / subject, with an intention to seek exposure to the basics of subjects other than the main discipline the student is studying is called an O**pen Elective Course.**

f. Project Work / Dissertation:

Project work is a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A project work carrying **FOUR or SIX** credits is called **Minor Project** work / **Dissertation.** A project work of **EIGHT, TEN, TWELVE or SIXTEEN** credits is called **Major Project** work / **Dissertation**. **A Minor Project work may be a hard core or a Soft Core as decided by the BOS / concerned. But the Major Project shall be Hard Core.**

3. Scheme, Duration and Medium of Instructions:

1. B Tech degree program is of 8 semesters - 4 years duration. A candidate can avail amaximum of 16 semesters - 8 years as per double duration norm, in one stretch to complete BTech degree, including blank semesters, if any. Whenever a candidate opts for blank semester, he/she has to study the prevailing courses offered by the School when he/she resumes his/her studies.
2. The medium of instruction shall be English

4. Minimum Credits to be Earned

4.1 **A candidate has to earn 192 credits for successful completion of B Tech degree** with the distribution of credits for different courses as prescribed by the university. A candidate can enroll for a maximum of 30 credits and a minimum of 20 credits per Semester. However he / she may not successfully earn a maximum of 30 credits per semester. This maximum of 30 credits doesnot include the credits of courses carried forward by a candidate.

4.2 **Only such full time candidates who register for a minimum prescribed number of credits in each semester from I semester to VIII semester and complete successfully 192 credits in 8 successive semesters shall be considered for declaration of Ranks, Medals, Prizes and are eligible to apply for Student Fellowship, Scholarship, Free ships, and such other rewards / advantages which could be applicable for all full time students and for hostel facilities**.

4.3. Add- on Proficiency Certification:

To acquire **Add on Proficiency Certification** a candidate can opt to complete a minimum of 4 extra credits either in the same discipline /subject or in different discipline / subject in excess to 192 credits for the B Tech Degree program.

4.3.1. Add on Proficiency Diploma:

To acquire **Add on Proficiency Diploma,** a candidate can opt to complete a minimum of 18 extra credits either in the same discipline /subject or in different discipline / subject in excess to 192 credits for the B Tech Degree program.

The A**dd on Proficiency Certification / Diploma** so issued to the candidate contains the courses studied and grades earned.

5. Continuous Assessment, Earning of Credits and Award of Grades.

5.1. The assessment and evaluation process happen in a continuous mode. However, for reporting purpose, **a semester is divided into 3 components as C1, C2, and C3.**

5.2. The performance of a candidate in a course will be assessed for a maximum of 100 marks as explained below.

a) Continuous assessment (C1 and C2) = 40 marks
b) Semester end (C3) examination = 60 marks

5.2.1 (i) Component C1:

The first Component (C1), of assessment is for 20 marks. This will be based on test,

assignment / seminar. During the first half of the semester (i.e. by 8th week), the first 50% of the syllabus (Unit 1&2) will be completed. This shall be consolidated during the first three days of 8th week of the semester. A review test based on C1 will be conducted and completed in the beginning of the 9th week. In case of courses where test cannot be conducted, the form of assessment will be decided by the concerned school and such formalities of assessment will be completed in the beginning of the 9th week. The academic sessions will continue for C2 immediately after completion of process of C1.

The finer split - up for the award of marks in C1 is as follows:

Assignment / Seminar .....5 marks for Unit 1&2

Review Test (Mid-Term) .....15 marks for Unit 1&2

Total .....20 marks

5.2.2 (ii) Component C2:

The second component (C2), of assessment is for 20 marks. This will be based on test, assignment /seminar. The continuous assessment and scores of second half of the semester (9th to 16th week) will be consolidated during 16th week of the semester. During the second half of the semester the remaining units in the course will be completed. A review test based on C2 will be conducted and completed during 16th week of the semester. In case of courses where test cannot be conducted, the form of assessment will be decided by the concerned school and such formalities of assessment will be completed during 16th week.

The 17th week will be for revision of syllabus and preparation for the semester - end examination.

The finer split - up for the award of marks in C2 is as follows:

Assignment / Seminar .....5 marks for Unit 3 & 4

Review Test (Mid-Term) .....15 marks for Unit 3 & 4

Total .....20 marks

5.2.3 The outline for continuous assessment activities for Component-I (C1) and Component-II (C2) will be proposed by the teacher(s) concerned before the commencement of the semester and will be discussed and decided in the respective School Board. The students should be informed about the modalities well in advance. **The evaluated courses/assignments during Component I (C1) and Component II (C2) of assessment are immediately returned to the candidates after obtaining acknowledgement in the register maintained by the concerned teacher for this purpose.**

5.2.4 (iii) Component C3:

The end semester examination of 3 hours duration for each course shall be conducted during the 18th & 19th week. **This forms the third / final component of assessment (C3) and the maximum marks for the final component will be 60.**

Valuation will be undertaken concurrently and results are announced latest by the end of 20th week. This practice will be followed both in odd semester and even semester.

5.3. Evaluation of Practical Courses

5.3.1 A practical examination shall be assessed on the basis of:

a) Knowledge of relevant processes;

b) Skills and operations involved;

c) Results / products including calculation and reporting.

5.3.2. In case a course is fully of P type (L=0:T=0:P=4), the performance of a candidate shall be assessed for a maximum of 100 marks as explained below:

a. Continuous assessment (C1 and C2) = 40 marks
b. Semester end (C3) practical examination = 60 marks

The 40 marks meant for continuous assessment shall further be allocated as under:

i	Conduction of regular practical throughout the semester	20 marks
ii	Maintenance of lab records	10 marks
iii	Performance of mid-term test	10 marks
	Total	**40 marks**

The 60 marks meant for Semester End (C3) Examination, shall be allocated as under:

i	Conduction of semester end practical examination	40 marks
ii	Write up about the experiment / practical conducted	10 marks
iii	Viva Voce	10 marks
	Total	**60 marks**

5.3.3 The C3 examination for Practical work will be conducted jointly by internal and external examiners. However, if external examiner does not turn up, then both the examiners will be

internal examiners.

In case a course is partly P type i.e., (L=3): (T=0) (P=1), then the examination for C3 component will be as decided by the BOS concerned.

5.3.4 The duration for semester-end practical examination shall be decided by the concerned School Board.

5.4. Evaluation of Minor Project / Major Project / Dissertation:

5.4.1. Right from the initial stage of defining the problem, the candidate has to submit the progress reports periodically and also present his/her progress in the form of seminars in addition to the regular discussion with the supervisor. At the end of the semester, the candidate has to submit final report of the project / dissertation, as the case may be, for final evaluation. The components of evaluation are as follows:

Component – I	(C1)	Periodic Progress and Progress Reports (25%)
Component – II	(C2)	Results of Work and Draft Report (25%)
Component– III	(C3)	Final Evaluation and Viva-Voce (50%). Evaluation of the report is for 30% and the Viva-Voce examination is for 20%.

6. Eligibility to Appear C3 (Semester - end) Examination

Only those students who fulfill a minimum of 75% attendance in aggregate of all the courses including practical courses / field visits etc, as part of the course(s), as provided in the succeeding sections, shall be eligible to appear for C3 examination.

7. Requirements to Pass the Semester and to Carry Forward the Failed Subjects / Courses:

7.1 Requirements to Pass a Course

A candidate's performance from all 3 components will be in terms of scores, and the sum of all three scores will be for a maximum of 100 marks (20 + 20 + 60; i .e, C1 + C2 + C3) and have to secure a minimum of 40% to declare pass in the course. However, a candidate has to secure a minimum of 25% (15 marks) in C3 which is compulsory.

7.2 Provision to Carry Forward the Failed Subjects / Courses:

The student who has failed in a maximum of 4 courses in odd and even semesters together shall move to next semester of immediate succeeding year of study. And he / she shall appear for C3

examination of failed courses of previous semesters concurrently with odd semester end examinations (C3) and / or even semester end examinations (C3) of current year of study.However, he / she shall have to clear all courses of both odd and even semesters of preceding yearto register for next succeeding semester.

Examples:-

a. Student "A" has failed in 1 Course in First Semester and 3 Courses in Second Semester. He / she is eligible to seek admission for Third Semester and appear for C3 examination of 1 failed Course of First Semester concurrently with Third Semester C3 examination. Likewise, he / she is eligible to appear for C3 examination of 3 failed Courses of Second Semester concurrently with Fourth Semester C3 examination. However, he / she has to clear all the failed Courses of First and Second Semesters before seeking admission to Fifth Semester.

b. Student "B" has failed in 2 Courses in Third Semester and 2 Courses in Fourth Semester and has passed in all Courses of First and Second Semesters. He / she is eligible to seek admission to Fifth Semester and appear for C3 examination of 2 failed Courses of Third Semester concurrentlywith Fifth Semester C3 examination. Likewise he / she is eligible to appear for C3 examination of 2 failed Courses of Fourth Semester concurrently with Sixth Semester C3 examination. However, he / she is not eligible to seek admission to Seventh Semester unless he / she passes in all the failed courses of Third and Fourth Semesters.

c. Student "C" has failed in 4 Courses in Fifth Semester but has cleared all the courses in Sixth Semester. He / She has also passed all the courses of First to Fourth Semesters. Student "C" is eligible to seek admission for Seventh Semester and appear for C3 examination of 4 failed Courses of Fifth Semester concurrently with Seventh Semester C3 examination. However, he / she has to pass all the failed courses of Fifth Semester along with Seventh and Eighth Semesters courses to earn B Tech Degree.

d. Student "D" passed in 1to 4 semesters, but failed in 3 courses of 5th Semester and in 1 course of 6th Semester. He / She has also passed all the courses of First to Fourth Semesters. Student "D" is also eligible to seek admission for 7th Semester and appear for C3 examination of 3 failed courses of 5th Semester concurrently with 7th Semester C3 examination and one failed course of 6th Semester concurrently with 8th Semester C3 examination. However, he / she has to pass allthe 3 failed courses of Fifth Semester and 1 course Sixth Semester along with Seventh and Eighth Semester courses to earn B Tech Degree.

7.3 Re-Registration and Re-Admission:

a) In case a candidate's class attendance in aggregate of all courses in a semester is less than 75% or as stipulated by the University, such a candidate is considered as dropped the semester and is not allowed to appear for end semester examination (C3) and he / she shall have to seek re- admission to that semester during subsequent semester / year within a stipulated period.

b) In case a candidate fails in more than 4 courses in odd and even semesters together in a given academic year (and is detained from moving to higher semester) he / she may opt to re-register either for the entire semester(s) or for such courses wherein, he / she has failed and repeat the semester(s) / courses. (However, such a candidate may also opt to re-appear during subsequent semester / year within a stipulated period, for C3 (semester end) examination to such of those courses that he /she has failed without re-registering).

c) In such a case where in a candidate drops all the courses in semester due to personal reasons, it is considered that the candidate has dropped the semester and he / she shall seek re-admission to such dropped semester.

8 Attendance Requirement:

8.1 All students must attend every lecture, tutorial and practical classes.

8.2 In case a student is on approved leave of absence (e g:- representing the university in sports, games or athletics, placement activities, NCC, NSS activities and such others) and / or any other such contingencies like medical emergencies, the attendance requirement shall be minimum of 75% of the classes taught.

8.3 Any student with less than 75% of attendance in aggregate of all the courses including practical courses / field visits etc, during a semester shall not be permitted to appear to the end semester (C3) examination and such student shall seek re-admission as provided in 7.8.4.

8.4 Teachers offering the courses will place the above details in the School Board meeting during the last week of the semester, before the commencement of C3, and subsequently a notification pertaining to the above will be brought out by the Director of the School before the commencement of C3 examination. A copy of this notification shall also be sent to the office of the Registrar & Registrar (Evaluation).

8.5 Absence during Mid Semester Examination:

In case a student has been absent from a mid-semester (C1 and C2) examination due to the illness or other contingencies he / she may give a request along with necessary supporting documents and certification from the concerned class teacher / authorized personnel to the concerned Head of the School, for make-up examination. The Head of the School may consider such request depending on the merit of the case and after consultation with course instructor and class teacher, and permit such student to appear for make-up mid semester (C1 and C2) examination.

9 Challenge Valuation:

a. A student who desires to apply for challenge valuation shall obtain a photo copy of the answer script by paying the prescribed fee within 10 days after the announcement of the results. He / She can challenge the grade awarded to him/her by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 10 days after the announcement of the results. This challenge valuation is only for C3 component.

b. The answer scripts for which challenge valuation is sought for shall be evaluated by the external examiner who has not involved in the first evaluation. The higher of two marks from first valuation and challenge valuation shall be the final.

10 Grade Card and Grade Point

10.1 **Provisional Grade Card**: The tentative / provisional grade card will be issued by the Registrar (Evaluation) at the end of every semester indicating the courses completed successfully. The provisional grade card provides **Semester Grade Point Average** (SGPA).

10.2 **Final Grade Card:** Upon successful completion of B Tech Degree a Final Grade card consisting of grades of all courses successfully completed by the candidate will be issued by the Registrar (Evaluation).

10.3 **The Grade and the Grade Point:** The Grade and the Grade Point earned by the candidate in the subject will be as given below.

Marks P	Grade G	Grade Point (GP=V x G)	Letter Grade
90>100	10	v*10	O
80>90	9	v*9	A+
70 > 80	8	v*8	A
60> 70	7	v*7	B+
55 > 60	6	v*6	B
50 > 55	5.5	V*5.5	C
40> 50	5	v*5	P
0-40	0	v*0	F
ABSENT			AB

O - Outstanding; A-Excellent; B-Very Good; C-Good; D-Fair; E-Satisfactory; F - Fail

Here, P is the percentage of marks (P=[(C1+C2)+M] secured by a candidate in a course which is **rounded to nearest integer**. V is the credit value of course. G is the grade and GP is the grade point.

10.3.1 Computation of SGPA and CGPA

The Following procedure to compute the Semester Grade Point Average (SGPA)

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student in a given semester, i.e. : **SGPA (Si) = ∑(Ci x Gi) / ∑Ci** where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

Illustration for Computation of SGPA and CGPA
Illustration No. 1

Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade)
Course 1	**4**	**A+**	**9**	**4X9=36**
Course 2	**4**	**A**	**8**	**4X8=32**
Course 3	**3**	**B+**	**7**	**3X7=21**
Course 4	**3**	**O**	**10**	**3X10=30**
Course 5	**3**	**P**	**5**	**3X5=15**
Course 6	**3**	**B**	**6**	**3X6=18**
Course 7	**2**	**O**	**10**	**2X10=20**
Course 8	**2**	**A**	**8**	**2X8=16**
	24			**188**

Thus, **SGPA = 188 ÷ 24 = 7.83**

Illustration No. 2

Course	Credit	Grade letter	Grade Point	Credit Point (Credit x Grade point)
Course 1	**4**	**A**	**8**	**4X8=32**
Course 2	**4**	**B+**	**7**	**4X7=28**
Course 3	**3**	**A+**	**9**	**3X9=27**
Course 4	**3**	**B+**	**7**	**3X7=21**
Course 5	**3**	**B**	**6**	**3X6=18**
Course 6	**3**	**P**	**5**	**3X5=15**
Course 7	**2**	**B+**	**7**	**2X7=21**
Course 8	**2**	**O**	**10**	**2X10=20**
	24			**175**

Thus, **SGPA = 175 ÷ 24 = 7.29**

Illustration No.3

Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade point)
Course 1	4	O	10	4 x 10 = 40
Course 2	4	A+	9	4 x 9 = 36
Course 3	3	B+	7	3 x 7 = 21
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	B+	7	3 x 7 = 21
Course 7	2	A+	9	2 x 9 = 18
Course 8	2	A+	9	2 x 9 = 18
	24			199

Thus**, SGPA = 199 ÷ 24 = 8.29**

10.4 Cumulative Grade Point Average (CGPA):

10.4.1 Overall Cumulative Grade Point Average (CGPA) of a candidate after successful completion of the required number of credits (192) for B. Tech degree in Engineering & Technology is calculated taking into account all the courses undergone by a student over all the semesters of a program, i. e : **CGPA = ∑(Ci x Si) / ∑Ci**

Where *Si* is the SGPA of the ith semester and *Ci* is the total number of credits in that semester.

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.
Illustration:

CGPA after Final Semester

Semester (ith)	No. of Credits (Ci)	SGPA (Si)	Credits x SGPA (Ci X Si)
1	24	6.83	24 x 6.83 = 163.92
2	24	7.29	24 x 7.29 = 174.96
3	24	8.11	24 x 8.11 = 192.64
4	26	7.40	26 x 7.40 = 192.4
5	26	8.29	26 x 8.29 = 215.54
6	24	8.58	24 x 8.58 = 205.92
7	24	9.12	24 x 9.12 = 218.88
8	24	9.25	24 x 9.25 =222
Cumulative	196		1588.26

Thus, **CGPA** = $\frac{24x6.83+24x7.29+24x8.11+26x7.40+26x8.29+24x8.58+24x9.12+24x9.25}{196}$ = 8.10

10.4.2 CONVERSION OF GRADES INTO PERCENTAGE:

Conversion formula for the conversion of CGPA into Percentage is:

Percentage of marks scored = CGPA Earned x 10

Illustration: CGPA Earned 8.10 x 10=81.0

10.5 Classification of Results

The final grade point (FGP) to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

CGPA	Grade (Numerical Index)	Letter Grade	Performance	FGP
	G			Qualitative Index
9 >= CGPA 10	10	O	Outstanding	Distinction
8 >= CGPA < 9	9	A+	Excellent	
7 >= CGPA < 8	8	A	Very Good	First Class
6 >= CGPA < 7	7	B+	Good	
5.5> = CGPA < 6	6	B	Above average	Second Class
> 5 CGPA < 5.5	5.5	C	Average	
> 4 CGPA <5	5	P	Pass	Satisfactory

Overall percentage=10*CGPA

11 Provision for Appeal

If a candidate is not satisfied with the evaluation of C1 and C2 components, he/she can approach the grievance cell with the written submission together with all facts, the assignments, test papers etc, which were evaluated. He/she can do so before the commencement of semester-end examination. The grievance cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if his/her submission is found to be baseless and unduly motivated. This cell may recommend taking disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the grievance cell is final.

For every program there will be one grievance cell. The composition of the grievance cell is as follows:-

- The Registrar (Evaluation) - Ex-officio Chairman / Convener
- One Senior Faculty Member (other than those concerned with the evaluation of thecourse concerned) drawn from the school / department/discipline and/or from the sister schools / departments/sister disciplines – Member.
- One Senior Faculty Members / Subject Experts drawn from outside the University school / department – Member.

12. With regard to any specific case of ambiguity and unsolved problem, the decision of the Vice-Chancellor shall be final.

TRAINING AND PLACEMENT

Having a degree will open doors to the world of opportunities for you. But Employers are looking for much more than just a degree. They want graduates who stand out from the crowd and exhibit real life skills that can be applied to their organizations. Examples of such popular skills employers look for include:

- Willingness to learn
- Self-motivation
- Team work
- Communication skills and application of these skills to real scenarios
- Requirement of gathering, design and analysis, development and testing skills
- Analytical and Technical skills
- Computer skills
- Internet searching skills
- Information consolidation and presentation skills
- Role play
- Group discussion, and so on

The REVA University therefore, has given utmost importance to develop these skills through variety of training programs and such other activities that induce the said skills among all students. A full-fledged Career Counseling, Training and Placement (CCTP) Centre headed by well experienced dynamic Trainer, Counselor and Placement Officer supported by an efficient team does handle all aspects of Internships and Placement for the students of REVA University. The prime objective of the CCTP Centre is to liaison between REVA graduating students and industries by providing a common platform where the prospective employer companies can identify suitable candidates for placement in their respective organization. The CCTP Centre organizes pre-placement training by professionals and also arranges expert talks to our students. It facilitates students to career guidance and improve their employability. In addition, CCTP Centre forms teams to perform mock interviews. It makes you to enjoy working with such teams and learn many things apart from working together in a team. It also makes you to participate in various student clubs which helps in developing team culture, variety of job skills and overall personality.

The need of the hour in the field of Engineering is efficient leaders of repute, who can deal the real time problems with a flavour of innovation. This kept in focus, the Training and Placement cell has designed the training process, which will commence from second semester along with the curriculum. Special coaching in personality development, career building, English proficiency, reasoning, puzzles, leadership, and strategic management and communication skills to every student of REVA University is given with utmost care. The process involves continuous training and monitoring the students to develop their soft skills including interpersonal skills that will fetch them a job of repute in the area of his/her interest and march forward to make better career.

Skill development is one of the very important activities of the University and Industry relationship.
A skill development centre is established to organize skill and certification programs. The students shall compulsorily complete at least two skill/certification based programs before the completion of the degree.

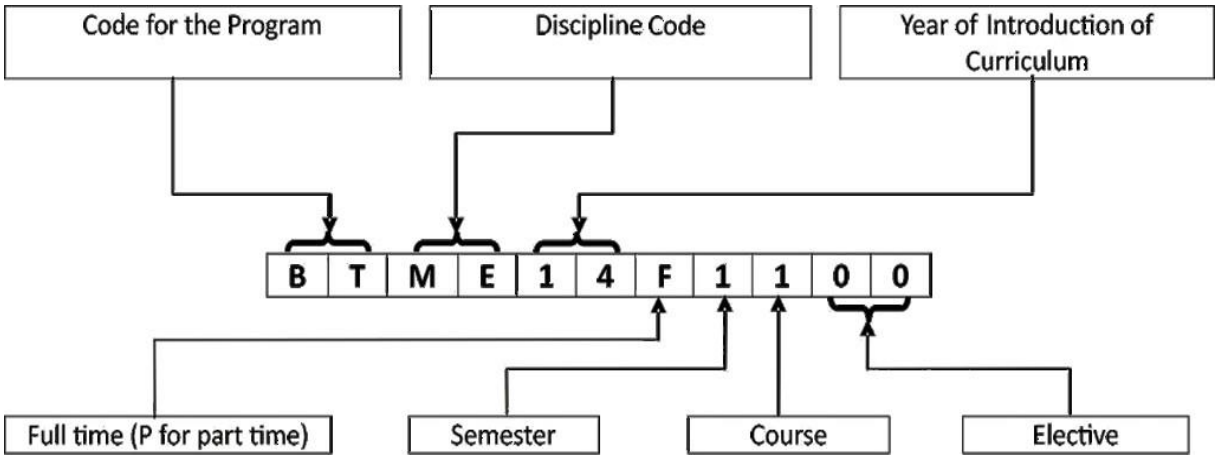
The University has collaborations with Industries, Corporate training organizations, research institutions and Government agencies like NSDC (National Skill Development Corporation) to conduct certification programs.

The various skill/certification programs identified are as follows.

- Big-data and Cloud Computing, Internet of Things (IOT), ORACLE, MYSQL, Advanced Java and Internals of LINUX/UNIX
- Red-hat certified programs on LINUX,
- Management related programs like SAP,ERP and Business Analytics
- Open Source software/hardware, Software Testing
- Advanced networking based CISCO / Microsoft technology.
- Web designing, System administration
- IBM certified programs.

The University has signed MOU's with Multi-National Companies, research institutions, Government agencies like NSDC (National Skill Development Corporation) and universities abroad to facilitategreater opportunities of employability, students' exchange programs for higher learning and for conducting certification programs.

Course Numbering Scheme



List of Codes for Programs and Disciplines / Branch of Study

Program Code	Title of the Program	Discipline Code	Name of the Discipline / Branch of Study
BA	Bachelor of Arts	AE	Advanced Embedded Systems
BB	BBM (Bachelor of Business Management)	AI	Advanced Information Technology
BC	B.Com (Bachelor of Commerce)	AP	Advanced Power Electronics
BR	B. Arch (Bachelor of Architecture)	CA	Computer Aided Structural Engineering
BS	B Sc, BS (Bachelor of Science)	CE	Civil Engineering
BT	B.Tech (Bachelor of Technology)	CH	Chemistry
BP	Bachelor of Computer Applications	CO	Commerce
BL	LLB (Bachelor of Law)	CS	Computer Science and Engineering / Computer Science
MA	Master of Arts	DE	Data Engineering and Cloud Computing
MB	MBA (Master of Business Administration)	EC	Electronics and Communication Engineering
MC	M.Com (Master of Commerce)	EN	English
MS	M.Sc / MS (Master of Science)	MD	Machine Design and Dynamics
MT	M Tech (Master of Technology)	ME	Mechanical Engineering
MC	Master of Computer Applications	EE	Electrical & Electronics Engineering

Scheme of Instruction and Syllabus
B.Tech – Electrical & Electronics Engineering

I Semester Physics Cycle

SL	Course Code	Title of the Course	HC/SC/OE	Credit Pattern & Credit Value				CH	Teaching School/Dept.
				C	L	T	P		
1	BTEM15F1100	Engineering Mathematics - I	HC	4	3	1	0	5	Mathematics
2	BTEP15F1200	Engineering Physics	HC	3	2	1	0	4	Physics
3	BTCV15F1300	Elements of Civil Engineering	HC	3	2	1	0	4	Civil
4	BTME15F1400	Elements of Mechanical Engineering	HC	3	2	1	0	4	MECH
5	BTEE15F1500	Basic Electrical Engineering	HC	3	2	1	0	4	EEE
6	BTIC15F1600	Indian Constitution and Professional Ethics	FC	2	1	1	0	3	Law
7	BTCE17F1700	Technical English I	FC	2	1	1	0	3	Humanities
8	BTPL15F1800	Physics Lab	HC	2	1	0	1	3	Physics
9	BTEC15F1900	Basic Electrical Engineering lab	HC	2	1	0	1	3	EEE
TOTAL CREDITS				**24**	**15**	**7**	**2**	**33**	

II Semester Chemistry Cycle

SL	Course Code	Title of the Course	HC/SC/OE	Credit Pattern & Credit Value				CH	Teaching School/Dept.
				C	L	T	P		
1	BTEM15F2100	Engineering Mathematics – II	HC	4	3	1	0	5	Mathematics
2	BTEC15F2200	Engineering Chemistry	HC	3	2	1	0	4	Chemistry
3	BTBE15F2300	Basic Electronics Engineering	HC	3	2	1	0	4	ECE
4	BTCC15F2400	Computer Concepts & C Programming	HC	3	2	1	0	4	CSE
5	BTES15F2500	Environmental Sciences	FC	2	1	1	0	3	Civil
6	BTTC17F2600	Technical English II	FC	2	1	1	0	3	Humanities
7	BTED15F2700	Computer Aided Engineering Drawing	HC	4	2	0	2	6	MECH
8	BTCL15F2800	Engineering Chemistry Lab	HC	2	1	0	1	3	Chemistry
9	BTCP15F2900	Computer Concepts and C programming Lab	HC	2	1	0	1	3	CSE
TOTAL CREDITS				**25**	**15**	**6**	**4**	**35**	

III Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F3100	Engineering Mathematics–III	HC	4	3	1	0	5
2	BTEE15F3200	Electrical Circuit Theory- I	HC	3	2	1	0	4
3	BTEE15F3300	Electrical &Electronic Instrumentation and Measurements	HC	3	2	1	0	4
4	BTEE15F3400	Electrical Power Generation	HC	4	3	1	0	5
5	BTEE15F3500	Analog Electronic Circuit Design	HC	3	2	1	0	4
6	BTEE15F3600	Digital Electronic Circuit Design	HC	3	2	1	0	4
7	BTEE15F3700	Analog Electronic Circuit Design Laboratory	HC	2	1	0	1	3
8	BTEE15F3800	Digital Electronic Circuit Design Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**24**	**16**	**6**	**2**	**32**

IV Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F4100	Engineering Mathematics – IV	HC	4	3	1	0	5
2	BTEE15F4200	Electrical Circuit Theory- II	HC	3	2	1	0	4
3	BTEE15F4300	Electromagnetic Theory	HC	3	2	1	0	4
4	BTEE15F4400	Electrical Machines I	HC	3	2	1	0	4
5	BTEE15F4500	Microcontrollers and Applications	HC	3	2	1	0	4
6	BTEE15F4600	Power Electronics	HC	3	2	1	0	4
7	BTEE15F4700	Microcontroller Laboratory	HC	2	1	0	1	3
8	BTEE15F4800	Power Electronics Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**23**	**15**	**6**	**2**	**31**

V Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F5100	Control Engineering	HC	3	2	1	0	4
2	BTEE15F5200	Transmission and Distribution	HC	4	3	1	0	5
3	BTEE15F5300	Signals and Systems	HC	3	2	1	0	4
4	BTEE15F5400	Electrical Machines II	HC	3	2	1	0	4
5	BTEE15F5501	Electrical Power Utilization	SC	4	3	1	0	5
	BTEE15F5502	Electrical Drives						
	BTEE15F5503	Digital system design using VHDL						
	BTEE15F5504	Computer Networks Concepts and Protocols						
6	BTEE15F5601	Design of Electrical Machines	SC	4	3	1	0	5
	BTEE15F5602	Advanced Power Electronics						
	BTEE15F5603	Programmable Logic Controllers						
	BTEE15F5604	Programming in Java						
7	BTEE15F5700	Electrical Machines Laboratory I	HC	2	1	0	1	3
8	BTEE15F5800	Electrical and Electronics Measurements Lab.	HC	2	1	0	1	3
TOTAL CREDITS				**25**	**17**	**6**	**2**	**33**

VI Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F6100	Power System Analysis	HC	4	3	1	0	5
2	BTEE15F6200	High Voltage Engineering	HC	4	3	0	1	5
3	BTEE15F6300	Theory and Applications of Linear Integrated Circuits	HC	3	2	1	0	4
4	BTEE15F6401	Advanced Control Engineering	SC	3	2	1	0	4
	BTEE15F6402	Digital Relays						
	BTEE15F6403	Embedded systems and IOT						
	BTEE15F6404	Computer Organization and Architecture						
5	BTEE15F6501	Power System Planning and Reliability	SC	3	2	1	0	4
	BTEE15F6502	Modeling and Simulation of Electrical Machines						
	BTEE15F6503	Operation Research						
	BTEE15F6504	Web Programming						
6	BTEE15F6601	Smart grid	SC	4	3	1	0	5
	BTEE15F6602	Digital Signal Processing						
	BTEE15F6603	VLSI Circuits and Design						
	BTEE15F6604	Data Structures using C++						
7	BTEE15F6700	Electrical Machines Laboratory II	HC	2	1	0	1	3
8	BTEE15F6800	Control System Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**25**	**19**	**5**	**3**	**33**

VII Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F7100	Computer Aided Power System Analysis and Stability	HC	4	3	1	0	5
2	BTEE15F7200	CAED	HC	4	3	1	0	5
3	BTEE15F7300	Project Phase I	HC	2	0	1	1	4
4	BTEE15F7401	Power System Protection	SC	4	3	1	0	5
	BTEE15F7402	HVDC						
	BTEE15F7403	Industrial Instrumentation and Automation						
	BTEE15F7404	Operating system						
5	BTEE15F7501	Testing and Commissioning of Electrical Equipment	SC	4	3	1	0	5
	BTEE15F7502	Electricity Regulations						
	BTEE15F7503	Non Conventional Energy Sources						
	BTEE15F7504	Fuzzy logic system						
6	-	Open Elective subject offered by other school	OE	4	3	1	0	5
7	BTEE15F7700	Relay and High Voltage Laboratory	HC	2	1	0	1	3
8	BTEE15F7800	Power System Simulation Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**26**	**17**	**6**	**3**	**35**

VIII Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F8100	Project Phase II	HC	8	0	1	7	16
2	BTEE15F8201	Operation and Control of Power Systems	SC	4	3	1	0	5
	BTEE15F8202	Introduction to Flexible AC transmission system						
	BTEE15F8203	Estimation and Design of Electrical Installation						
	BTEE15F8204	Artificial Neural Network						
3	BTEE15F8301	Electrical Power Quality	SC	4	3	1	0	5
	BTEE15F8302	Electrical Distribution system						
	BTEE15F8303	Electrical Safety						
4	BTEE15F8401	Management & Entrepreneurship	SC	4	3	1	0	5
	BTEE15F8402	Electrical Energy Conservation						
	BTEE15F8403	Computer Control of Electric drives						
	BTEE15F8404	Trouble Shooting of Common Electrical Appliances						
TOTAL CREDITS				**20**	**9**	**4**	**7**	**31**

Credit Distribution

SL.No	Semester	Credits				
		HC	FC	SC	OE	Total
1	I	20	04	-	-	24
2	II	21	04	-	-	25
3	III	24	-	-	-	24
4	IV	23	-	-	-	23
5	V	17	-	8	-	25
6	VI	15	-	10	-	25
7	VII	14	-	8	04	26
8	VIII	08	-	12	-	20
Grand Total		**142**	**08**	**38**	**04**	**192**

Detailed Syllabus of B Tech in Electrical and Electronics Engineering

I Semester Physics Cycle

Sub Code: BTEM15F1100	Engineering Mathematics – I	C	L	T	P	CH
Duration : 14 Wks		4	3	1	0	5
Prerequisites:	Knowledge of basics limits, continuity, differentiation, integration, matrices, determinants, and geometry.					
Course Objectives	1. To understand the concepts of differential calculus and its applications. 2. To familiarize with partial differentiation and its applications in various fields. 3. To familiarize with linear algebraic applications and different reduction techniques. 4. To familiarize with concept of vector calculus and its applications.					
Course Outcomes	After the completion of the course the student will be able to: 1. Apply the knowledge of differential calculus in the field of wave theory and communication systems. 2. Apply the knowledge of Differential Equations in the field of Engineering. 3. Analyze and implement the concepts of Divergence and curl of vectors which play significant roles in finding the Area and volume of the closed surfaces. 4. Apply the knowledge of convergence of the series, which help in forming JPEG image compression. 5. To determine whether a sequence or a series is convergent or divergent and evaluate the limit of a convergent sequence or the sum of a convergent series.					

Course Contents

UNIT-I Differential Calculus-I **[14 hr]**

Successive differentiation-nth derivatives (proof and problems), Leibnitz Theorem (without proof) and problems, Taylors series and Maclaurins series expansion for one variable (only problems), Polar curves- Angle between the radius vector and tangent, angle between two curves, Pedal equation for polar curves.

UNIT-II Differential Calculus-II **[14 hr]**

Derivative of arc length – concept and formulae without proof, Radius of curvature-Cartesian, parametric, polar and pedal forms (without proof) problems.

Indeterminate forms and solution using L'Hospital's rule.

Partial Differentiation: Partial derivatives-Euler's theorem-problems, Total derivative and chain rule,

UNIT-III Differential Calculus-III and Differential equations [14 hr]

Jacobians-definition and problems (only find *J*and*reference- one example on JJ'=1). Taylor's Expansion of function of two variables (only problems- up to 2nd order).

Maxima and Minima for a function of two variables (simple problems).

Differential equations: Exact equation and reducible to exact form (1. Close to expression M or N and find IF, 2. y f(x) dx+x g(y) dy)

UNIT-IV Integral Calculus [14 hr]

Reduction formulae for the integrals of $\sin^n x, \cos^n x, \sin^m x \cos^n x$ and evaluation of these integrals with standard limits(direct result) - Problems.

Multiple Integrals – Double integrals, change of order of integration (simple problems), and triple integrals. Beta and Gamma functions (definition),(properties and duplication formula - without proof), Relation between beta and gamma function and simple problems.

Text books:

1. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 43nd edition, 2015.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Publications, 10th edition, 2015.

Reference Books:

1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Publications, 19th Edition, 2013.
2. R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House, 5th edition, 2014.

Sub Code: BTEP15F1200	Engineering Physics	C	L	T	P	CH
Duration : 14 Wks		3	2	1	0	4
Prerequisites:	Basic knowledge of physics of pre-university					
Course Objectives	1. To provide the students the fundamentals of Physics and make their basic foundation in engineering education very strong. 2. To expose the students of different branches of engineering with a theoretical and practical knowledge of Engineering Physics 3. To prepare students and make them ready to take up higher semester core engineering subjects by giving them strong physics background. 4. Students should be getting knowledge of different physical systems, basic quantum mechanics and materials science etc.					
Course Outcomes	On completion of this course the student will be able to: 1. Apply knowledge of physics to different systems and analyze different problems. 2. Understand the need of quantum mechanics and its importance and applications 3. Get the knowledge to explain electrical conductivity of materials. 4. Get exposed to recent trends in nanoscience and technology. 5. Understand and demonstrate different applications of lasers, optical fibers, superconductors etc.					

Course Contents

UNIT-I Wave mechanics: [14 hr]

Introduction to Wave mechanics, Wave particle dualism. de-Broglie hypothesis, Matter waves and their characteristic properties. Expression for de-Broglie wavelength of an electron in terms of accelerating potential. Phase velocity and group velocity, Relation between phase velocity and group velocity. Relation between group velocity and particle velocity, Expression for de-Broglie wavelength using the concept of group velocity. Heisenberg's uncertainty principle, its significance and its applications (nonexistence of electron inside the nucleus). Wave function, properties of wave function and physical significance. Probability density and Normalization of wave function, Schrodinger time- dependent and independent wave equation, Eigen values and Eigen functions. Applications of Schrödinger wave equation – energy Eigen values of a free particle, Particle in one dimensional infinite potential well. Numerical.

UNIT-II Lasers and optical fibers: [14 hr]

Lasers Interaction between radiation and matter (induced absorption, spontaneous and stimulated emission). Expression for energy density at thermal equilibrium in terms of Einstein'scoefficients. Characteristics of laser light, Conditions for laser operation (population inversion and Meta stable state). Requisites of laser system, Construction and working of Carbon Dioxide (CO_2) laser & semiconductor laser. Applications: Holography (recording and reconstruction of images) and its applications, Numerical.

Optical fibers: Construction and light propagation mechanism in optical fibers (total internal reflection and its importance), Acceptance angle, Numerical Aperture (NA), Expression for numerical aperture in terms of core and cladding refractive indices, Condition for wave propagation in optical fiber, V-number and Modes of propagation, Types of optical fibers, Attenuation and reasons for attenuation, Applications: Explanation of optical fiber communication using block diagram, Optical source (LED) and detector (Photodiode). Advantages and limitations of optical communications, Numerical.

UNIT-III Electrical properties of conductors and superconductors: [14 hr]

Electrical Conductivity in Metals, Drude-Lorentz classical free electron theory, drift velocity, mean free path, mean collision time and relaxation time. Expression for electrical conductivity in metals, Effect of impurity and temperature on electrical resistivity in metals, Failures of classical free electron theory. Quantum free electron theory, Fermi-Dirac statistics, Fermi level, Fermi energy and Fermi factor, Variation of Fermi factor with energy and temperature, Density of states (qualitative explanation), effective mass, Merits of Quantum free electron theory, Numerical.

Superconductors: Temperature dependence of resistivity in superconductors, variation of critical field with temperature, Properties of superconductors (Isotope effect, Meissner effect, Silsbee effect), Types of superconductors, BCS theory, Applications of super conductors, Maglev vehicle and superconducting magnet.

UNIT-IV Ultrasonics, Dielectric and Nanomaterials: **[14 hr]**

Ultrasonics: Production of ultrasonics by piezoelectric method, Measurement of velocity of ultrasonics in solid and liquid, Non-destructive testing of materials using ultrasonics.

Dielectric materials: Electric dipole and dipole moment, electric polarization (P), dielectric susceptibility (χ,), dielectric constant, relation between χ and P, Electrical polarization

mechanisms (electronic, ionic, orientational, space charge polarization), Expression for internal field in one- dimensional solid dielectrics, Ferro, Piezo and Pyro electric materials – theirproperties and applications, Numericals.

Nanomaterials: Introduction to nanoscience, nanomaterials and their applications, Synthesis of nano materials using bottom-up method (arc method), top-down methods (ball milling method), Carbon Nanotubes: properties and applications.

Text books:

1. Engineering Physics, R.K Gaur and S.L. Gupta, Dhanpat Rai Publications(P) Ltd, New Delhi.
2. A text book of Engineering Physics, M.N. Avadhanulu and P.G. Kshirsagar, S. Chand and Company, New Delhi.
3. Solid State Physics, S.O. Pillai, New Age International publishers, New Delhi.

Reference Books:

1. Laser Fundamentals, William T. Silfvast, 2nd Edition, Cambridge University press, New York (2004).
2. Fundamentals of Physics, 6th Edition, D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, New York (2001).
3. Introduction to Solid State Physics,7th Edition Charls Kittel, Wiley, Delhi (2007).
4. Arthur Beiser, Concepts of modern Physics, Tata McGraw Hill publications, New Delhi.

Sub Code: BTCV15F1300	**Elements of Civil Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		3	2	1	0	4
Course Objectives	1. To enable students to establish a broad concept of engineering mechanics. 2. To enable students to understand the basics of composition of coplanar forces. 3. To enable students to understand the concept of equilibrium of coplanar forces. 4. To provide an overview of centroid of plane area & Moment of Inertia of plane area.					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the moment of force and couples and equivalent force-couple system. 2. Solve numerical problems on composition of coplanar concurrent and non-concurrent force system. 3. Solve numerical problems on equilibrium of coplanar force system. 4. Locate the centroid and moment of inertia of different geometry.					

Course Contents

UNIT-I: Engineering mechanics **[14 hr]**

Introduction to basic civil engineering – Scope of civil engineering, role of civil engineer, branches of civil engineering (brief discussion 2 to 3 hours only)

Engineering mechanics

Basic idealizations - Particle, Continuum and Rigid body; Force and its characteristics, types of forces, Classification of force systems; Principle of physical independence of forces, Principle of superposition of forces, Principle of transmissibility of forces; Newton's laws of motion, Introduction to SI units, Moment of a force, couple, moment of a couple, characteristics of couple, Equivalent force - couple system, Resolution of forces, composition of forces; Numericalproblems on moment of forces and couples and equivalent force - couple system.

UNIT-II Analysis of Force Systems **[14 hr]**

Composition of forces - Definition of Resultant, Composition of coplanar -concurrent force system, Parallelogram Law of forces, Principle of resolved parts, Numerical problems on composition of coplanar concurrent force systems, Composition of coplanar - non-concurrent force system, Varignon's principle of moments; Numerical problems on composition of coplanar concurrent force systems.

UNIT-III Equilibrium of coplanar forces **[14 hr]**

Definition of static equilibrium and Equilibrant, Conditions of static equilibrium for different coplanar force systems, Lami's theorem, Concept of Free Body Diagram, Numerical problems on equilibrium of coplanar – concurrent and non-concurrent force systems.

UNIT-IV Centroid and Moment of Inertia **[14 hr]**

Centroid: Introduction to the concept, Centroid of plane figures, Locating the centroid oftriangle, semicircle, quadrant of a circle and sector of a circle using method of integration, Centroid of composite sections; Numerical problems.

Moment of Inertia: Introduction to the concept, Rectangular and polar moment of inertia, Radius of gyration, Perpendicular axis theorem and Parallel axis theorem, Moment of Inertia of

rectangle, circle, semi-circle, quarter circle and triangle from method of integration, Moment of inertia of composite areas, Numerical problems.

Text Books:

1. M. N. Shesha Prakash and Ganesh B. Mogaveer, **"Elements of Civil Engineering and Engineering Mechanics"**, PHI Learning, 3rd Revised edition
2. A. Nelson, **"Engineering Mechanics-Statics and Dynamics"**, Tata McGrawHill Education Private Ltd, New Delhi, 2009
3. S. S. Bhavikatti, **"Elements of Civil Engineering"**, New Age International Publisher, New Delhi, 3rd edition 2009.

Reference Books:

1. S. Timoshenko, D.H. Young and J.V. Rao, **"Engineering Mechanics"**, TATA McGraw-Hill Book Company, New Delhi
2. Beer FP and Johnston ER, **"Mechanics for Engineers- Dynamics and Statics"**, 3rd SI Metric edition, Tata McGraw Hill. - 2008
3. Shames IH, **"Engineering Mechanics–Statics & Dynamics"**, PHI–2009.

Sub Code: BTME15F1400	**Elements of Mechanical Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		3	2	1	0	4
Course Objectives	1. To develop the basic knowledge of working of various turbines and IC engines 2. To incorporate the concepts of metal joining process, their applications and power transmission modes like belt drives, gears and gear trains 3. To understand various mechanical machines and operations. 4. Introduce about lubrication and its importance. 5. To understand basic power transmission concepts.					
Course Outcomes	The student will be able to 1. Apply the concepts of working principle of turbines in the power plants and also of the IC engines in the basic design of the vehicles 2. Have a basic knowledge of metal joining and power transmission and apply them in some basic requirements 3. Gain the knowledge about machine tools and cutting operations. 4. Gain the knowledge about belt and gear drive power transmission.					

Course Contents

UNIT–I **[14 hr]**

Properties of steam - Introduction**,** Steam formation, Types of steam. Steam properties, Specific Volume, Enthalpy and Internal energy, Steam table and simple numerical problems

Steam Generators – classification, Lancashire boiler, Babcock and Wilcox boiler, Boiler mountings, accessories and applications

Turbines- Introduction to turbines & prime movers, Classification of turbines, Working principle and applications of impulse and reaction steam turbines, gas turbines (open and closed cycle type) and water turbines (Peloton wheel, Francis and Kaplan), Compounding of impulse turbine

UNIT–II **[14 hr]**

Internal Combustion Engines – Introduction, Classification of IC engines, parts of IC engine, Working principle of four stroke (petrol and diesel) and two stroke petrol engines, differences between 4 Stroke & 2 Stroke engines and petrol & diesel engines, Numerical problems on power and efficiencies.

Refrigeration and Air conditioning- Introduction, Principle of refrigeration, parts ofrefrigerator, Principle and working of vapor compression refrigeration and vapor absorption refrigeration. Refrigerants, Properties of refrigerants, Refrigerating effect, Ton of Refrigeration, COP, Relative COP, UNIT of Refrigeration, Principle and applications of Room air conditioners.

UNIT–III **[14 hr]**

Machine Tools- Introduction, working principle and classification of lathe, drilling and milling machines, major parts of a lathe and their functions, lathe operations on lathe - Specifications of lathe, parts of radial drilling machines, drilling operations, parts of horizontal milling machines, milling operations.

Metal joining processes- Introduction, classification of metal joining processes, method of welding (Electric Arc welding), soldering and brazing and their differences.

UNIT-IV **[14 hr]**

Lubrication- Necessity, types of lubrications, properties of good lubricant.

Bearings- Classification and application of bearings only.

Power Transmission- Introduction to transmission systems and its classification, types of Belt Drives**,** Definitions of Velocity ratio, angle of contact Creep and slip, Idler pulley, stepped pulley, fast & loose pulley, simple problems.

Gears - Definitions, Spur gear terminology, Types and applications of Gears.

Gear Trains – Simple and compound gear trains, Simple problems on gear trains.

Text Books:

1. A Text Book of Elements of Mechanical Engineering – K.R. Gopalkrishna, Subhash Publishers, Bangalore.
2. Elements of Mechanical Engineering – Kestoor Praveen and M.R. Ramesh 2nd Edition 2011, Suggi Publications

Reference Books:

1. The Elements of Workshop Technology - Vol. I & II , SKH Chowdhary, AKH Chowdhary , Nirjhar Roy, 11th edition 2001, Media Promotors and Publishers, Mumbai.

Sub Code: BTEE15F1500	**Basic Electrical Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		3	2	1	0	4
Course Objectives	1. To establish a broad concept of various types of generation of electricity. 2. To make students understand the basics of representation of electrical quantities and relationship among them. 3. To provide an overview of various types of electrical apparatus. 4. To introduce the concept of domestic wiring and importance of safety and sensing devices. 5. To provide an insight into various sources of power generation.					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the operation and control of various types of generation of electricity 2. Describe the principle of operation of electrical apparatus 3. Differentiate between single and three phase systems 4. Solve simple mathematical relationships related to electrical apparatus. 5. Relate the applications of electronic devices and sensors in practical life.					

Course Contents

UNIT-I Introduction to Electrical Parameters [14 hr]

Concept of Alternating Voltage and Current, Sinusoidal functions-specifications, Phasor representation, concept of impedance, admittance, conductance and susceptance –series and parallel circuits of RLC. Concept of power and power factor. Kirchoff's laws and network solutions. Electromagnetic induction-laws, direction & magnitude of induced emf, mmf, permeability, reluctance and comparison of electric and magnetic circuits. Self and mutual inductance of a coil, coupling coefficients. Concept of energy storage in L & C, resonance between L &C. Generation of three phase voltages, star-Wye configurations, relation between line and phase quantities and expression for power.

UNIT-II Electrical Apparatus [14 hr]

DC generator, DC motor- concept of force, torque and mechanical work. Single and three phase induction motors, shaded pole motor, universal motor, stepper motor: Basic construction, principle of operation and applications. Single and three-phase transformers: Principle, emfequation.

UNIT-III Generation & Distribution: [14 hr]

Block diagram representation of generation, transmission and distribution. Current generation and transmission scenario, need for transmission at high voltage. Block diagram representation of thermal, hydel, nuclear, diesel and renewable power plants. Concept of smart-grid and role of ICT in smart-grid.

UNIT-IV Tariff, Protective Devices and Sensors [14 hr]

Tariff schemes, basic concepts of domestic wiring and types, earthing, protective fuses, MCB. Sensors: pressure sensor, strain gage, proximity sensor, displacement sensor, rotary encoder and ultrasonic sensors (applications in relevant disciplines- ref to 8 and 9)

References:

1. Theodore Wildi, "Electrical Machines, Drives, and Power Systems", Pearson Education, 5th Edition, 2007
2. Hughes, "Electrical Technology", International Students 9th Edition, Pearson, 2005
3. Kulshreshtha C, "Basic Electrical Engineering" Tata McGraw Hill, 2nd Edition, 2011

4. Mittle V.N. and A. Mittal, "Basic Electrical Engineering" Tata McGraw Hill, 2nd Edition, 2005
5. Kothari D.P., L.J. Nagrath "Basic Electrical Engineering", Tata McGraw Hill, 2009
6. Robert L. Boylestad and Louis Nashelsky, "Introduction to Electricity, Electronics and Electromagnetics" Prentice Hall, 5th edition, 2001
7. Introduction to smart grid: http://www.occ.ohio.gov/publications/electric/Smart_Grid_An_Introduction.pdf
8. Role of ICT in smart grid: http://users.atlantis.ugent.be/cdvelder/papers/2010/develder2010sgc.pdf
9. Sensors: http://www.omron-ap.co.in/technical_guide/
10. Strain gage with bridge circuit: http://www.facstaff.bucknell.edu/mastascu/elessonshtml/Sensors/StrainGage.htm#SensorsInVoltageDividerCircuits

Sub Code: BTIC15F1600	**Indian Constitution and Professional Ethics**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		2	1	1	0	3
Prerequisites	Pre-university level Constitution of India and Professional Ethics					
Course Objectives	1. To provide and gain knowledge on Constitution of India. 2. To know and understand about the Fundamental Rights, Duties and other Rights which is been given by our law. 3. To prepare students in the practicality of Constitution perspective and make them face the world as a bonafide citizen. 4. To attain knowledge about ethics and also know about professional ethics. 5. Explore ethical standards followed by different companies.					
Course Outcomes	On completion of this course the student will be able to: 1. Strengthen the knowledge on Indian constitutional law and make the practical implementation of it. 2. Understand the fundamental rights and human rights. 3. Get the knowledge to explain the duties and more importantly practise it in a right way. 4. Adopt the habit of raising their voice against a non constitutionality of any laws and upon any legal discrimination as we have session of debates on Constitutional validity. 5. Get exposed about professional ethics and know about etiquettes about it. 6. Know about ethical standards of different companies which will increase their professional ability.					

Course Contents

UNIT-I Constitution of India **[8 hr]**

Definition, Making of Indian Constitution, Preamble to the Constitution of India, Fundamental Rights under Part III; Rights to Equality, Right to Freedom, Right against Exploitation, Rights to Freedom of Religion, Cultural and Educational Rights, Constitutional Remedies. Fundamental Duties of the Citizen, Significance and Characteristics. Elements of National Significance; National Flag, National Anthem, National Emblem.

UNIT-II Union and State: **[8 hr]**

Organs of the Government; Legislature, Executive and Judiciary. Union and State Executives: President, Vice President, Prime Minister, Supreme Court, Cabinet, Governor, Council of Ministers, Electoral process, Election Commission. Right to Information (RTI), Consumer and Consumer Protection.

UNIT III Ethics: **[8 hr]**

Meaning, Definition, Evolution, Need of ethics,Aristotlean Ethics, Utilitarianism, Katianism, Professional Ethics, Personal Ethics and Business Ethics, Ethical Standards, Duties of Employers and Employees.

UNIT IV Engineering Ethics: **[8 hr]**

Definition Scope and needs, Ethics in Consumer Protection, Due Care theory, Environmental Ethics, Ethical Code of Conduct in ethics. Best Ethical Companiesin India and Abroad; Corporate Social Responsibilities, Code of Conduct and Ethical Excellence.

Reference books:

1. M V Pylee, An introduction to Constitution of India.
2. M Govindarajan, S Natarajan, V S Senthil Kumar, Engineering.

Sub Code: BTCE17F1700	**Technical English I**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		2	1	1	0	3
Course Objectives	1. To enable learners of Engineering and Technology develop their basic communication skills in English.					

	2. To emphasize specially the development of listening and reading skills among learners of Engineering and Technology. 3. To equip them with writing skills needed for academic as well as workplace context. 4. To ensure that learners use the electronic media such as internet and supplement the learning materials used in the classroom.
Course Outcomes	On completion of the course, learners will be able to: 1. Listen/view and comprehend different spoken discourses/excerpts in different accents. 2. Speak clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies. 3. Read different genres of texts adopting various reading strategies. 4. Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic.

Course Outline:
This is a 2 credit course for first semester consisting of 4 hours of teaching learning per week, inclusive of direct classroom teaching and practice in language lab.

Course Contents

Unit	Description	Evaluation Pattern	Topics	Teaching Hours
I	Communicative Skills & Functional English	**25 Marks** Fill in the blanks/ MCQs/ Short Notes/ Descriptive Answers	1. Basics of Communication 2. Verbal & Non-verbal Communication 3. Barriers to Effective Communication 4. Strategies of Effective Communication 5. Tenses 6. Conditional Sentences 7. Auxiliaries (Modal & Primary)	16 Hours
II	Listening & Reading Skills	**25 Marks** Short Notes/ Descriptive Answers/ Comprehension Tasks	1. Definitions (Listening & Reading) 2. Types of Listening 3. Barriers to Effective Listening 4. Traits of a Good Listener 5. Types of Reading 6. Techniques of Effective Reading 7. Reading Tasks (Critical & Inferential)	16 Hours

III	Academic Writing – I	**25 Marks** Short Notes/ Descriptive Answers	1. Paragraphs 2. Notice/ Agenda/ Minutes 3. Note Taking/ Note Making 4. Summarizing 5. Project Reports	16 Hours
IV	ICT/ Digital/ E-Skills	**25 Marks** Short Notes/ Descriptive Answers	1. Computer Assisted Language Learning (CALL) 2. Mobile Assisted Language Learning (MALL) 3. Emails 4. Blogs 5. Digital/ E-Portfolio 6. Filling Online Application Forms	16 Hours

References:

1. Green, David. *Contemporary English Grammar Structures and Composition*. New Delhi: MacMillan Publishers, 2010.
2. Thorpe, Edgar and Showick Thorpe. *Basic Vocabulary*. Pearson Education India, 2012.
3. Leech, Geoffrey and Jan Svartvik. *A Communicative Grammar of English*. Longman, 2003.
4. Murphy, Raymond. *Murphy's English Grammar with CD*. Cambridge University Press, 2004.
5. Rizvi, M. Ashraf. *Effective Technical Communication*. New Delhi: Tata McGraw-Hill, 2005.
6. Riordan, Daniel. Technical Communication. New Delhi: Cengage Publications, 2011.
7. Sen et al. Communication and Language Skills. Cambridge University Press, 2015.

Sub Code: BTPL15F1800	**Engineering Physics Lab**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		2	1	1	0	3
Course Objectives	1. To make the students gain practical knowledge of Physics to co- relate with the theoretical studies. 2. To provide students with a theoretical and practical knowledge of Physics. 3. To achieve perfectness in experimental Skills and the study of practical applications improve confidence and ability to develop and fabricate engineering and technical equipments. 4. Students should be getting idea of basic electronic circuits, optical instruments and will be able to carry out experiments in optics and verify other important laws of Physics.					
Course Outcomes	At the end of the course a students are able to 1. Develop skills to apply practical knowledge of Physics in real time solution. 2. To understand and verify different laws of Physics using some simple experiments.					

	3. To design simple electrical circuits and analyze obtained result. 4. Ability to apply knowledge of basic electronics in making simple circuits using diodes and transistors and analyze the responses. 5. Ability to use the knowledge acquired for different applications and projects.

List of Experiments:

1. Determination of wavelength of the given laser using diffraction grating.
2. I-V characteristics of Zener-diode – (determination of knee voltage breakdown voltage and forward resistance).
3. Determination of Planck's constant using LED.
4. Determination of energy gap of a semiconductor.
5. Measurement of dielectric constant by charging and discharging method.
6. Determination of Fermi energy of copper.
7. I-V characteristics of NPN-Transistor in C-E mode. (Determination of knee voltage input resistance, output resistance, current gain and current amplification factor breakdown).
8. Photo diode characteristics (I-V characteristics in reverse bias, variation of photocurrent as a function of intensity and reverse voltage).
9. Determination of Young's modulus of the material by single cantilever method/uniform bending method.
10. Determination of resonant frequency, band width and quality factor of the given LCR series and parallel resonance circuits.
11. Determination of rigidity modulus of the material and moment of inertia of an irregular body using Torsional pendulum.
12. Measurement of numerical aperture and attenuation in optical fibers. (Demo Expt.)
13. Determination of electrical resistivity by four probe method. (Demo expt.)
14. Measurement of velocity of ultrasonic's in the given liquid-acoustic grating method. (Demo Expt.)

Sub Code: BTEC15F1900	**Basic Electrical Engineering Lab**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		2	1	1	0	3
Course Objectives	1. To establish a broad concept of various types of electrical apparatus, tools and instrumentation. 2. To provide hands on experience with electrical apparatus and electrical safety norms. 3. To train students to read and understand schematics so as to make					

	electrical connection for different appliances. 4. To train students in collecting and interpreting experimental data. 5. To enhance written skills of students.
Course Outcomes	On completion of this course the students will be able to: 1. Use appropriate electrical tools for electrical connections and repair of electrical equipments. 2. Recognize various symbols in a schematic and make connection as per the schematic 3. Systematically follow various safety procedures. 4. Make use of various measuring instruments to collect experimental data 5. Relate experimental results with theoretical analysis. 6. Demonstrate the ability to critically evaluate the performance of an electrical appliances.

List of experiments

1. Electrical tool introduction

    (i) Electrical Tools

    (ii)Measuring Instruments like Ammeter, Voltmeter, Multimeter, Clamp on meter, Energy meter, Watt meter (UPF & LPF)

2. Home electrical wiring demonstration:

    (i) Tube light wiring

    (ii) Fan wiring

    (iii) Two way control

    (iv) Socket to switch connection.

    (v) Electrical wiring materials & accessories

3. Study of mutual induction effect.

4. Electrical safety training:

    (i) Electrical activities to avoid shocks and importance of earthing

    (ii)Working of MCB, ELCB

    (iii) Role of fuse.

5. Home electrical wiring demonstration: short circuit, series and parallel operation of load.

6. Single phase transformer: polarity tests.

7. Diode rectifier applications: Half wave and Full wave rectifier, ripple factor calculations.

8. Sensor experiments: Pressure sensor, light sensor and temperature sensor.

9. DC Machine demonstration.

II Semester Chemistry Cycle

SL	Course Code	Title of the Course	HC/ SC/ OE	Credit Pattern & Credit Value				CH	Teaching School/Dept.
				C	L	T	P		
1	BTEM15F2100	Engineering Mathematics – II	HC	4	3	1	0	5	Mathematics
2	BTEC15F2200	Engineering Chemistry	HC	3	2	1	0	4	Chemistry
3	BTBE15F2300	Basic Electronics Engineering	HC	3	2	1	0	4	ECE
4	BTCC15F2400	Computer Concepts & C Programming	HC	3	2	1	0	4	CSE
5	BTES15F2500	Environmental Sciences	FC	2	1	1	0	3	Civil
6	BTTC17F2600	Technical English II	FC	2	1	1	0	3	Humanities
7	BTED15F2700	Computer Aided Engineering Drawing	HC	4	2	0	2	6	MECH
8	BTCL15F2800	Chemistry Lab	HC	2	1	0	1	3	Chemistry
9	BTCP15F2900	Computer programming Lab	HC	2	1	0	1	3	CSE
TOTAL CREDITS				**25**	**15**	**6**	**4**	**35**	

Sub Code: BTEM15F2100	**Engineering Mathematics – II**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		4	3	1	0	5
Prerequisites	Knowledge of basics of derivatives, vectors, complex numbers					
Course Objectives	1. To understand the concepts of Linear algebra and its applications in various fields of engineering and Technology. 2. To understand the concepts of Integral calculus and its applications. 3. To familiarize with partial differential equations, and its applications to standard problems like Heat, Wave and Laplace. 4. To impart the Knowledge of Laplace transforms and its applications in the field of engineering.					
Course Outcomes	After the completion of the course the student will be able to: 1. Apply the knowledge of Linear Algebra in Image processing and digital signal processing. 2. Apply the knowledge of Integral calculus to perform integration and other operations for certain types of functions and carry out the computation fluently. 3. Apply the knowledge of partial differential equations in the field of signals and systems, control systems, magnetic wave theory. 4. Apply the knowledge of Laplace transformation from the time domain to the frequency domain, which transforms differential equations into algebraic equations and convolution into multiplication.					

Course Contents

UNIT-I Linear Algebra **[14 hr]**

Rank of matrix, Echelon form, (*reference-Normal form: one example), Solution of a system of linear equations by Gauss elimination (*reference-Gauss –Jordan methods: one example), Gauss seidel iterative method, Rayleigh Power method to find the largest eigen value and corresponding eigen vector.LU decomposition, Linear and Inverse transformation.

Diagosnalisation of a matrix, Reduction of a quadratic form to canonical form by orthogonal transformation.

UNIT-II Differential Equations: **[14 hr]**

Linear Differential Equations: Definitions, Complete solution, Operator D, Rules for finding the complementary function, Inverse operator, Rules for finding the particular integral.

Method of variation of parameters (simple problems), Cauchy's and Legendre's linear differential equations.

Partial differential equation: Formation of Partial differential equations, Solution of Lagranges linear PDE.

UNIT-III Vector Calculus **[14 hr]**

Curves in space, tangents and normal, Velocity and acceleration related problems, scalar and vector point functions-Gradient, Divergence and curl, directional derivatives. Solenoidal and irrotational vector fields. Vector identities-div($\emptyset A$), curl($\emptyset A$), curl(grad$\emptyset$), div(curl A).

Line integral-Circulation-work, Surface integral: Green's Theorem, Stokes Theorem.

Volume integral: Divergence theorem. (All theorems without proof, no verification, only evaluation).

UNIT-IV Laplace Transforms: **[14 hr]**

Definition, Transforms of elementary functions, properties of Laplace Transforms (without proof) problems. Transforms of periodic functions (only statement and problems), Unit step functions and unit impulse functions.

Inverse Laplace transforms- Problems, convolution theorem (without proof) - verification and problems, solution of linear differential equation using Laplace transforms.

Text books:

1. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 43nd edition, 2015.

2. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Publications, 10th edition, 2015.

Reference Books:

1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Publications, 19th Edition, 2013.
2. R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House, 5th edition, 2014.

Sub Code: BTEM15F2100	**Engineering Chemistry**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		3	2	1	0	4
Course Objectives	1. To understand basic principles of Cell and Batteries, types of electrodes and their importance in some applications 2. To study and understand the materials required for designing and proper functioning of batteries. 3. To understand the Corrosion and metal finishing that explains why and how materials corrode and their prevention. 4. To understand the properties of various polymeric materials and their commercial significance.					
Course Outcomes	After the completion of the course the student will be able to: 1. Know the importance of electrodes and materials in designing abattery 2. Apply the knowledge of Corrosion phenomenon and precautions to be taken in the selection of materials in controlling corrosion 3. Fabricate of PCB which is an important component for electronic industries 4. Apply the knowledge of Properties of polymers and their applications in various field, also that of composite materials insports, aviation etc.,					

Course Contents

UNIT-I Cells and Batteries: **[14 hr]**

Introduction to electrochemistry, Basic concepts, Battery characteristics –primary, secondary and reserve batteries, Super capacitors, Lithium batteries.

Fuel cells-Difference between battery and fuel cell, types of fuel cells- construction working, applications, advantages& limitations of Solid oxide fuel cells and phosphoric acid fuel cell.

Photovoltaic cell-Production of single crystal semiconductor by Crystal pulling technique (Czocharlski method), zone refining of si, antireflective coatings, Construction and working of photovoltaic cells and its applications and advantages using elemental si and semiconductors.

UNIT-II Corrosion & its control & metal finishing. [14 hr]

Introduction: Electrochemical theory of corrosion, Galvanic series Types of Corrosion-Differential metal corrosion Differential aeration corrosion(Pitting & water line),Stress corrosion (Caustic embrittlement), and Grain boundary corrosion, Factors affecting rate of corrosion-Primary, secondary, pilling bed worth role, Energy concept (Pourbiax) under different pH conditions. Corrosion Studies on Al, Fe with phase diagram Corrosion control: Inorganic coating -Anodizing & Phosphating, metal coating- galivanzing & tinning, cathodic protection, Anodic Protection. Role of secondary reference electrode in corrosion studies (calomel ,Ag/AgCl)

Metal Finishing-Technological importance, significances of polarization. Decomposition potential & overvoltage in electroplating, theory of electroplating. Effect of plating variables on the nature of electrodeposit- electroplating process, Electroplating of gold, Introduction to Electro less plating-Cu.

UNIT-III Introduction to Nano science and Nanotechnology [14 hr]

Introduction to Nanomaterials, Properties –optical, electrical, magnetic and thermal .Chemical synthesis of Nanomaterials – sol gel (MOx NPs), phase transfer method (Au NPs). Carbon Nanomaterials-Fullerenes, graphene, CNT. Applications of nano materials- nano catalysis, nano-electronics, energy conversion materials (in batteries, solar cells), nano sensors.

Introduction to electromagnetic spectrum-material analysis, Instrumentation-principle, working and applications of UV-Visible, XRD, SEM.

UNIT-IV Polymers: [14 hr]

Introduction, Types of polymerization-Addition and Condensation, Ziegler's Natta catalyst, molecular weight determination by viscosity method, glass transition temperature, Structure and Property relationship. Synthesis & Applications of -Bakelite, ABS, Nylon, PMMA. Adhesives-Synthesis and applications of epoxy resins, Polymer composites- Synthesis and applications of Kevlar and Carbon fibers, Conducting polymers-Definition, Mechanism of conduction in

polyacetylene, Synthesis & applications of conducting Polyaniline, Polymer liquid crystals, Biopolymers, Polymer membranes-ion exchange & ionic conductivity

REFERENCES:

1. Engineering chemistry by R.V. Gadag and Nithyananda shetty, Ik Interanational Pudlishing House
2. Engineering chemistry by R.Venugopal, Pushpa Iyengar, B.S. Jayaprakash and Shivakumariah, Subhash Publications
3. Polymer chemistry by V.R. Gowrikar , N.N. Vishwanathan and J. Sreedhar by Wiley eastern Ltd.
4. Corrosion engineering by M.G. Fontana, Tata McGraHill Publishing Pvt. Ltd
5. Introduction to Nanotechnology by Charles P. Poole Jr., Frank J. Owens Wiley India Publishers
6. Theory and practice in applied chemistry by O.P. Vermani and Narulla, New age International Publications
7. Vogel's text book of quantitative chemical analysis by G.H. Jeffery, J. Bassett, J. Mendham and R.C. Denney.

Sub Code: BTBE15F2300	**Basic Electronics Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		3	2	1	0	4
Course Objectives	1. To familiarize with the number systems, Boolean algebra and digital circuit design. 2. To understand the diode characteristics and its applications. 3. To learn the working principles of various electronic circuits. 4. To understand the transistor characteristics and its applications. 5. To compare the different biasing methods of transistors. 6. To understand the working of amplifiers and communication systems. 7. To understand the power electronic devices.					
Course Outcomes	On completion of this course the student will be able to: 1. Design the digital circuits using various logic gates. 2. Analyze various diode circuits. 3. Work on various application based on electronic instruments. 4. Design of amplifier circuit based on BJT. 5. Demonstrate the working of amplifiers and the oscillators. 6. Analyze the various communication techniques. 7. Design Zener voltage regulator.					

Course Contents

UNIT-I Digital Electronics and Number Systems [14 hr]

Digital Electronics: Introduction, Switching and Logic Levels, Digital Waveform. Number Systems: Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System.

Number base conversions: Binary to Decimal, Decimal to Binary, Binary to Octal, Octal to Binary, Binary to Hexadecimal, Hexadecimal to Binary, Decimal to Octal, Octal to Decimal, Decimal to Hexadecimal, Hexadecimal to Decimal, Octal to Hexadecimal, Hexadecimal to octal. Complement of Binary Numbers. Binary addition, binary subtraction. Boolean Algebra Theorems, De Morgan's theorem. Digital Circuits: Logic gates, NOT Gate, AND Gate, OR Gate,NAND Gate, NOR Gate, XOR Gate, XNOR Gate. Algebraic Simplification, NAND and NOR Implementation NAND Implementation, NOR Implementation. Half adder and Full adder Implementations.

UNIT-II Semiconductor Diodes and Applications [14 hr]

p-n junction diode, Characteristics and Parameters, Diode approximations, DC load line analysis, Half-wave rectifier, Two-diode Full-wave rectifier, Bridge rectifier, Capacitor filter circuit,Zener diode voltage regulators: Regulator circuit with no load, Loaded Regulator, Series and Shunt diode Clipping Circuits, Clamping Circuits: Negative and Positive Clamping Circuits, Numerical examples as applicable.

UNIT-III Bipolar junction Transistors [14 hr]

BJT configuration: BJT Operation, BJT voltages and currents, BJT amplification, Common Base, Common Emitter and Common Collector Characteristics, Numerical examples as applicable.

BJT Biasing: DC load line and Bias Point, Base Bias, Voltage divider Bias, Numerical examples as applicable.

UNIT-IV Electronic Devices and Applications [14 hr]

SCR, controlled rectifier-full bridge type. Oscillators and applications. OPAMP-summer, subtractor, integrator and differentiator, and typical applications in measurements.

Communication system, embedded system, cellular communication, satellite communication, remote sensing. (block diagram approach)

Text Books :

1. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th Edition, 2008.
2. D.P. Kothari, I. J. Nagrath, "Basic Electronics", McGraw Hill Education (India) Private Limited, 2014.

Sub Code: BTCC15F2400	**Computer Concepts and C Programming**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		3	2	1	0	4
Course Objectives	The objective of this course is to: 1. Introduce the fundamentals of computer hardware and software. 2. Provide an understanding of problem solving with computers. 3. Introduce C programming language. 4. Provide a familiarization with the Unix programming environment. 5. Introduce problem solving through authoring and executing C programs.					
Course Outcomes	A student who successfully completes the course will have the ability to: 1. Use the basic terminology of computer programming; 2. Explain the different Unix commands, their usage and their syntax; 3. Write, compile and debug programs in C language; 4. Use different data types and operators in a computer program; 5. Design programs involving decision structures, loops and functions; 6. Use procedure calls by value and by reference; 7. Use arrays in applications like sorting and searching; 8. Handling strings; 9. Apply the C language knowledge to solve variety of problems.					

Course Contents

UNIT-I Introduction to Computer System, Organization, Hardware and Software: [14 hr]

Definition of Computer, Early history, Structure of a computer, Information Processing life cycle, Essential computer hardware - Microprocessors, Storage media, Essential computer software, Types and Functions of operating systems, Number systems, Computer processing techniques, Networking.

UNIT-II Getting started with UNIX – Introduction and Commands: [14 hr]

Introduction to Unix Operating System, Introduction to Basic Command Format, Working with Files, Using the VI text editor, working with Files and Directories, Filename Substitution and Wild Cards, Standard Input, Output & Error, Pipes and redirection, Shell Commands.

UNIT-III Fundamentals of Problem Solving and Introduction to C Language: [14 hr]

Algorithms and Flow charts, Introduction to C Language – Background, structure of a C Program, Input / Output, Tips and common programming errors, Expressions and Statements, Branching constructs, Looping constructs.

UNIT-IV More towards C language: [14 hr]

Functions in C, Recursion, Arrays, Strings, Introduction to pointers.

Recommended Learning Resources:

1. Herbert Schildt, C: The Complete Reference, 4th Edition, Tata McGraw Hill
2. Sumitabha Das, UNIX Concepts and Applications, 4th Edition; Tata McGraw Hill
3. Reema Thareja, Computer fundamentals and programming in C.
4. Kernighan, Dennis Ritchie, The C Programming Language ,2nd edition, Englewood Cliffs, NJ: Prentice Hall, 1988

Sub Code: BTES15F2500	**Environmental Sciences**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		2	1	1	0	3
Course Objectives	1. Gain knowledge on the components of environment and importance of environmental studies. 2. Understand the various types of energy and natural resources. 3. Acquire knowledge with respect to biodiversity, its threats and its conservation and appreciate the concept of ecosystem. 4. Get knowledge about environmental pollution-sources, effects and control measures of environmental pollution. 5. Explore ways for protecting the environment.					
Course Outcomes	On completion of this course the students will be able to: 1. Analyze the environmental conditions and protect it. 2. Find new renewable energy resources. 3. Analyze the ecological imbalances and protect it. 4. List the causes of environmental pollution. 5. Design pollution controlled products.					

Course Contents

UNIT-I Introduction: [14 hr]

Basic definitions, Objectives and Guiding principles of Environmental Studies, Components of Environment, Structures of atmosphere, Man-Environment relationship, Impact of Technology on the environment, sustainable environment, Environmental Protection - Role of Government, Initiatives by Non - Governmental Organizations (NGO)**.**

UNIT-II Energy & Natural Resources: [14 hr]

Energy - Different types of energy, Electro-magnetic radiation. Conventional and Non-Conventional sources - Hydro Electric, Fossil fuel based, Nuclear, Solar, Biomass and Bio-gas. Hydrogen as an alternative future source of Energy, Natural Resources- Water resources, Mineral Resources, Forest Wealth.

UNIT-III Ecology & Ecosystems: [14 hr]

Ecology- Objectives and Classification, Concept of an ecosystem - structure & function, Balanced ecosystem, Components of ecosystem - Producers, Consumers, Decomposers, Bio- Geo- Chemical Cycles & its Environmental significance (Carbon Cycle and Nitrogen Cycle), Energy Flow in Ecosystem, Food Chains: Types & Food webs Ecological Pyramids.

UNIT-IV Environmental Pollution: [14]

Introduction, Types, Concepts -Air Pollution, Water Pollution& Noise Pollution. Environmental Degradation- Global Warming, Green Houses Effects, Acid Rain, and Depletion of Ozone Layer.

Text books:

1. Benny Joseph (2005), "Environmental Studies", Tata McGraw – Hill Publishing Company Limited
2. Meenakshi P. (2006), "Elements of Environmental Science and Engineering", Prentice Hall of India Private Limited, New Delhi
3. Rajagopalan R. (2005), "Environmental Studies – From Crisis to Cure", Oxford University Press

Reference Books:

1. Raman Sivakumar, (2005), "Principles of Environmental Science and Engineering", Second Edition, Cengage learning, Singapore
2. Ranjit Daniels R.J. and Jagdish Kirshnaswamy, (2009), "Environmental Studies", Wiley India Private Ltd., New Delhi

3. Prakash S.M. (2007), "Environmental Studies", Elite Publishers, Mangalore
4. ErachBharucha (2005), "Text Book of Environmental Studies", for UGC, University Press
5. Tyler Miller Jr. G. (2006), "Environmental Science – Working with the Earth", Eleventh Edition, Thomson Brooks/Cole
6. "Text Book of Environmental and Ecology" by Dr. Pratibha Sing, Dr. Anoop Singh and Dr. Piyush Malaviya. Acme Learning Pvt. Ltd., New Delhi.

Sub Code: BTCE17F2600	**Technical English II**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		2	1	1	0	3
Course Objectives	1. To equip learners with the ability to use language effectively in real-life scenarios. 2. To develop the learners' competence in employability skills. 3. To inculcate the habit of writing leading to effective and efficient communication. 4. To emphasize specially on the development of technical reading and speaking skills among the learners of Engineering and Technology.					
Course Outcomes	On completion of the course, learners will be able to: 1. Express their opinions clearly and meaningfully. 2. Face interviews confidently. 3. Write accurately using different components of academic writing. 4. Draw inferences from the text; speak appropriately in social and professional contexts.					

Course Contents

Course Outline:
This is a 2 credit course for second semester consisting of 4 hours of teaching learning per week, inclusive of direct classroom teaching and practice in language lab.

Unit	**Description**	**Evaluation Pattern**	**Topics**	**Teaching Hours**
I	Language in Use	**25 Marks** Fill in the blanks/ MCQs	1. Vocabulary Building 2. Functional Words 3. Idioms & Phrasal Verbs 4. Homonyms & Homophones	16 Hours
II	Employability Skills	**25 Marks** Short Notes/ Descriptive Answers	1. Job Applications 2. Curriculum Vitae 3. Group Discussions 4. Presentation Skills 5. Role Plays 6. Interview Skills 7. Debates	16 Hours
III	Academic Writing	**25 Marks**	1. Essays	16 Hours

	– II	Short Notes/ Descriptive Answers	2. Letters 3. Dialogues 4. Proposals	
IV	Technical Speaking & Reading Skills	**25 Marks** Short Notes/ Descriptive Answers	1. Precis (Scientific Passages) 2. Public Speeches 3. Reading Manuals 4. Reading Scientific Reports 5. Interpreting Visual Materials	16 Hours

References:

1. Bansal, R.K. and J.B. Harrison. *Spoken English*. Orient Blackswan, 2013.
2. Raman, Meenakshi and Sangeeta Sharma. *Technical Communication*. Oxford University Press, 2015.
3. Thorpe, Edgar and Showick Thorpe. *Objective English*. Pearson Education, 2013.
4. Dixson, Robert J. *Everyday Dialogues in English*. Prentice Hall India Pvt Ltd., 1988.
5. Turton, Nigel D. *ABC of Common Errors*. Mac Millan Publishers, 1995.
6. Samson, T. (ed.) *Innovate with English.* Cambridge University Press, 2010.
7. Kumar, E Suresh, J. Savitri and P Sreehari (ed). *Effective English*. Pearson Education, 2009.
8. Goodale, Malcolm. *Professional Presentation*. Cambridge University Press, 2013.

Sub Code: BTED15F2700	Computer Aided Engineering Drawing	C	L	T	P	CH
Duration : 14 Wks		4	2	0	2	6
Preamble:	Any Engineer, irrespective of his branch of specialization, has to have certain knowledge in order to design and manufacture any product for usage of society. One of the most important knowledge lies in Engineering Drawing. Engineers are a special class of professionals whoemploy the art and science of dreaming image as a means of communication. Engineering drawing is the primary medium forcommunicating design concepts and is an important tool for analyzing engineering problems. This course aims at developing the skills needed for documenting designs using drawings and for performing graphical analysis of two dimensional. Manual and computer aided methods of drawings and communication are covered.					
Course Objectives	1. Comprehend general projection theory, with emphasis on orthographic projection to represent in two-dimensional views (principal, auxiliary, sections). 2. Dimension and annotate two-dimensional engineering drawings. 3. Understand the application of industry standards and best practices applied in engineering graphics. 4. Emphasize freehand sketching to aid in the visualization process and to efficiently communicate ideas graphically. 5. Introduction of CAD software for the creation of 2D engineering drawings. 6. The theoretical concepts delivered in this course would help the students to understand the sign considerations and tolerances to be used in the design and manufacture of engineering components. 7. This course will be very much basics for students to learn and wisely apply for the advanced Computer Aided Engineering (CAE) tools such as ABAQUS, ANSYS etc.					
Course Outcomes	On completion of the course, learners will be able to: 1. Develop independent thinking and problem solving capabilities. 2. Express component descriptions as per the commonly practiced standards. 3. Produce 2D and simple 3D drawings. 4. Comprehend industry specific drawings. 5. Converse through computer aided drawing any objects/tools/instruments/elements/ structures belonging to the entire engineering field. 6. Produce simple clear and illustrative drawings as per existing standards/conversations.					

Course contents

UNIT-I Introduction to Drawing: [14 hr]

Introduction to Engineering Drawing: Introduction, Drawing Instruments and their uses, BIS conventions, Drawing sheets, Lettering, Dimensioning, Scales, regular polygons and its methods, tangents, ellipse, parabola, hyperbola, loci, cycloids, trochoids, epi and hypocycloids, spirals and involutes, helix, Co-ordinate system and reference planes.

Introduction to Software (solid edge):

Computer screen, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational tools Creation of 2D/3D environment. Selection ofdrawing size and scale. Commands and creation of Lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim,extend to next ,split, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity. Dimensioning, line conventions, material conventions and lettering.

Orthographic Projection: Projection – Orthographic Projection – Planes of Projection – Four quadrants – First-angle projection – Third-angle projection – Reference line – Conventions employed.

Projection of points: Points in different quadrants.

Projection of Straight Lines (First-angle Projection only): Parallel to one or both planes – Contained by one or both planes – Perpendicular to one plane and parallel to other plane – Inclined to one plane and parallel to the other – Inclined to both planes.

Projection of Planes: Types of Planes – Perpendicular Planes – Oblique Planes – Projection of Planes - Parallel to one Plane – perpendicular to both planes – perpendicular to one inclines to other – Oblique planes (only change of position method).

UNIT-II Projection of Solids: [14 hr]

Polyhedra (Cube – Tetrahedron - Prisms and Pyramids) – Solids of revolution(Cone andCylinder) – Solids in simple position – Axis perpendicular to a plane – Axis parallel to both

planes – Axis parallel to one plane and inclined to the other – Axis inclined to both plane (only change of position method).

UNIT-III Sections of Solids: [14 hr]

Section Planes – Sections – True Shape of Section – Sections of Prisms – Sections of Pyramids – Sections of Cylinders – Section of Cones. Developments of Lateral Surfaces of Solids - Polyhedra (Cube – Tetrahedron - Prisms and Pyramids) – Solids of revolution (Cone andCylinder) and their Frustums.

UNIT-IV Isometric Projection: [14 hr]

Isometric axes - Lines and Planes – Isometric Scale – Isometric Projection of Planes – Prisms – Pyramids – Cylinders – Cones – Spheres - Hemi-Spheres - frustums - Combination of Solids (Maximum Three). Conversion of Orthographic Drawing to Isometric View / Pictorial Drawing of a simple Machine Components. Application Drawings: Civil drawing (building plans), electrical symbols and circuits, electronic symbols and circuits and simple assembly drawing (bolt and nut).

Text Books:

1. Engineering Drawing – N.D.Bhatt and V.M. Panchal, 48th Edition, 2005 – Charotar Publishing House, Gujarat.
2. A Primer on Computer Aided Engineering Drawing-2006, Published by VTU, Belgaum.
3. Computer Aided Engineering Drawing by Dr Balaveer Reddy and Co authors, CBS Publications, 2014

Reference Books:

1. Engineering Graphics - K.R. Gopalakrishna, 32nd Edition, 2005 – Subhas Publishers, Bangalore.
2. Engineering Drawing – P. S. Gill, 11th Edition, 2001 – S. K. Kataria & Sons, Delhi.

E-Material:

1. **Computer Aided Engineering Drawing- Vol. I,** (PPT) by Dr. Rajashekar Patil and Prof Gururaj Sharma T

Sub Code: BTCL15F2800	Engineering Chemistry Lab	C	L	T	P	CH
Duration : 14 Wks		2	1	0	1	3
Course Objectives	To provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence					
Course Outcomes	1. On completion of lab course students will have the knowledge in; 2. Handling different types of instruments for analysis of materials for better accuracy and precision 3. Carrying out different types of titrations for quantitative estimations of materials					

Course contents

LAB EXERCISES

1. Potentiometric estimation of FAS using standard K2Cr2O7.
2. Conduct metric estimation of an acid mixture using standard NaOH solution.
3. Determination of pKa of a weak acid using pH meter.
4. Determination of molecular weight of given polymer sample using ostmail's Viscometer.
5. Colorimetric estimation of copper.
6. Determination of COD of the given industrial waste water sample.
7. Determination of total and temporary hardness of water using disodium salt of EDTA.
8. Estimation of alkalinity of given water sample using standard HCl solution.
9. Determination of Iron in the given haematite ore solution using potassium dichromate.
10. Determination of calcium oxide in the given sample of cement by rapid EDTA method
11. Flame photometric estimation of sodium in the given sample of water.
12. Electroplating of copper and nickel.

Sub Code: BTCP15F2900	Computer Programming Lab	C	L	T	P	CH
Duration : 14 Wks		2	1	0	1	3
Course Objectives	1. Introduce the Basic Principles of Problem Solving using a Computer; 2. Present and Provide the Programming Constructs of 'C'Programming Language; 3. Provide the skills required to Design, Demonstrate and Implement Computable Problems / Mini-projects / Projects using 'C' Programming Language; 4. Provide the Arena for Development of Analytical, Reasoning and Programming Skills; 5. Set the Strong Foundation for Software Development in the field of Programming and hence to Create high quality 'C' Professionals.					
Course Outcomes	After completion of this course, the students would be able to: 1. Understand the Basic Principles of Problem Solving 2. Study, understand and identify the Representation of Numbers, Alphabets and other Characters in the memory of Computer System 3. Understand Analyze, Integrate, Apply and Demonstrate Software Development Tools; like Algorithms, Pseudo Codes and Programming Structures. 4. Study, Understand, Analyze and Categorize the logical structure of a Computer Program, and hence to Apply different programming constructs to develop a Computer Program using 'C' Programming Language. 5. Offer Engineering Solutions to simple (moderate) mathematical and logical problems using 'C' Programming Language. 6. Study, Understand, Analyze, Integrate, Classify, Compare and Apply simple Data Structures, Pointers, Memory Allocation and Data Handling through files using 'C' Programming Language. 7. Understand and identify the working of different Operating Systems; like Windows and Linux. 8. Enhance their Analytical, Reasoning and Programming Skills.					

Course contents

1. Unix Commands – execution and learn extra options than what is taught in theory
2. How to edit, compile and execute a C program on UNIX using editors like G-edit, K-write, writing a shell program.
3. Programs on data types, operators, expressions
4. Conditional statements – simple if statement, if-else statement, nested if-else, else-if ladder, switch statement

5. Looping statements – for, while and do-while statements
6. Arrays – 1-D and 2-D arrays
7. Programs on Sorting and searching
8. User defined Functions – pass by value, pass by reference, passing arrays to functions
9. Strings – finding length, string concatenation, string compare, substring search, palindromes etc
10. Programs on pointers.

Recommended Learning Resources:

1. Herbert Schildt, C: The Complete Reference, 4th Edition, Tata McGraw Hill
2. Sumitabha Das, UNIX Concepts and Applications, 4th Edition; Tata McGraw Hill
3. Reema Thareja, Computer fundamentals and programming in C.
4. Kernighan, Dennis Ritchie, The C Programming Language ,2nd edition, Englewood Cliffs, NJ: Prentice Hall, 1988
5. http://c-faq.com/index.html
6. Paul Deitel, C How to Program, 7th Edition, Deitel How to Series.

Sub Code:BTEE15F3100	Engineering Mathematics – III	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	To study and understand the application approach of the concepts of Numerical methods, Probability, random variables and Sampling distributions in various fields of engineering.					
Course Outcomes	After the completion of the course the student will be able 1. To understand the basics of numerical methods and their applications. 2. To solve the problems of Probability and statistics in various engineering fields. 3. To apply the numerical methods and Sampling Theory concepts to solve various engineering problems					

COURSE CONTENTS

UNIT-I Numerical Method – I **[14 hr]**

Numerical Solution of algebraic and transcendental equations: Regula-falsi method, Newton - Raphson method. Iterative methods of solution of a system of equations: 2 Gauss-seidel and Relaxation methods.

Finite differences and Interpolation :-Forward and Backward differences , Newton's forward and Backward interpolation formulae, Divided differences-Newton's divided difference formula, Lagrange's Interpolation formula and Inverse Interpolation formula and Problems.

UNIT –II Numerical Method – II **[14 hr]**

Numerical Differentiation and Integration:- Derivatives using Newton's forward and backward difference formula. Trapezoidal Rule, Simpson's $1/3^{rd}$, $3/8^{th}$ Rule, Weddle's formula and Problems.
Linear Programming : Mathematical Formulation of Linear Programming Problem(LPP) , Simplex Method , BigM method

UNIT-III Probability Theory – I **[14 hr]**

Introduction of Probability, Probability associated with set theory, addition law, conditional Probability, multiplication law, Baye's Theorem.

Random variables (discrete and continuous), Probability density function, probability distribution – binomial and Poisson's distributions; exponential and normal distributions.

UNIT-IV Probability Theory – II **[14 hr]**

Sampling theory:-Sampling, Sampling distributions, standard error, test of hypothesis for means and confidence limits for means and distributions and Chi-square distributions.

Joint Probability distribution and Markov's chains:-Concept of joint probability, joint distributions –discrete random variables, independent random variables, problems on expectationand variance.

Markov's chains-Introduction, probability vectors, stochastic matrices, fixed points and regular stochastic matrices, Markov's chains, higher transition probabilities, stationary distribution of regular Markov chains and absorbing states.

Text books:

1. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 42nd edition, 2013.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Publications, 9th edition, 2012.
3. K S Trivedi "Probability and Random processing".

Reference Books:

1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Publications, 1st edition, 2010.
2. R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House, 4th edition, 2002.

Sub Code:BTEE15F3200	**Electrical Circuit Theory- I**	**C**	**L**	**T**	**P**	**CH**
Duration:14Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To show the characteristics of basic network elements and to demonstrate the applications of loop and mesh analysis as well as of network reduction techniques. 2. To illustrate the concept of network theorems 3. To describe the constituents of two port network. 4. To discuss the concept of resonance. 5. To adopt graph theory for network reduction and analysis					
Course Outcomes	After the completion of the course the student will be able to: 1. Reduce given three phase networks using star delta transformation 2. Solve typical network problems using standard network theorems 3. Represent the given network in terms of two-port network 4. Formulate mathematical equations in matrix form through solve typical network problems using standard network theorems					

COURSE CONTENTS

UNIT- I Basic Concepts **[12 hr]**

Basic definitions. Practical sources, Source transformations, Network reduction using Star – Delta transformation, Loop and node analysis with linearly dependent and independent sources for DC and AC networks, Concepts of super node and super mesh.

UNIT- II Network Theorems **[12 hr]**

Superposition, Reciprocity and Millman's theorems, Thevenin's and Norton's theorems, Maximum Power transfer theorem

UNIT- III Two Port Network Parameters and Resonant Circuits **[12 hr]**

Definition of z, y, h and transmission parameters, modeling with these parameters and relationship between parameters sets. Problems. Driving point function and transfer function, Problems. Series and parallel resonance, frequency-response of series and parallel circuits, Q factor, Bandwidth.

UNIT- IV Network Topology **[12 hr]**

Graph of a network, Concept of tree and co-tree, incidence matrix, tie-set and cut-set schedules, Formulation of equilibrium equations in matrix form, solution of resistive networks and principle of duality.

Text Books:

1. Engineering Circuit Analysis, Hayt, Kemmerly and Durbin, TMH, 7th Edition, 2010.
2. Networks and systems, Roy Choudhury, New Age International Publications.,2nd Edition, 2006 re-print,

Reference Books:

1. Electric Circuits, Schaum's Outlines, M Nahvi & J A Edminister, TMH, 5th Edition, 2009.
2. Network Analysis, M. E. Van Valkenburg, PHI, 3rd edition, reprint 2009.
3. Analysis of Linear Systems, David K. Cheng, Narosa Publishing House, 11th reprint, 2002
4. Fundamentals of Electric Circuits, Charles K. Alexander and Matthew N. O. Sadiku

Sub Code:BTEE15F3300	**Electrical & Electronic Instrumentation and Measurements**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Wks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To provide basic knowledge about Measuring units of physical parameters. 2. To describe the principles of various measuring instruments 3. To equip students with basic concepts of different Electrical transducers used in process control. 4. To enable students with necessary mathematical skills for instruments' measurement range					
Course Outcomes	On completion of this course the students will be able to: 1. 1.Adoptvarious units associated with physical parameters 2. Select instruments for measurements based on the electrical parameters to be measured. 3. Describe the operation of measuring instruments 4. Decide a type of transducer for any particular application.					

COURSE CONTENT

UNIT- I Measurement of Resistance, Inductance and Capacitance [11 hr]

Wheat stone's bridge, sensitivity, limitations. Kelvin's double bridge. Earth resistance, measurement by fall of potential method and by using Insulation tester (Megger). Sources and detectors, Maxwell's inductance bridge, Maxwell's inductance &capacitance bridge, Schering bridge. Shielding of bridges. Problems

UNIT- II Transducers &Display Devices, Signal Generators [11 hr]

Classification and selection of transducers. Strain gauges. Measurement of temperature and pressure. Photo-conductive and photo-voltaic cells. , X-Y recorders. LCD and LED technology. Signal generators and function generators.

UNIT- III Electronic Instruments [11 hr]

Introduction. True RMS voltmeter. Electronic multimeters. Digital voltmeters. Q meter.
Dual trace oscilloscope — front panel details of a typical dual trace oscilloscope. Method of measuring voltage, current, phase, frequency and period. Use of Lissajous patterns. Working of a digital storage oscilloscope. Brief note on current probes ,clamp on meters/ tong testers

UNIT- IV Measurement of Power and Energy [11 hr]

Dynamometer wattmeter. UPF and LPF wattmeters, Measurement of real and reactive power in three-phase circuits. Principle of working of electronic tri-vector energy meter/Static Energy meter. Construction and operation of electro-dynamometer single-phase power factor meter. Weston frequency meter and phase sequence indicator. Smart metering system – AMR, e.g.: prepaid meter, ToD meter etc.

Text Books :

1. A. K. Sawhney, Dhanpatrai and Sons, "Electrical and Electronic Measurements and Instrumentation", New Delhi.
2. Cooper D. and A.D. Heifrick, "Modern Electronic Instrumentation and Measuring Techniques", PHI, 2009 Edition.

Reference Books:

1. David A. Bell , "Electronic Instrumentation and Measurement", oxford Publication ,2nd Edition, 2009.
2. Golding and Widdies, Pitman ,"Electrical Measurements and Measuring Instruments".

Sub Code:BTEE15F3400	Electrical Power Generation	C	L	T	P	CH
Duration :14 Wks		4	3	1	0	5
Course Objectives	1. To provide an awareness of various conventional and non-conventional energy resources and also of principle of their conversion process into electrical energy. 2. To provide fundamental concepts about Power plant structure, operation and control. 3. To equip the students with basic concepts of Substations, Grounding systems and economic aspects. 4. To provide basis for further study of both conventional and Non-Conventional Energy resources					
Course Outcomes	On completion of this course the students will be able to: **1.** Compare the relative merits and limitations of available Energy Sources. **2.** Interpret the values of various factors influencing the economic aspects of a power system **3.** Recognize the role of Substation and the fundamentals of Grounding systems. **4.** Estimate the energy cost from the given tariff.					

COURSE CONTENT

UNIT- I Sources of Electrical power and Power Generation-1 [11 hr]

Introduction: Fuel cell, tidal, geo-thermal, bio-generation, Concept of co-generation (waste heat recovery), Concept of distributed generation.(only block diagram approach)
Hydro Power Generation: Classification of hydro-electric plants, Mini-generation, micro-generation. General arrangement and operation. Selection of site, hydroelectric plant power station structure, control and Layout. Merits and demerits.
Wind Power Station: General arrangement and operation. Selection of site. Power station structure, control and Layout. Merits and demerits

UNIT- II Power Generation-2 [11 hr]
Solar Power Generation: General arrangement and operation. Selection of site. Power station structure, control and Layout, solar photovoltaic-grid integration. Merits and demerits
Nuclear Power Station: Pros and cons of nuclear power generation. Selection of site, cost, components of reactors, Types of reactors, Description of fuel sources. Safety of nuclear power reactor. Merits and demerits
Thermal Power Generation: General arrangement and operation, coal, gas and diesel, Selection of site. Power station structure, control and Layout. Merits and demerits, Concepts of Solar-thermal power generation.

UNIT- III Economics Aspects [11 hr]

Introduction: Terms commonly used in system operation. Diversity factor, load factor, plant capacity factor, plant use factor, plant utilization factor and loss factor, load duration curve. Cost of generating station. Numericals.
Tariff: Factors influencing the rate of tariff designing, types of tariff**.** Generation-tariff, end user-tariff. Power factor improvement. Numericals.

UNIT- IV Substations and Grounding Systems [11 hr]
Substations: Introduction, types, Bus bar arrangement schemes, Location of substation equipment. Reactors and capacitors. Interconnection of power stations
Grounding Systems: Introduction, grounding systems. Neutral grounding. Ungrounded system. Resonant grounding. Solid grounding, reactance grounding, resistance grounding. Earthing transformer. Neutral grounding transformer. Substation earthmat design – IEEE 80-2000.

Text Books:

1. A. Chakrabarti, M. L. Soni, and P.V. Gupta**," Power System Engineering",** Dhanpat Rai and Co., New Delhi.
2. S. N. Singh, PHI, **"Electric Power Generation, Transmission and Distribution",** 2nd Edition, 2009.
3. M. V. Deshpande**," Elements of Electrical Power System Design"**, PHI,2010
4. E.L-Wakil, "Power plant Technology", International Edition 1984, McGraw Hill book company, Singapore.
5. G.D. Rai, "**Non-Conventional Energy Sources** ", Published in 2011 by Khanna Publishers.

Reference Books:

1. Ajith Krishnan R, Jinshah B S, "**Magneto hydrodynamic Power Generation**" International Journal of Scientific and Research Publications, Volume 3, Issue 6, June 2013
2. Allen J wood & Wollenberg, "**Power generation, operation and control**", John Wiley and Sons, 2nd Edition.

Sub Code:BTEE15F3500	**Analog Electronics Circuit Design**	**C**	**L**	**T**	**P**	**CH**
Duration : 14 Wks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To provide an insight into the modeling of semiconductor diodes, bipolar junction transistors and their applications in the design and analysis of clippers, clampers, amplifiers and oscillators. 2. To illustrate the necessary biasing techniques of transistors. 3. To familiarize students with transistor characteristics in Common Collector, Common Base and Common Emitter Mode. 4. To enable students with the concept of positive feedback applied in oscillators. 5. To inculcate the skills of analyzing BJT amplifiers to compare their performance parameters.					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the operation, applicat ions and characteristics of devices including diodes and BJT. 2. Analyze and design circuits such as rectifiers, clippers, clampers,					

	amplifiers and oscillators. 3. Develop the capability to analyze and design simple circuitscontaining non-linear elements such as transistors using the concepts of load lines, operating points and incremental analysis. 4. Apply the concepts of both positive and negative feedback in electronic circuits. 5. Design circuits and analyze experimental results in the laboratory

COURSE CONTENTS

UNIT- I Diode Circuit **[11 hr]**

Diode Resistance, Diode equivalent circuits, Transition and diffusion capacitance, Reverse recovery time, Load line analysis.

Applications: Rectifiers, Clippers (series and shunt types, biased) and clampers (positive and negative, biased)

UNIT- II Transistor biasing **[11 hr]**

DC load line – Q point effect on signal swing – different biasing techniques Bias stability – stability factors

Transistor Amplifiers and frequency response: BJT transistor modeling (re and h models) for various CE configurations (fixed bias, voltage divider bias and emitter bias) , Small signal BJT amplifiers:- analysis of CE configuration using re-model, h- parameter model; emitter follower, boot strapping, Miller effect, gain bandwidth product.

UNIT- III **[11 hr]**

General amplifiers, feedback amplifiers & power amplifiers

General amplifiers Darlington connections

Feedback Amplifiers: - Characteristics of feedback, feedback topologies, Ideal Analysis of feedback amplifiers.

Power amplifiers: - classification and application, series fed class A amplifier, Transformer coupled Class A amplifiers, Class B Push-Pull amplifiers:- Complementary Push-Pull and Transformer–coupled load Push-Pull, Amplifier distortions.

UNIT- IV Oscillators **[11 hr]**

Principle of operation (Barkhausen's Criteria, positive feedback concept), Audio frequency Oscillators, Radio frequency Oscillators , Crystal Oscillators. (BJT Version Only)

Text books:

1. Robert L. Boylestad and Louis Nashelsky, "Electronic Devices and Circuit Theory", PHI/Pearson Education. 9th Edition.
2. Albert Malvino, "Electronic principles", 8th Edition, McGraw-Hill Higher Education.

Reference books:

1. Jacob Millman & Christos C. Halkias , "Integrated Electronics", Tata - McGraw Hill, 2nd

Edition, 2010.
2. David A. Bell, "Electronic Devices and Circuits", PHI, 5th Edition, 2009.
3. Muhammad H. Rashid, "Electronic Circuits and Applications", Cengage learning, 1st Edition
4. Muhammad H. Rashid, "Electronic Devices and Circuits", Cengage Learning, 1st Edition

Sub Code:BTEE15F3600	**Digital Electronic Circuit Design**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Wks		**3**	**2**	**1**	**0**	**4**
Course Objectives:	1. Illustrate Boolean laws and systematic techniques for minimization of expressions. 2. Demonstrate the methods for simplifying Boolean expressions also familiarize the commonly used terms like minterm, canonical expression, SOP etc. 3. Introduce the Basic concepts of combinational and sequential logic. 4. Present real world examples for making the learners attuned to Logic concepts. 5. Introduce the concept of memories, programmable logic devices and digital ICs.					
Course outcomes	At the end of this course, student will be able to: 1. Define a Boolean term, expression, SOP, POS, Minterm etc. 2. Construct the K-map from a Boolean expression and to find the minimal SOP/POS forms. 3. Determine the output and performance of given combinational and sequential circuits 4. Design arithmetic and combinational logic circuits using gates, encoders, decoders, multiplexers and de-multiplexers. 5. Design specified synchronous or asynchronous sequential logic circuits using appropriate flip flops.					

COURSE CONTENTS

UNIT- I Principle and Minimization Techniques of combinational Circuits [11 hr]

Introduction to combinational logic circuits, generation of switching equation from truth table. Minimization Techniques: Boolean postulates and laws, De-Morgan's Theorem, Boolean algebra, expression minimization. Minterm, Maxterm, Sum of Products (SOP), Product of Sums (POS), Karnaugh map (3, 4, 5 Variable) and Quine - McCluskey method of minimization

UNIT- II Analysis and Design of Combinational Circuits [11 hr]

Design procedure of Half adder, Full Adder, Half subtractor, Full subtractor, Carry Look Ahead adder, BCD adder, Comparator – 1bit and 2 bit , Principle of Encoder and Decoder with cascading of decoders. Principle of Multiplexers and Demultiplexer with cascading of Mux and Boolean function implementation using Mux and decoders.

UNIT- III Introduction to Sequential circuits [11 hr]

Basic bistable element, S R Latch , application of SR latch as a switch debouncer, Edgetriggering – Level Triggering, Flip-flops - SR, JK, D, T, and Master-Slave – Characteristic table and equation. Registers, Shift Register, Universal shift register, Counters: Binary Ripple Up/Down Counter, Design of synchronous Mod- n counter using flip-flop.

UNIT- IV Sequential Circuits' Design & Logic Families [11 hr]

Sequential Design: Introduction to Mealy and Moore Model circuits. State machine notation, Synchronous sequential circuit analysis and construction of state table and diagram.

Logic families: Diode-Transistor Logic, Transistor-Transistor Logic, Emitter-Coupled Logic, NMOS and PMOS Logic, CMOS Logic.

Text Books:

1. John M Yarbrough, "**Digital Logic Applications and Design**", Thomson Learning, 1st Edition, 2001.
2. Donald D Givone, "**Digital Principles and Design**", Tata McGraw-Hill 1st Edition, 2002.

Reference books:

1. D P Leach, A P Malvino, & Goutham Saha, " **Digital Principles and applications**", Tata McGraw-Hill, 7th Edition, 2010.
2. Moshe Morris Mano, "**Digital Design**" Prentice Hall, 3rd Edition, 2008.
3. Samuel C Lee, " **Digital Circuits and Logic Design**" ,PHI learning, 1st Edition, 2009
4. Chales H Roth, Jr., "**Fundamentals of Logic Design**", Cengage learning, 5th Edition, 2004

Sub Code:BTEE15F3700	**Analog Electronic Circuit Design Laboratory**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Wks		**2**	**1**	**0**	**1**	**3**
Course Objectives	1. To enable students to identify the various electronic components To enable students to verify theoretical analysis with experimental results. 2. To enable students to conduct experiments, collect results, interpret results and analyze any discrepancies					
Course Outcomes	Students will be able to 1. Rig circuit as per the circuit and conduct experiments. 2. Demonstrate the ability to design circuits for a given specification and to choose appropriate instruments for measurements. 3. Become adept at using various methods of circuit analysis, including simplified methods such as series-parallel reductions, KVL and KCL, voltage and current dividers and the node method. 4. Analyze and design simple electronic circuits such as rectifiers, clippers, clampers, amplifiers and oscillators. 5. Develop the capability to analyze and design simple circuits containing non-linear elements such as transistors using the concepts of load lines, operating points and incremental analysis. 6. Interpret the obtained experimental results 7. Present the results in a professional manner. .					

List of lab experiments:

1. Design and Testing of Diode Clipping (Single and Double ended) circuits.
2. Design and Testing of Clamper Circuits (Positive and Negative Clamping).
3. Design of RC coupled Single stage BJT amplifier and determination of the gain-frequency response, input and output impedances.
4. Design of BJT Darlington Emitter Amplifier and determination of the gain frequency response and input /output impedance.
5. Design and testing of BJT R-C Phase shift Oscillator.
6. Design and testing of BJT Hartley and Colpitt's Oscillators.
7. Design of Rectifier Circuits with and without capacitor filter. Determination of ripple factor, regulation and efficiency.
8. Design of Class-B Push-Pull Amplifier and determination of its conversion efficiency.
9. Study of Crystal Oscillator.
10. Study of Voltage series feedback amplifier and determination of the gain, Input and output Impedance.

Sub Code:BTEE15F3800	**Digital Electronic Circuit Design Laboratory**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Wks		**2**	**1**	**0**	**1**	**3**
Course Objectives:	1. To enable students to identify the various electronic components like logic gates 2. To enable students to verify theoretical analysis with experimental results 3. To enable students to conduct experiments, collect results, interpret results and analyze any discrepancies.					
Course outcomes	At the end of this course, Student will be able to: 1. Define a Boolean term expression, SOP, POS, Minterm etc. 2. Contrast and differentiate combinational and sequential circuits. 3. Express real world reasoning problems in terms of logic expressions. 4. Apply systematic techniques for reducing Boolean Logic expressions. 5. Develop Logic Circuits to satisfy requirements of the problem statement. 6. Analyze given logic circuit to deduce the real world problem it is implementing. 7. Assemble basic elements like gates to design basic memory elements called flip flops. 8. Design and develop advanced sequential entities like registers and counters.					

List of lab experiments:

1. Simplification, realization of Boolean expressions using logic gates/universal gates.
2. Realization of Half/Full adder and Half/Full Subtractors using logic gates.
3. (i) Realization of parallel adder/Subtractors using7483 chip (ii) BCD to excess-3 code conversion and vice-versa.
4. Realization of Binary to Gray code conversion and vice-versa.
5. Realization of One/Two bit comparator and study of 7485 magnitude comparator.
6. Use of a) Decoder chip to drive LED display and b) Priority encoder.
7. Use of a) Decoder chip to drive LED display and b) Priority encoder.
8. Truth table verification of Flip-Flops: (i) JK Master Slave (ii) T-Type and (iii) D Type
9. Realization of 3 bit counters as a sequential circuit and MOD – N counter design (7476, 7490, 74192, 74193).
10. Shift left; Shift right, SIPO, SISO, PISO, PIPO operations using 74S95.
11. Wiring and testing Ring counter/Johnson counter.
12. Wiring and testing of Sequence generator.

IVSemester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F4100	Engineering Mathematics – IV	HC	4	3	1	0	5
2	BTEE15F4200	Electrical Circuit Theory- II	HC	3	2	1	0	4
3	BTEE15F4300	Electromagnetic Theory	HC	3	2	1	0	4
4	BTEE15F4400	Electrical Machines I	HC	3	2	1	0	4
5	BTEE15F4500	Microcontrollers and Applications	HC	3	2	1	0	4
6	BTEE15F4600	Power Electronics	HC	3	2	1	0	4
7	BTEE15F4700	Microcontroller Laboratory	HC	2	1	0	1	3
8	BTEE15F4800	Power Electronics Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**23**	**15**	**6**	**2**	**31**

Sub Code:BTEE15F4100	**Engineering Mathematics –IV**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	To study and understand the application approach of the concepts of Numerical methods, Fourier transforms, Z-transforms and Complex variables.					
Course Outcomes	After the completion of the course the student will be able 1. To understand the basics of numerical methods and their applications. 2. To solve the problems of Probability and statistics in various engineering fields. 3. To apply the numerical methods and Sampling Theory concepts to solve various engineering problems.					

COURSE CONTENTS

Unit –I **(13 hours)**

Numerical Methods –III: (i) Numerical solution of simultaneous first order ODE :Picard's and Runge-Kutta method of fourth order.

(ii) Numerical solution of second order ordinary differential equations, Picards method, Runge-Kutta method and Milne's method

(iii) Numerical solutions of PDE: Finite difference approximations to derivatives, Numerical solution of two –dimensional Laplace equation, one-dimensional Heat and Wave Equations.

Unit –II **(13 hours)**

Fourier series and Transforms :Convergence and divergence of infinite series of positive terms , definition and illustrative examples, periodic functions, Dirichlet's conditions and Fourier series of period functions of period 2π and arbitrary period , half range Fourier series , Complex form of Fourier series and Practical Harmonic analysis.

Infinite Fourier Transform, Fourier sine and cosine transforms, properties,inverse transforms.

Unit-III **(13 hours)**

Z-transforms and special functions :Z-Transforms- Definition, standard Z-transforms , damping rule, shifting rule , initial value and final value theorems , inverse Z-transform , application of Z-transform to solve difference equations.

Solution of Laplace equation in cylindrical and spherical systems leading Bessel's and Legendre's differential equations, Series solution of Bessel's differential equation leading to Bessel function of first kind, Series solution of Legendre's differential equation leading toLegendre polynomials, Rodrigue's formula.

Unit-IV **(13 hours)**

Complex variables –I & II

Function of a complex variable, Analytic functions-Cauchy-Riemann equations in cartesian and polar forms. Propertie of analytic functions.

Application to flow problems- complex potential, velocity potential, equipotential lines, stream functions, stream lines.

Conformal Transformations: Bilinear Transformations. Discussion of Transformations:$w = z^2$, w = e^z, $w = z + (a^2 / z)$,Complex line integrals-Cauchy's theorem and Cauchy's integral formula

Text books:

1. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 43nd edition, 2015.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Publications, 10th edition, 2015.

Reference Books:

1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Publications, 19th edition, 2013.
2. R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House, 5th edition, 2014.

Sub Code:BTEE15F4200	Electrical Circuit Theory- II	C	L	T	P	CH
Duration:14Weeks		3	2	1	0	4
Course Objectives	1. To teach the importance of dot convention in coupled circuits. 2. To establish the role of initial conditions in transient analysis. 3. To make use of tools like Fourier series, Laplace Transform and state variable techniques in analyzing circuits. 4. To provide basic knowledge of network synthesis and realization of filters. 5. To provide an insight into frequency plots.					
Course outcomes	1. Able to develop KVL equations for the coupled circuits. 2. Able to apply Fourier series and Laplace Transform Techniques for typical network problems 3. Able to express state variables in terms of circuit parameters. 4. Able to realize networks out of network functions					

COURSE CONTENTS

UNIT – I Coupled Circuits and Initial Conditions [11 hr]

Mutual inductance, coupling coefficient, analysis of coupled coils, dot rule, conductively coupled equivalent circuits, problems.

Behavior of circuit elements under switching condition and their representation, evaluation of initial and final conditions in RL,RC and RLC circuits for AC and DC excitations.

UNIT – II Application of Fourier series and Laplace Transform [11 hr]

Introduction to trigonometric Fourier series, Exponential Fourier series, Waveform symmetry, Effective values and power, applications in circuit analysis, Fourier transform of non periodic waveforms,

Introduction to Laplace transformation, step, ramp and impulse functions, gate function, Laplace transform of periodic functions, solution of network problems, waveform Synthesis. Application of Convolution theorem and Convolution integral, impulse response, Initial value and final value theorems.

UNIT – III State Variable Analysis [11 hr]

Introduction, state variable approach, state space representation, transfer function, linear transformation, diagonalization, state transition matrix, solution to non homogeneous state equations, minimal set of state variable formulation.

UNIT – IV Synthesis and Frequency response [11 hr]

Passive network synthesis: Realizing a reactance network-Foster and Cauer forms

Attenuators: Introduction, Nepers, Decibels, T-type attenuator, π-type attenuator, insertion loss.

Frequency response plots: Introduction, plots from s-plane phasors, polar plot, problems.

Textbooks:

1. Roy Choudhury, "Networks and systems", New Age International Publications., 2nd Edition, 2006 re-print.

2. Charles K. Alexander and Matthew N. O. Sadiku, "Fundamentals of Electric Circuits".
3. David K. Cheng," Analysis of Linear Systems", Narosa Publishing House, 11th reprint, 2002.

Reference books:

1. Hayt, Kemmerly and Durbin ,"Engineering Circuit Analysis", TMH ,7th Edition,2010.
2. M. E. Van Valkenburg ,"Network Analysis", PHI, 3rd edition, reprint 2009.
3. Schaum's Outlines, M Nahvi & J A Edminister, "Electric Circuits", TMH, 5th Edition, 2009

Sub Code:BTEE15F4300	**Electromagnetic theory**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To study the basic concepts of vector calculus and co-ordinate system. 2. To discuss the concept of potential and energy density in the case of static and time varying fields. 3. To discuss the concepts of Coulomb's law and Gauss law and their applications. 4. To study the concept of the steady magnetic field, magnetic materials and inductance calculation. 5. To provide the knowledge of time varying field and Maxwell's equations.					
Course Outcomes	After the completion of the course the student will be able to: 1. Able to understand the concepts of vector calculus and co-ordinate system. 2. Able to understand the concept of potential and energy density in the case of static and time varying fields. . Able Coulomb's law and Gauss law and their applications in real world applications. 3. Able to understand the steady magnetic field, magnetic materials and inductance calculation 4. Investigate the electromagnetic phenomenon in a time varying electric and magnetic fields.					

COURSE CONTENTS

UNIT-I **[11 hr]**

Coulomb's Law and electric field intensity: Experimental law of Coulomb, Electric field intensity, Field due to continuous volume charge distribution, Field of a line charge.

Electric flux density, Gauss' law and divergence: Electric flux density, Gauss' law, Divergence, Maxwell's First equation (Electrostatics), vector operator ∇ and divergence theorem.

UNIT-II **[11 hr]**

Energy and potential : Energy expended in moving a point charge in an electric field, The line integral, Definition of potential difference and Potential, The potential field of a point charge and system of charges, Potential gradient , Energy density in an electrostatic field.
Conductors, dielectrics and capacitance: Current and current density, Continuity of current, metallic conductors, Conductor properties and boundary conditions, boundary conditions for perfect Dielectrics, capacitance and examples.
Poisson's and Laplace's equations: Derivations of Poisson's and Laplace's Equations, Uniqueness theorem, Examples of the solutions of Laplace's and Poisson's equations

UNIT-III **[11 hr]**

The steady magnetic field: Biot-Savart law, Ampere's circuital law, Curl, Stokes' theorem, magnetic flux and flux density, scalar and Vector magnetic potentials.
Magnetic forces: Force on a moving charge and differential current element, Force between differential current elements, Force and torque on a closed circuit.

UNIT-IV **[11 hr]**

Magnetic materials and inductance: Magnetization and permeability, Magnetic boundary conditions, Magnetic circuit, Potential energy and forces on magnetic materials, Inductance and Mutual Inductance.
Time varying fields and Maxwell's equations: Faraday's law, displacement current, Maxwell's equation in point and Integral form, retarded potentials.

Text books:
1. William H Hayt Jr. and John A Buck, "Engineering Electromagnetics", Tata McGraw-Hill, 7th edition, 2006

Reference Books:
1. John Krauss and Daniel A Fleisch, "Electromagnetics with Applications"**,** McGraw-Hill, 5th edition, 1999
2. Edward C. Jordan and Keith G Balmain, "Electromagnetic Waves And Radiating Systems," Prentice – Hall of India / Pearson Education, 2nd edition, 1968.Reprint 2002
3. David K Cheng, "Field and Wave Electromagnetics", Pearson Education Asia, 2nd edition, -1989, Indian Reprint – 2001

Sub Code:BTEE15F4400	**Electrical Machines - I**	**C**	**L**	**T**	**P**	**CH**
Duration :16 weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To enable the students to familiarize with the theory, construction, classifications and working principle of transformers and Induction motors 2. To enable to learn the necessity of different tests conducted and the parallel operation on single phase transformers 3. To enable to study the Classification and different connections of three phase Transformers 4. To enable to draw equivalent circuit & circle diagram for the					

	performance Analysis of three phase induction motor. 5. To enable to understand the necessity of starters & speed control for 3 phase IM
Course Outcomes	On the successful completion of this course, the student is expected to be able to: 1. Reveal their knowledge and understanding of electromechanical energy conversion in Transformers and Induction machines. 2. Analyze the concepts of fundamental torque equation and rotating fields 3. Analyze the fundamental characteristics of Transformers and Induction machines. 4. Interpret experimental results and correlate them with theoretical predictions.

COURSE CONTENTS

UNIT – I Single phase transformers [11 hr]

Introduction, Construction and Principle of transformer, operation of ideal, practical transformer at no load and on load, phasor diagram, voltage current and power relations. Exact and approximate equivalent circuits. Transformer losses, efficiency, regulation and conditions. o c & s c test on transformer, sumpner's test. Parallel operation of transformers. Auto-transformer in brief and relevant problems

UNIT – II Three phase transformers [11 hr]

Introduction to 3-Phase transformers, three phase transformer connections. .Exact andapproximate per phase equivalent circuit; phasor diagram under no load and loaded conditionand relevant problems. Open Delta connections, V connections

UNIT – III Induction machines [11 hr]

Introduction to single phase& three phase induction motor, constructional details of 3 ph. induction motor, three phase rotating magnetic field. Exact and approximate per phase equivalentcircuit; phasor diagram under no load and loaded condition. Power flow diagram in a three phaseinduction machine, air gap power, slip power, mechanical power; torque-slip and current-slip characteristics. Starting torque, breakdown slip, breakdown torque, maximum mechanical power, effect of equivalent circuit parameters and relevant problems. Introduction to Induction Generators

UNIT – IV Testing of three phase induction machines [11 hr]

No load and blocked rotor tests for determining equivalent circuit parameters; losses and efficiency. Induction machine performance computation from circle diagram. Cogging torque and crawling; induction machines with deep bar and double cage rotors and relevant problems. Direct on line starting, rotor resistance based starting. Star/delta and auto transformer based starting. Speed control of induction motors by stator voltage variation and pole changing

techniques. Variable frequency speed control of induction machines, v/f control method, slip power control method and relevant problems

Text books:

1. Electric Machines, I.J. Nagarath and D. P. Kothari, T.M.H 4th Edition,2010
2. Electric Machines, Mulukuntla S Sarma, Mukesh K. Pathak, Cengage Learning, First edition, 2009.

References

1. Performance and Design of A C Machines, M G Say, C S B Publishers, 3rdEdition, 2002
2. Theory of Alternating current Machines, Alexander Langsdorf, T M H 2nd edition, 2001
3. Electrical Machines and Transformers, Kosow, Pearson, 2nd edition, 2007

Sub Code:BTEE15F4500	**Microcontrollers and Applications**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To describe the architecture of microcontroller and various features associated with different models of the microcontrollers. 2. To discuss various computations and accessing methods associated with the microcontrollers. 3. To develop the skill of programming microcontrollers in controlling different applications in real time. 4. To demonstrate the interfacing of various devices to the microcontroller.					
Course Outcomes	After the completion of the course the student will be able to: 1. To recognize the architecture of the 8051 and MSP430 microcontrollers. 2. To be adept at using various inbuilt features and external peripherals based on the requirement. 3. To program the microcontroller IC to suit the application and design simple electronic circuits which could be controlled using the microcontroller. 4. To develop the ability to program any microcontroller knowing the features of the chosen IC and to interface external devices to the microcontroller.					

COURSE CONTENTS

UNIT-I Fundamentals of 8051 [11 hr]

Fundamentals of Microprocessor, Comparison of Microprocessor and Microcontroller, Harvard and Von Neuman architecture, RISC and CISC, block diagram of Microcontroller 8051 and functions of each block**,** pin details of 8051, Memory organization, External memory interfacing, stack, time delay calculations.

UNIT-II Features of 8051 [11 hr]

Instruction set of 8051 along with simple programs, addressing modes, programming in C, Timers/Counters and programming, Interrupts and programming.

UNIT – III Communication and Interfacing [11 hr]

I/O port programming, Serial communication.
Interfacing: ADC and DAC, LCD, DC motor, stepper motor, sensors (e.g.: temperature, pressure). Case studies/application notes.

UNIT-IV MSP 430 microcontroller [11 hr]

MSP430 RISC CPU architecture, instruction set, on-chip peripherals of MSP430, Programming in C, case studies/application notes.

Text books:

1. Muhammad Ali Mazidi and Janice Gillespie Mazidi and Rollin D. McKinlay ,"The 8051 Microcontroller and Embedded Systems – using assembly and C ", PHI, 2006 / Pearson, 2006
2. John Davies , "MSP430 Microcontroller Basics", Elsevier, 2010 (Indian edition available)

Reference Books:

1. Ajit pal , "Microcontrollers, Principles and Applications " PHI Ltd., - 2011.
2. Design reference notes and data sheets of MSP430 (TI).

Sub Code:BTEE15F4600	**Power Electronics**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To provide basic knowledge of power semiconductor devices. 2. To illustrate the students with the design concepts of Gate driver circuits, isolation and protection circuits of various power semiconductor devices. 3. To distinguish the Diode Rectifiers with Phase controlled Rectifiers for various loads. 4. To inculcate the skills of analyzing the basic topologies of DC-DC converters and AC voltage regulators for various loads. 5. To discuss the different modulation techniques of pulse width modulated inverters.					
Course Outcomes	After the completion of the course student will be able to: 1. Acquire a basic knowledge of solid state electronics devices including power diodes, power BJT and power MOSFETs. 2. Develop circuit models using electronic components such as resistors, capacitors, diodes and transistors. 3. Design the power semiconductor devices drive circuitry and driver ICs and heat sinks. 4. Analyze and design electronic circuits such as control rectifiers, inverters, choppers &AC voltage regulators. 5. Describe the role of Power Electronics as an enabling technologyin various applications such as flexible production systems, energy					

	conservation, renewable energy, transportation etc.

COURSE CONTENTS

UNIT – I Power Semiconductor Devices [11 hr]

Introduction to Semiconductors, Power Electronics, Power semiconductor devices – control characteristics. Types of power electronic converters, Industrial applications.

Power Transistors: Power BJT's – switching Characteristics, switching limits, base drive control, Power MOSFETs & IGBT's characteristics, gate driver circuits, Isolation of gate and base drives.

UNIT – II Thyristors [11 hr]

Introduction, Two Transistor Model, Characteristics – Static & Dynamic, di/dt , dv/dt protection, Ratings & Types of thyristors, Series & Parallel operations of thyristors, Thyristors firingcircuits: Design using UJT, R, RC circuits.

Commutation Techniques: Definitions and conditions for commutation, Natural & Forced commutation, self-commutation, impulse commutation, resonant pulse commutation, Complementary commutation

UNIT – III [11 hr]

(a) Phase Controlled Converters

Introduction to 2-pulse, 3-pulse, 6-pulse converters, Principle of phase controlled converter operation, Single phase semi& full converters with R and RL load, Significance of freewheeling diode, Three phase half wave & full converter. (Only qualitative analysis)

(b) AC Voltage Controller

Introduction, Principle of ON-OFF & Phase Control, Single Phase bi-directional controllers with R & RL Loads.

UNIT – IV [11 hr]

(a) DC to DC Converters

(a) Introduction, Principle of step down & step up chopper with R and R-L load, Performance parameters, Time ratio control and current limit control, Chopper Classification.

(b) Inverters

Introduction, Principle of operation, Performance parameters, Single phase bridge inverters, three phase inverters (both 120^0 mode and 180^0 mode). PWM Techniques to control voltage of single phase inverters -- Single PWM, Multiple PWM & Sinusoidal PWM, Current Source inverters

Text books:

1. M.H. Rashid, "Power Electronics: Circuits, Devices, and Applications", Prentice-Hall International third edition 2006.

2. M D Singh and Khanchandani K B , “Power Electronics”, TMH second edition 2001.

Reference Books:

1. Mohan / Undeland / Robbins , “Power Electronics: Converters, Applications, and Design”, Wiley third edition 2008.
2. John G. Kassakian, Addison Wesley , “Principles of Power electronics”.

Sub Code:BTEE15F4700	**Microcontroller Laboratory**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**2**	**1**	**0**	**1**	**3**
Course Objectives	1. Understand the architecture of microcontroller and various features associated with the different models of the microcontrollers. 2. Understanding of various computations and accessing methods associated with the microcontrollers. 3. Gain the knowledge of programming. 4. Develop the ability to program the microcontroller in controlling the different applications in real time. 5. Develop the capability to program and interface various devices to the microcontroller.					
Course Outcomes	After the completion of the course the student will be able to: 1. Learn the architecture of the 8051, PIC and MSP430 microcontrollers. 2. Become adept at using various inbuilt features and external peripherals based on the requirement. 3. Design simple electronic circuits which could be controlledusing the microcontroller. 4. Develop the capability to program any microcontroller knowing the features of the chosen IC and to interface external devices to the microcontroller.					

List of Experiments:

1. Data Transfer, Data Exchange, Bubble Sort,
2. Arithmetic & Logic operations – addition, subtraction, multiplication(16 bit), division(8 bit), 2 out of 5 code.
3. Bit manipulation – Boolean expression implementation
4. Code conversions – ASCII to BCD, BCD to ASCII, Hex to Decimal, Decimal to Hex
5. DAC & ADC interfacing with 8051
6. Keypad & LCD interfacing with 8051
7. Stepper & DC motor interfacing with 8051

Sub Code:BTEE15F4800	Power Electronics Laboratory	C	L	T	P	CH
Duration: 14 Weeks		2	1	0	1	3
Course Objectives	1. To get an overview of different types of power semi-conductor devices and their switching characteristics. 2. To understand the operation, characteristics and performance parameters of controlled rectifiers. 3. To study the operation, switching techniques and basic topologies of DC-DC switching regulators. 4. To learn the different modulation techniques of pulse width modulated inverters and to understand the harmonic reduction methods.					
Course Outcomes	After the completion of the course the student will be able to: 1. Acquire a basic knowledge of solid state electronics devices including power diodes, power BJT and power MOSFETs. 2. Develop circuit models using electronic components such as resistors, capacitors, diodes and transistors. 3. Analyze and design electronic circuits such as control rectifiers, inverters, choppers & ac voltage regulators. 4. Describe the role of Power Electronics as an enabling technology in various applications.					

List of Experiments:

1. Static characteristics of SCR
2. Static characteristics of MOSFET and IGBT
3. SCR turn on circuit using synchronized UJT relaxation oscillator.
4. SCR Digital triggering circuit for a single phase controlled rectifier and AC voltage regulator
5. Single phase controlled full wave rectifier with R and RL loads
6. AC voltage controller using TRIAC and DIAC combination connected to R and RL loads
7. Speed control of a separately excited DC motor using and IGBT or MOSFET chopper
8. Speed control of DC motor using single semi converter
9. Speed control of a stepper motor
10. Speed control of universal motor using AC voltage controller
11. MOSFET or IGBT based single phase full bridge inverter connected to R load
12. Study of commutation using LC circuits and auxiliary circuits

V Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F5100	Control Engineering	HC	3	2	1	0	4
2	BTEE15F5200	Transmission and Distribution	HC	4	3	1	0	5
3	BTEE15F5300	Signals and Systems	HC	3	2	1	0	4
4	BTEE15F5400	Electrical Machines II	HC	3	2	1	0	4
5	BTEE15F5501	Electrical Power Utilization	SC	4	3	1	0	5
	BTEE15F5502	Electrical Drives						
	BTEE15F5503	Digital system design using VHDL						
	BTEE15F5504	Computer Networks Concepts and Protocols						
6	BTEE15F5601	Design of Electrical Machines	SC	4	3	1	0	5
	BTEE15F5602	Advanced Power Electronics						
	BTEE15F5603	Programmable Logic Controllers						
	BTEE15F5604	Programming in Java						
7	BTEE15F5700	Electrical Machines Laboratory I	HC	2	1	0	1	3
8	BTEE15F5800	Electrical and Electronics Measurements Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**25**	**17**	**6**	**2**	**33**

Sub Code:BTEE15F5100	**Control Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To understand the methods of representation of systems and to desire their transfer function models reduction of block diagrams. 2. To provide adequate knowledge in the time response of systems and steady state error analysis, different types of controller. 3. To accord basic knowledge in obtaining the open loop and closed–loop frequency responses of systems & to understand the concept of stability of control system and methods of stability analysis. 4. To study the three ways of designing compensation for a control system and state space analysis					
Course Outcomes	On completion of this course the students will be able to: 1. Identity the applications of close loop and open loop systems and time variant and invariant systems. 2. Describe the controller application and time domain analysis. 3. Differentiate between time and frequency analysis and to determine stability by using different methods. 4. Analyze the system stable and unstable conditions and to design the compensation networks by identifying the error in the system					

COURSE CONTENTS

Unit 1: Modeling of control system and their representations [10hrs]

Basic elements in control systems – classification of systems, Open and closed loop systems – Electrical analogy of mechanical systems –Syn chros – types of servomotors

Block diagram: Block diagram representation, reduction techniques – Signal flow graphs.

Unit 2: Time response and controller characteristics [11hrs]

Time response – Time domain specifications – Types of test input – I and II order system response –Effect of adding zero to second order system steady state Error & coefficients

Controllers: Classification of controllers-P, PI, PID modes of feedback control, effect of integral and derivative control on the system performance.

Unit 3: Frequency response and stability analysis [11Hrs]

Frequency response – -advantages of frequency domain analysis- Bode plot, Relative and absolute stability, Frequency response of closed loop system.

Stability analysis: Characteristics equation – Location of roots in S plane for stability – Routh Hurwitz criterion – Root locus construction – Effect of pole, zero addition – Gain margin and phase margin.

Unit 4: State space analysis of control system & compensation techniques [10Hrs]

State space representation electrical mechanical systems, transfer matrix, computation of state transition matrix, controllability and observability

Compensation techniques: Types of compensation, design of compensation using bode plot

Text books:

1. I.J. Nagrath and M. Gopal, 'Control Systems Engineering', New Age International Publishers, 2003.
2. Syed hasan saeed, 'Automatic control systems', publishers of engineering and computer books, new Delhi, 6th edition,2012.
3. Benjamin C. Kuo, 'Automatic Control systems', Pearson Education, New Delhi, 2003.

Reference Books:

1. K. Ogata, 'Modern Control Engineering', 4th edition, PHI, New Delhi, 2002.
2. Norman S. Nise, 'Control Systems Engineering', 4th Edition, John Wiley, New Delhi, 2007.
3. Samarajit Ghosh, 'Control systems', Pearson Education, New Delhi, 2004
4. M. Gopal, 'Control Systems, Principles and Design', Tata McGraw Hill, New Delhi, 2002.

Sub Code: BTEE15F5200	**Transmission and Distribution**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. Provide detailed information about the need of power transmission & distribution and the components involved in the process. 2. Provide information of conductors & insulators which will be used for the transmission. 3. Provide information about the losses that occur during transmission and the ways of reducing the same. 4. Explain the line parameters & constants associated with transmission lines & calculation of the same and to provide the information regarding power distribution, types of distribution systems & the terms relating to distribution					
Course Outcomes	On completion of this course the students will be able to: 1. Understand the general layout of transmission and distribution of electrical system along with equipment. 2. Calculate and select the appropriate size of conductors and insulators for transmission & distribution system. 3. Compute the transmission and distribution losses and understand the various ways of reducing these losses. 4. Understand the different types of transmission and distribution systems with their merits and de-merits. 5. Identify the application of underground cables for various applications					

COURSE CONTENTS

Unit 1: **[12hrs]**

Typical Transmission & Distribution System:

Introduction, general layout of power system scheme, Standard voltages for transmission, advantages of high voltage transmission, Transmission line efficiency & line drop, Feeders, Distributors & Service mains.

Overhead Transmission Lines:

Types of supporting structures & line conductors used**,** Sag calculation- Supports at same level, Supports at different levels, Effect of wind & ice on sag calculation, Stringing chart, Sagtemplate & Vibrators, Problems on sag calculation.

Unit 2: **[9hrs]**

Insulators:

Introduction, Materials used, Types**,** Potential Distribution over suspension insulators, String efficiency, Methods to improve string efficiency, Grading rings, Arching horns, Testing of Insulators, Problems.

Corona:

Introduction, Phenomenon of corona, Disruptive & Critical voltages, Power loss due corona, Advantages & Disadvantages of corona, Problems

Unit 3: **[15hrs]**

Line Parameters:

Introduction, Calculation of inductance of single phase line, 3phase lines with equilateral spacing, Unsymmetrical Spacing, transposed lines, Inductance of composite conductor lines, Capacitance of single phase line, 3 phase lines with equilateral spacing, 3 phase lines with unsymmetrical spacing, Problems.

Performance of transmission lines:

Introduction, Short transmission lines, Medium transmission lines- Nominal T & Π method, End condenser method, Long transmission lines, ABCD constants of transmission lines, Ferranti Effect, Line regulation, Problems.

Unit 4: **[6hrs]**

Distribution:

Introduction, Requirements of power distribution, Radial & ring main systems, AC Distribution, Calculation for concentrated loads & uniform loading

Underground Cables:

Introduction, types, materials used for underground cables, Insulation resistance, thermal rating of cables, Charging current, Grading of cables, Capacitance grading & Intersheath grading, Testing of cables

Text Books:

1. Soni Gupta & Bhatanagar, "A Course of Electrical Power", DhanpatRai& Sons (New Delhi)
2. C. L. Wadhwa "Electrical Power Systems", Wiley Eastern.

Reference Books:

1. W D Stevenson, 'Elements of Power System Analysis', TMH,4th edition
2. S M Singh, 'Electric Power Generation Transmission & Distribution, PHI, 2nd Edition, 2009
3. Dr S L Uppal, 'Electrical Power', Khanna Publications

Sub Code: BTEE15F5300	**Signals and Systems**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. Understanding the fundamental characteristics of signals and systems. 2. Understanding signals and systems in terms of both the time/space and transform domains, taking advantage of the complementary insights and tools that these different perspectives provide 3. Development of the mathematical skills to solve problems involving convolution, filtering, modulation and sampling. 4. Make basic use of professional tools such as Matlab for signal and system analysis					
Course Outcomes	After the completion of the course the student will be able to: 1. Understand general signals and system properties and linear and time-invariant systems 2. Understand convolution sum and integral 3. Understand time and frequency domain representation of linear signals and systems 4. Perform Discrete-time (DT) and Continuous-time (CT) Fourier Transforms 5. Understand Fourier Transform Properties Filtering of CT and DT signals					

COURSE CONTENTS

Unit 1: Introduction [12hrs]

Definitions of signals and a system, classification of signals, basic operations on signals, elementary signals viewed as interconnections of operations, properties of systems.

Unit 2 : Time Domain Representations for LTI Systems [10hrs]

Convolution, impulse response, properties, solution of differential and difference equations,block diagram representation.

Unit 3: Fourier Series and Fourier Transform Representation [10hrs]

Introduction, Fourier representation of continuous-time periodic signals (FS), properties of continuous-time Fourier series. Fourier transform representation of a continuous-time Fourier transforms (FT), the discrete time Fourier transform (DTFT)

Unit 4: Z- Transforms [10hrs]

Introduction, Z-transform, properties of ROC, properties of Z-transforms, inversion of Z-transform methods - power series and partial expansion, Transforms analysis of LTI systems, transfer function, stability and causality, unilateral Z-transform and its application to solve difference equations.

Text Books:

1. Simon Haykin and Barry Van Veen, 'Signals and Systems', John Wiley & Sons, 2nd edition, 2008
2. Michel J Roberts, 'Fundamentals of Signals and Systems ', TMH, 2nd Edition, 2010.
3. P.Ramesh Babu, 'Signals and systems ', Scitech Publications , 4th Edition, 2011.

Reference Books:

1. Alan V Oppenheim, Alan S. Willsky and S. Hamid Nawab, 'Signals and Systems', PHI, 2nd edition, 2009.
2. H P Hsu and others, 'Signals and Systems' , Schaums Outline Series, TMH, 2nd Edition, 2008

Sub Code:BTEE15F5400	**Electrical Machines –II**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To gain knowledge about the principle of converting electrical energy to mechanical energy and vice-versa through electromagnetic field 2. To have good understanding of physical concepts and					

	operational features of DC and synchronous machines. 3. To equip the students with basic experimental skills for handling problems associated with electrical machines 4. To provide basis for further study of electrical machines
Course Outcomes	On completion of this course the students will be able to: 1. Reveal their knowledge and understanding of electromechanical energy conversion in DC and synchronous machines 2. Analyze the concepts of fundamental torque equation and rotating fields 3. Analyze the fundamental characteristics of DC and synchronous machines 4. Interpret experimental results and correlate them with theoretical predictions

COURSE CONTENTS

Unit 1: Principles of Electro-Mechanical Energy Conversion and DC Generators

[12hrs]

Introduction, Flow of Energy in Electromechanical Devices, Energy in magnetic systems (defining energy & Co-energy) , Singly Excited Systems; determination of mechanical force, mechanical energy, torque equation , Doubly excited Systems; Energy stored in magnetic field, electromagnetic torque , torque in machines with cylindrical air gap . Construction of DC Machines, Armature winding, Emf and torque equation, Armature Reaction, Commutation, Interpoles and Compensating Windings, Performance Characteristics of D.C. generators,

Unit 2 : D.C. Motors **[12hrs]**

PrincipleMand Construction, Significance of Emf and torque equation, Performance Characteristics of D.C. motors, Starting of D.C. motors; 3 point and 4 point starters , Speed control of D.C. motors: Field Control, armature control and Voltage Control (Ward Lenonard method); Efficiency and Testing of D.C. machines (Hopkinson's and Swinburn's Test).

Unit-3 : Synchronous Machine I **[12hrs]**

Constructional features, Armature winding, EMF Equation, Winding coefficients, equivalent circuit and phasor diagram, Armature reaction, O. C. & S. C. tests, Voltage Regulation using Synchronous Impedance Method, MMF Method, Potier's Triangle Method, Parallel Operation of synchronous generators, operation on infinite bus, synchronizing power and torque co-efficient

Unit 4 : Synchronous Machine II **[12hrs]**

Two Reaction Theory, Power flow equations of cylindrical and salient pole machines, operating characteristics Synchronous Motor, Effect of varying field current at different loads, V- Curves, Hunting & damping, synchronous condenser, reluctance motor

Text Books:

1. I.J. Nagrath & D.P.Kothari, 'Electrical Machines', Tata McGraw Hill
2. Husain Ashfaq , 'Electrical Machines', Dhanpat Rai & Sons
3. A.E. Fitggerald, C.Kingsley Jr and Umans, 'Electric Machinery' 6th Edition McGraw Hill, International Student Edition.
4. P.S.Bimbhra, 'Electrical Machinery', Khanna Publisher

Reference Books:

1. P.S. Bimbhra, 'Generalized Theory of Electrical Machines', Khanna Publishers
2. M.G. Say, 'Alternating Current Machines', Pitman & Sons
3. B.R. Gupta & Vandana Singhal, 'Fundamentals of Electrical Machines', New Age International.
4. Irving L. Kosow, 'Electric Machine and Transformers', Prentice Hall of India

Sub Code: BTEE15F5501	Electrical Power Utilization	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	1. To enable students to understand the advantages of utilization of electricity. 2. To give an insight into various industrial applications of electricity					
Course Outcomes	On completion of this course the students will be able to: 1. Be able to think innovatively for other ways of producing electricity. 2. Be able to propose efficient methods to the industries with the usage of electricity					

COURSE CONTENTS

Unit 1: Electric Traction **[12hrs]**

Introduction, requirements of an ideal traction, systems of traction, speed time curve, tractive effort, co-efficient of adhesion, selection of traction motors, method of speed control, energy saving by series parallel control, ac traction equipment. AC series motor, characteristics, regenerative braking, linear induction motor and their use. AC traction, specific energy, factors affecting specific energy consumption.

Unit 2: **[12hrs]**

Introduction to Electric and Hybrid Vehicles: Configuration and performance of electrical vehicles, traction motor characteristics, tractive effort, transmission requirement, vehicle performance and energy consumption.

Electrolytic Process: Fundamental principles, extraction, refining of metals and electroplating. Factors affecting electro deposition process, power supply for electrolytic process.

Illumination: Laws of illumination, lighting calculation, factory lighting, flood lighting, street lighting, different types of lamps-incandescent, fluorescent, vapor, CFL and LED lamps and their working, comparison, Glare and its remedy.

Unit 4: Heating and Welding **[12hrs]**

Advantages and methods of electric of heating, resistance ovens, induction heating, dielectric heating, the arc furnace, heating of building. Electric welding, resistance and arc welding, control devices and welding equipment.

Text Books :

1. E Openshaw Taylor, 'Utilization Of Electric Energy', 12th Impression, 2009, Universities Press.
2. Mehrdad, Ehsani, Yimin Gao, Sabastien. E. Gay, Ali Emadi, 'Modern Electric, Hybrid Electric and Fuel Cell Vehicles', CRC Press.

Reference Books:

1. Soni Gupta and Bhatnager, 'A Course in Electrical Power', Dhanapat Rai & Sons.
2. Dr. S.L.Uppal, 'Electrical Power', Khanna Publications

Sub Code: BTEE15F5502	**Electrical Drives**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To understand the basics of electrical drive system 2. To Develop mathematical models of a drive (DC) system. 3. To understand the control aspects of electrical drives					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the structure of a drive system and their role in any application. 2. Develop mathematical models using transfer functions for a DC motor 3. Analyze the given specifications and suggest a suitable motor for a particular application (like elevator system, escalator system, electric vehicle) 4. Select a power electronic converter and decide its operational parameters for DC & AC motor drive system					

COURSE CONTENTS

Unit 1: Basic Elements of Electrical Drives [14hrs]

Components of electrical Drives – electric machines, power converter, controllers - dynamics of electric drive - torque equation - equivalent values of drive parameters- components of load torques types of load - four quadrant operation of a motor — steady state stability – load equalization – classes of motor duty- determination of motor rating.

Unit 2: DC Motor Drives [10hrs]

Starting methods, Braking- Regenerative, Dynamic, Plugging related problems, method of

armature voltage control, ward Leonard drives

Unit 3: Speed Control of DC Drives [16hrs]

Different types of controlled rectifier circuits and their operation- controlled rectifier fed dc drives, 1-ph fully controlled rectifier control of dc separately excited motor, 3-ph fully controlledrectifier control of dc separately excited motor, chopper control of separately excited motor, supply harmonics, power factor, and ripple in motor current, simulation of chopper controlled DC drive in SIMULINK

Unit 4: Induction Motor Drives [16hrs]

Speed-Torque characteristics. For braking- regenerative, dynamic, plugging soft start, stator voltage control, performance of induction motor under unbalanced supply and single phasing, variable frequency control, slip speed control. Induction motor slip power recovery drives, Static Kramer drive

Text Books:

1. G.K.Dubey, 'Power semiconductor controlled drives', Prentice Hall, 1989
2. P.C.Sen, 'Principles of Electric Machines and Power Electronics', John Wiley & Sons, 2nd Edition, 1996.

References:

1. P.C.Sen, 'Principles of Electric Machines and Power Electronics', John Wiley & Sons, 2nd Edition, 1996.
2. Vedam Subrahmaniam, 'Electric Drives', TMH, 1994
3. R. Krishnan, 'Electrical Motor Drives', PHI, 2003
4. Bimal. K.Bose, 'Modern Power Electronics and AC Drives', Pearson Education
5. Introduction to Electrical Drives: http://textofvideo.nptel.iitm.ac.in/video.php?courseId=108108077

Sub Code: BTEE15F5503	**Digital System Design Using VHDL**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To demonstrate an understanding of the fundamentals for an HDL. 2. To demonstrate an understanding of data flow descriptions. 3. To implement combinational and sequential circuits using					

	VHDL. 4. To implement various digital circuits using Programmable Logic Devices. 5. Design of State Machines
Course Outcomes	On completion of this course the students will be able to: 1. Compare Verilog HDL and VHDL. 2. Design simple logic circuits using data flow, structural and behavioral modelling concepts. 3. Implement combinational and sequential circuits. 4. Realize State Machine Charts for various applications

COURSE CONTENTS

Unit 1: **[12hrs]**

Introduction: A Brief History of HDL, Structure of HDL Module, Operators, Data types, Types of Descriptions, simulation and synthesis, Comparison of VHDL and Verilog.

Data –Flow Descriptions: Data-Flow Description, Structure of Data-Flow Description, Data Type – Vectors.

Unit 2: **[12hrs]**

Behavioral Modelling: Behavioral Description, structure of HDL behavioral Description, The VHDL variable –Assignment Statement, sequential statements.

Structural Modelling: Structural Description, Organization of the structural Descriptions, Binding, state Machines, Generate, Generic, and Parameter statements.

Unit 3: **[12hrs]**

Combinational and Sequential Circuit Design: VHDL Models and Simulation of combinational circuits-Multiplexers, Demultiplexers, encoders, decoders , code converters, comparators, implementation of Boolean functions. VHDL Models and Simulation of SequentialCircuits Shift Registers, Counters

Unit 4: **[12hrs]**

Designing with programmable logic devices: Read-only memories, Programmable logic arrays (PLAs), Programmable array logic (PALs), Other sequential programmable logic devices (PLDs).

Digital Design With SM Charts: State machine charts, Derivation of SM charts, Realization of SM charts. Implementation of the dice game, Alternative realization for SM charts using microprogramming, Linked state machines.

Text Books :

1. Charles H. Roth. Jr, 'Digital Systems Design Using VHDL', Cengage, 2010.
2. A Pedroni, Volnet, 'Digital Electronics and Design With VHDL', Elsevier, 1st edition, 2008
3. Brown and Vranesic, 'Fundamentals of Digital Logic with VHDL Design', McGraw Hill, 3rd Edition 2008.

Reference Books:

1. Stephen Brwon & Zvonko Vranesic, 'Fundamentals of Digital Logic with VHDL Design', TMH, 2nd Edition 2006
2. Floyd, 'Digital Fundamentals using VHDL', Pearson Education, 2003
3. Wakerly J. F., 'Digital Design – Principles and Practices', 4th Edition, Pearson Education,2008.
4. Navabi, 'Vhdl Modular Design', McGraw Hill, 2008

Sub Code: BTEE15F5504	**Computer Networks Concepts and Protocols**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. Describe the concept of Protocol Stacks (OSI and TCP/IP), data communication with packet switching and virtual circuit networks. 2. Give knowledge about network topologies and Ethernet standards 3. Explain various media access techniques, error detection and correction mechanisms 4. Familiarize the students with routing and error reporting protocols 5. Gain expertise in transport layer and application layer standards and protocols					
Course Outcomes	On completion of this course the students will be able to: 1. Use protocol stacks (OSI and TCP/IP) for developing data communication applications 2. Apply error detection & correction strategies for data transmission 3. Establish network of computing devices using topology and Ethernet standards 4. Experiment routing protocols and error reporting protocols 5. Design and develop communication applications using TCP/UDP standards					

COURSE CONTENTS

Unit 1: **[10hrs]**

Introduction to Data Communication and Networking: Internet history and Internet today, Data Communications, Networks, Protocols & Standards, Layered Tasks, The OSI model, Layers in OSI model, TCP/IP Protocol suite, Addressing. Introduction to switching: Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks. (Ch.1.1, 1.2, 1.3, 1.4, 21, 2.2, 2.3, 2.4, 2.5, 8.1, 8.2, 8.3)

Unit 2: **[10hrs]**

Concepts of Multiplexing, FDM, WDM, TDM, Line coding methods, Digital Modulation techniques, **Networking Devices:** Digital Subscriber Line Modems, Cable Modems, Repeaters, Hubs, Bridges, Routers, and High layered switches, Gateways.

Error Detection and Correction: Introduction, cyclic Codes: Cyclic redundancy code generation for checksum. Frames, Packets, Point-to-Point Protocol, CSMA/CD, CSMA/CA, Controlled Access: Reservation, Polling, Token passing.

Unit 3: **[10hrs]**

Network Topologies, Classification of Networks, Protocols, PPP, IEEE Standards, Standard Ethernet, Fast Ethernet, Gigabit Ethernet, IEEE 802.11, Architecture, MAC Sublayer,Addressing Mechanism. IPv4 addresses, IPv6 addresses, transition from IPv4 to IPv6.

Unit 4: **[10hrs]**

Standards and Protocols: User Datagram Protocol (UDP): UDP Segment, Transmission Control Protocol (TCP): TCP Segment, Connection Set up, Application of TCP and UDP. TCP Congestion Control.

Domain Name System (DNS): Name/Address Mapping, DNS Message Format. Remote Login Protocols: TELNET Protocol and SSH Protocol. Electronic Mail (E-Mail), World Wide Web (WWW).

Basic concepts of FTP, GSM, LTE, MPLS, VPN, ATM, Bluetooth. WiFi, WiMax.

Text Books:

1. Behrouz A Forouzan, 'Data Communications and Networking', 4th Edition, McGraw – Hill, 2006
2. Nader F. Mir, 'Computer and Communication Networks', Pearson Education, 2009

Sub Code: BTEE15F5601	Design of Electrical Machines	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	1. To enable students to understand the application of basic electro-magnetic laws. 2. To give an insight into constructional details of internal parts of the machines					
Course Outcomes	On completion of this course the students will be able to: 1. Be able to apply basic electro-magnetic laws to mould the laboratory modules. 2. Be able to select efficient materials for the best performance of the machine					

COURSE CONTENTS

Unit 1: **[14hrs]**

Basics of Electrical Machine Design:

Introduction, considerations for the design of electrical machines, limitations. Different types of materials and insulators used in electrical machines.

DC Generator and DC Motor Design:

Output equation, choice of specific loadings and choice of number of poles, design of Main dimensions of the DC machines, Design of armature slot dimensions, commutators and brushes, magnetic circuit - estimation of ampere turns, design of yoke and poles- main and inter poles, field windings – shunt, series and inter poles.

Unit 2: Single Phase and Three Phase Transformers Design **[14hrs]**

Output equation for single phase and three phase transformers, choice of specific loadings, expression for volts/turn, determination of main dimensions of the core, types of windings and estimation of number of turns and conductor cross sectional area of Primary and secondary windings, estimation of no load current, expression for leakage reactance and voltage regulation. Design of tank and cooling tubes (round and rectangular)

Unit 3: Three Phase Induction Motor Design **[14hrs]**

Output equation, Choice of specific loadings, main dimensions of three phase induction motor, Stator winding design, choice of length of the air gap, estimation of number of slots for the squirrel cage rotor, design of rotor bars and end ring, design of slip ring induction motor, estimation of no load current and leakage reactance, and circle diagram.

Unit 4: Synchronous Machines **[14hrs]**

Output equation, Choice of specific loadings, short circuit ratio, design of main dimensions, armature slots and windings, slot details for the stator of salient and non salient pole synchronous

machines. Design of rotor of salient pole synchronous machines, magnetic circuits, dimensions of the pole body, design of the field winding, and design of rotor of non-salient pole machine.

Text Books:

1. A.K.Sawhney, 'A Course In Electrical Machine Design', Dhanpatt Rai & Sons
2. V. N. Mittle, 'Design Of Electrical Machines', 4th edition

Reference Books:

1. M.G.Say, 'Performance And Design Of AC Machines', CBS Publishers and Distributors Pvt.Ltd.
2. R.K.Aggarwal, 'Principles of Electrical Machine Design'.
3. Shanmugasundarm, G,Gangadharan,R.Palani, 'Design Data Handbook', AWiley Eastern Ltd.

Sub Code: BTEE15F5602	**Advanced Power Electronics**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To develop analytical techniques for isolated/non-isolated converters in steady state. 2. To design and simulate a basic dc-dc power supply for given specifications. 3. To describe the operation and pulse width modulation strategies in inverters. 4. 4. To familiarize with various element of a practical power converter circuitry					
Course Outcomes	On completion of this course the students will be able to: 1. Analyze any arbitrary dc-dc converter in steady state. 2. Design the output filter components to meet the required specifications. 3. Choose the appropriate switching device based on circuit operation. 4. Identify the various blocks in a practical PWM control circuitry. 5. Apply knowledge of converters for practical applications in electrical industry					

COURSE CONTENTS

Unit 1: Switched Mode Power Conversion: DC-DC Converters [14hrs]

Introduction to power processing, Linear Regulator Vs Switching Regulator. Basics of steady state analysis- Inductor Volt-second, capacitor charge balance, small ripple approximation.

Principle of operation of buck, boost, buck-boost, Design of output filters components, selection of switch ratings. -Numerical problems

Discontinuous conduction Mode Operation: Buck and Boost converters.

Analysis using software tools: Simulation of DC-DC converters using MATLAB/LTSpice.

Unit 2: DC Power supplies [14hrs]

Switch Realization: Single-,two-, and four-quadrant switches, Selection of power semiconductor switch based on application. DC power supplies: fly back converter, forward converter, push- pull converter, half bridge converter, full bridge converter

Review of Fourier series, fundamental and harmonic voltages. Harmonics generated by SMPS power supplies, undesirable effect on power systems, power factor.

Analysis using software tools: Simulation of DC power supplies using MATLAB/LTSpice

Unit 3: Inverters and Pulse width modulation (PWM) Techniques [14hrs]

Effects of harmonic voltages. Inverters- Control of fundamental voltage, harmonic mitigation

PWM Inverters: Square wave operation, Voltage control of single phase inverters - sinusoidal PWM and its Realization, Other Popular PWM Techniques, harmonic analysis -Numerical problems. Current Source Inverter, Load-commutated Current Source Inverter (CSI)

Unit 4: Practical Aspects of Converters [14hrs]

IC based linear regulators: LM78xx series. Basics elements of PWM Control: PWM control IC and its components, Need for Driver circuit, isolation techniques. Application of DC-DC converters-Power factor correction, solar power application. Applications of inverters- Design of UPS, Grid tied PV system.

Text Books:

1. Daniel Hart, 'Power Electronics', Tata McGraw Hill, 2011
2. Ned Mohan Tore. M. Undeland and William. P. Robbins, 'Power Electronics: Converters, Applications and Design', John Wiley and Sons, 2011
3. Rashid M.H., 'Power Electronics – Circuits Devices and Applications', 3rd Edition, Pearson, 2011.
4. L. Umanand, 'Power Electronics: Essentials and Applications', Wiley India Pvt. Ltd.

Reference Books:

1. Robert W. Erickson and Dragon Maksimovic, 'Fundamentals of Power Electronics', Springer International edition.
2. D.M. Mitchell, 'DC-DC Switching Regulator Analysis', McGraw Hill

Sub Code: BTEE15F5603	**Programmable Logic Controllers**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To provide knowledge levels of PLC programming 2. To train the students for creating ladder logic for PLC processes programming. 3. To apply the knowledge of Timers and Counters for Industrial applications					
Course Outcomes	On completion of this course the students will be able to: 1. Ability to gain knowledge on Programmable Logic Controllers. 2. To provide the knowledge about various types of registers in PLC. 3. Able to create the ladder diagrams from process and control descriptions					

COURSE CONTENTS

Unit 1: **[10hrs]**

PLC Basics: PLC system, Internal architecture I/O modules and interfacing, CPU processor, programming Equipment, programming formats, construction of PLC ladder diagrams, Devices connected to I/O modules.

Unit 2: **[10hrs]**

PLC Programming: Input Devices: Mechanical switches, Proximity switches, Photoelectric sensors and switches; Temperature sensors, position / Displacement sensors; Strain gauge sensors; Pressure sensors; Liquid level detectors; Fluid flow measurement ; Smart sensors;Outputs Devices : Relay; Directional control valves; Motors ; Stepper motors; Operational procedures, programming examples and PLC applications.

Unit 3: **[10hrs]**

Digital logic gates, programming in the Boolean algebra system, conversion examples Ladder Diagrams for process control: Ladder diagrams & sequence listings, ladder diagram construction and flowchart for spray process system.

Unit 4: **[10hrs]**

PLC Registers: Characteristics of Registers, module addressing, holding registers, Input Registers, Output Registers.

PLC Functions: Timer functions & Industrial applications, counters, counter function industrial applications, Arithmetic functions, Number comparison functions, number conversion functions

Analog PLC operation: Analog modules& systems, Analog signal processing, Multi bit Data Processing, Analog output Application Examples, PID principles, position indicator with PID control, PID Modules, PID tuning, PID functions.

Text Books:

1. John W. Webb & Ronald A. Reiss, 'Programmable Logic Controllers- Principles and Applications', Fifth Edition, PHI
2. J R.Hackworth &F.D Hackworth Jr., 'Pogrammable Logic Controllers- Programming Method and Applications', Pearson, 2004
3. William Bolton, 'Programmable Logic Controllers', fifth Edition.

Sub Code: BTEE15F5604	**Programming in Java**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. Describe Java language syntax and semantics required for understanding Java programs (applets and applications) 2. Illustrate the usage of a Java-enabled browser and/or the applet viewer to execute Java applets along with Java Application Programming Interface and Java multi-class programs 3. Design, implement, test, and debug Java applications written using basic concepts such as primitive data types, various operators, control structures, single-subscripted arrays, and Java classes 4. Explain the Java applications written using applets and object-based programming techniques including classes, objects and inheritance					
Course Outcomes	On completion of this course the students will be able to: 1. Analyze the principles and concepts of object-oriented programming; 2. Use a Java-enabled browser and/or the appletviewer to execute Java applets 3. Use the Java interpreter to run Java applications 4. Apply object oriented concepts; such as inheritance; polymorphism; abstract classes and interfaces; and packages in program design.					

	5. Describe, modify and debug Java programs using primitive data types, various operators, control structures, single-subscripted arrays, multi-class and object-based programming techniques including classes, objects and inheritance

COURSE CONTENTS

Unit 1: **[12hrs]**

Primitive Data Types and Arithmetic: Data, Data Storage, Identifiers, Syntax, Variables and Constants, the Format of a Simple Program, Arithmetic, Operator Precedence, Casting,

Objects: Introduction to Objects, The String Class, The Anatomy of a Simple Program Revisited, The AVI Package, The Window Class, Input to a Dialog Box, Converting Strings to Numbers, Command Line Arguments, Errors

Unit 2: **[12hrs]**

Object-Oriented Programming: Abstract Data Type, Constructors, Instance Methods, Class Methods, Scope and Lifetime of Identifiers, Software Development, Object-Oriented Program Design, the AVI Package Revisited

Selection: More AVI Classes, If..else Statement, Nested If Statement, Conditional Expressions, Else if Statements, Boolean Data Type, Switch, Wrapper Classes, Yet another AVI Class!, The This Object.

Unit 3: **[12hrs]**

Repetition and One-Dimensional Arrays: Loop Structure, While Loop, Do..while Loop, Increment/Decrement Operators, For Loop, Which Loop?, Arrays Revisited, Declaring and Initializing One-Dimensional Arrays, Using Arrays, Our Last AVI Class: CheckBoxes, Formatting Numbers for Output

Advanced Concepts with Classes: Inheritance, An Example of Inheritance, Overriding Superclass Methods, Polymorphism, Instanceof Operator, Shadowed Variables, Inner Classes, Abstract Methods and Classes, Interfaces, Constructors Revisited, Instance Methods Revisited, Object Properties, Comparing Objects, Copying Objects, Passing Objects as Parameters, Garbage Collection and Object Finalization

Unit 4: **[12hrs]**

Exceptions and Streams: Introduction, Exception Classes, Catching an Exception, Catching Multiple Exceptions, Creating Your Own Exception Class, Throwing an Exception, FinallyBlocks, Using Exception Handling, Stream Input and Output, The Stream Tokenizer Class, Text File Processing, The File Dialog,

Applets and Threads: Introduction, Applets, Input to Applets, Playing Sounds, Displaying Images, Loading Images, Arrays Revisited, Image Maps, Threads, Animation, Restrictions,Sound and Images with Applications

Text Books:

1. Barry J. Holmes and Daniel T. Joyce, 'Object-Oriented Programming With Java', second Edition, Jones and Bartlett Publishers,2000
2. Dale Skrien, 'Object-Oriented Design Using Java', McGraw-Hill Higher Education, 2009
3. Danny Poo, 'Object-Oriented Programming and Java', Second Edition, Springer, 2008

References:

1. Cay Horstmann, 'Big Java',2nd Edition, John Wiley and Sons
2. Herbert Schildt, 'The Complete Reference Java J2SE', 5th Edition, TMH Publishing Company Ltd, New Delhi
3. H.M.Dietel and P.J.Dietel, 'Java: How to Program', Sixth Edition, Pearson Education/PHI
4. Cay. S. Horstmann and Gary Cornell, 'Core Java 2, Vol 1, Fundamentals', Seventh Edition, Pearson Education/PHI
5. Iver Horton, 'Beginning in Java 2', Wrox Publications

Sub Code: BTEE15F5700	**Electrical Machines Laboratory - I**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Wks		**2**	**1**	**0**	**1**	**3**
Course Objectives:	1. Learn different types of electromechanical energy conversion devices and their operating principles. 2. Judge the performance of a given machine through testing. 3. Comprehend the construction and speed control techniques for different types of D.C machines. 4. Evaluate the various characteristics of ac machines for industrial applications.					
Course outcomes	At the end of this course, Student will be able to 1. Apply the three phase transformer in the industrial needs like electrical drives and agricultural pumps etc. 2. Understand parallel operation of transformer, three phase transformer, auto transformer and their practical applications. 3. Analyze equivalent circuits of three phase transformers. 4. Understand the different testing methods for evaluating the various losses of the transformers					

List of lab experiments:

1. (a) Predetermination of efficiency and regulation by Open Circuit and Short circuit tests on single - phase transformer.
   (b) Calculation of parameters of equivalent circuit from the readings of the tests and

determination of efficiency and regulation from the equivalent circuit to correlate results obtained earlier.

2. Sumpner's test on similar transformers and determination of combined and individual transformer efficiency.
3. Parallel operation of two dissimilar (different kVA) single-phase transformers and determination of load sharing and analytical verification given the Open Circuit and Short circuit tests details.
4. Polarity test and connection of 3 single-phase transformers in star – delta and determination of efficiency and regulation under balanced resistive load.
5. Scott connection with balanced and unbalanced resistive loads.
6. Load test on 3-phase induction motor- and plot of Torque versus speed, output hp versus efficiency, power factor and slip.
7. Predetermination of performance of 3-phase induction Motor from the Circle diagram.
8. (a) Determination of parameters of the equivalent circuit of a 3-phase Induction Motor by conducting NO load and Blocked rotor tests.
   (b) Determination of performance quantities of the induction motor from the equivalent circuit to correlate the results obtained from the load test or circle diagram.
9. Speed control of 3-phase induction motor by varying rotor resistance.
10. Load test on single- phase induction motor

Sub Code: BTEE15F5800	Electrical and Electronics Measurement Laboratory	C	L	T	P	CH
Duration :14 Weeks		**2**	**1**	**0**	**1**	**3**
Course objectives	1. To understand the working of various electrical bridge 2. To understand the energy meter 3. To know the working of Op-amps					
Course outcomes	At the end of this course, Student will be able to 1. Measure various parameters of given bridge 2. To apply the Op-amps in various signal processing circuits					

List of lab experiments:

1. Measurements of low resistance using Kelvin's Double Bridge.
2. Measurements of inductance using Maxwell inductance Capacitance bridge & determination of Q factor.
3. Measurements of capacitance using De-sauty's bridge & determination of dissipation factor.
4. Measurement of active and reactive power in balanced 3 phase circuit using two watt meter method.
5. Adjustment & Calibration of single phase energy meter.
6. Inverting, non-inverting & scale charging of signals using Op amps (using simulation Packages)
7. RC phase shifting oscillator using op amps(using simulation Packages)
8. RC coupled amplifier – frequency response for variation of bias & coupling using simulation packages.
9. Rectifier circuits – Bridge rectifier, diode clipping & clamping circuits using simulation package.
10. Schmitt – Trigger inverting and non-inverting

VI Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F6100	Power System Analysis	HC	4	3	1	0	5
2	BTEE15F6200	High Voltage Engineering	HC	4	3	0	1	5
3	BTEE15F6300	Theory and Applications of Linear Integrated Circuits	HC	3	2	1	0	4
4	BTEE15F6401	Advanced Control Engineering	SC	3	2	1	0	4
	BTEE15F6402	Digital Relays						
	BTEE15F6403	Embedded systems and IOT						
	BTEE15F6404	DBMS						
5	BTEE15F6501	Power System Planning and Reliability	SC	3	2	1	0	4
	BTEE15F6502	Modeling and Simulation of Electrical Machines						
	BTEE15F6503	Operation Research						
	BTEE15F6504	Web Programming						
6	BTEE15F6601	Smart grid	SC	4	3	1	0	5
	BTEE15F6602	Digital Signal Processing						
	BTEE15F6603	VLSI Circuits and Design						
	BTEE15F6604	Data Structures using C++						
7	BTEE15F6700	Electrical Machines Laboratory II	HC	2	1	0	1	3
8	BTEE15F6800	Control System Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**25**	**19**	**5**	**3**	**33**

Sub Code: BTEE15F6100	**Power System Analysis**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To model the power system under steady state operating condition. To apply efficient numerical methods to solvethe power flow problem. 2. To model and analyze the power systems under abnormal (or) fault conditions. 3. To model and analyze the transient behavior of power system when it is subjected to a fault					
Course Outcomes	At the end of this course, Student will be able to 1. Carry out the fault analysis of transmission and distribution networks. 2. Computation of short circuit capacity analysis 3. Build the impedance matrix algorithms from which the power flow and losses can be estimated					

Unit 1: Introduction to Power System **[14hrs]**

Modern Power System – basic components of a power system. Generator model, transformer model, transmission system model and load representation. Single line diagram – per phase and per unit representation – change of base..

Unit 2: Network Matrices **[14hrs]**

Introduction, Importance of Y-Bus matrix and Z- Bus matrix in Power System Analysis, formation of Y- Bus matrix and Z- Bus matrix , formation of YBUS by method of inspection (including transformer off-nominal tap setting) and method of singular transformation (YBUS = $A^T YA$), Formation of Bus Impedance matrix by step by step building algorithm

Unit 3: Fault Analysis – Balance Faults **[14hrs]**

Importance short circuit (or) for fault analysis – basic assumptions in fault analysis of power systems. Symmetrical (or) balanced three phase faults – problem formulation – fault analysis using Z-bus matrix – algorithm and flow chart. Computations of short circuit capacity, post fault voltage and currents.

Unit 4: Fault Analysis – Unbalanced Faults **[14hrs]**

Introduction to symmetrical components – sequence impedances – sequence networks – representation of single line to ground, line to line and double line to ground fault conditions. Unbalanced fault analysis – problem formulation – analysis using Z-bus impedance matrix – (algorithm and flow chart)

Text Books:

1. Hadi Saadat, 'Power System Analysis', Tata McGraw Hill Publishing Company, New Delhi, 2002.
2. Olle. I. Elgerd, 'Electric Energy Systems Theory – An Introduction', Tata McGraw Hill Publishing Company Limited, New Delhi, Second Edition, 2003.

References:

1. P. Kundur, 'Power System Stability and Control, Tata McGraw Hill, Publications,1994.
2. John J. Grainger and W.D. Stevenson Jr., 'Power System Analysis', McGraw Hill International Book Company, 1994.
3. I.J. Nagrath and D.P. Kothari, 'Modern Power System Analysis', Tata McGraw-Hill Publishing Company, New Delhi, 1990.

Sub Code: BTEE15F6200	High Voltage Engineering	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	1. To enable the students understand various breakdown mechanisms. 2. To enable the students understand various principles of generating high DC, AC and impulse voltages. 3. To teach the students about various methods for measuring high voltages and currents. 4. To teach the students various high voltage tests performed on various electrical apparatus such as cables, insulators etc.					
Course Outcomes	After the completion of the course the student will be able to: 1. Describe the principles of the generation and measurement of high voltage AC, DC and impulse voltages. 2. Describe the fundamentals of breakdown. 3. Understand discharge phenomena, to prevent them. 4. Know the origins of overvoltage and protection against them. 5. Understand insulation coordination concept					

COURSE CONTENTS

Unit 1: Over Voltages in Electrical Power Systems [10hrs]

Causes of over voltages and its effects on power system – Lightning, switching surges and temporary over voltages, need for generating high voltages in laboratory.

Electrical Breakdown in Gases, Solids and Liquids

Gaseous breakdown in uniform and non-uniform fields – Ionization process, Townsend'scurrent growth equation. Streamer theory of breakdown. Paschen's law of gases, Vacuum breakdown – Breakdown in pure and commercial liquids – Breakdown mechanisms in solid dielectrics.

Unit 2: Generation of High Voltages and High Currents [11hrs]

HVAC- Cascade connection and working of transformers units connected in cascade. Resonant circuits- principle of operation and advantages. Tesla coil.

HVDC-Voltage doubler circuit, cock croft- Walton type high voltage DC set. Calculation of high voltage regulation, ripple and optimum number of stages for minimum voltage drop.

Impulse Voltages & Currents- Impulse voltage generator, Marx Impulse circuit, Triggering methods of impulse generator. Generation of switching impulse voltages. Generation of high

impulse current.

Unit 3: Measurement of High Voltages and High Currents [**11Hrs]**

Electrostatic voltmeter-principle, construction and limitation. Generating voltmeter- Principle, construction. Standard sphere gap measurements of HV AC, HV DC, and impulse voltages.

Potential dividers, their types and applications.

Measurement of high impulse currents- Rogowsky coil and Magnetic Links.

Unit 4: [**10Hrs]**

Non-destructive High Voltage Testing:

Measurable properties of dielectrics.

Measurement of Dielectric properties with Schering Bridge and Mega ohm meter.

Insulation Coordination:

Principle of insulation coordination on high voltage and extra high voltage power systems.

Basic insulation level design systems.

Text Books :

1. M.S.Naidu and Kamaraju, 'High Voltage Engineering', 4th edition, THM, 2008.
2. E.Kuffel and W.S. Zaengl, 'High Voltage Engineering Fundamentals', 2nd edition, Elsevier Press, 2005.
3. C.L.Wadhwa, 'High Voltage Engineering' , New Age International Private limited, 1995

Sub Code: BTEE15F6300	**Theory and Applications of Linear Integrated Circuits**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**3**	**2**	**1**	**0**	**4**
Course Objectives	1. To introduce the basic building blocks of linear integrated circuits. 2. To outline the design procedure of applications using operational amplifiers, analog multipliers and PLL. 3. To study the operation of ADC and DAC 4. To introduce the concepts of waveform generation and introduce some special function ICs					
Course Outcomes	After completion of the course, the student can able to: 1. Describe the fabrication methods and characteristics of op-amp and Timer ICs					

	2. Design different applications using general purpose op- amp and application specific ICs. 3. Design multipliers and PLL, and design of applications using Timer IC

COURSE CONTENTS

Unit 1 : Basics of Op-amps [12hrs]

op-amp structure, IC-741 structure and its characteristics, features of Op-amp, Design of Non inverting and Inverting Amplifiers, differential amplifiers, Capacitor coupled voltage follower, capacitor coupled non-inverting amplifier capacitor coupled inverting amplifier, setting upper cut off frequency, capacitor coupled difference amplifier, and use of single polarity supply.

Unit 2: [12hrs]

A. Signal processing circuits: Precision half wave &full wave rectifiers, limiting circuits, clamping circuits, peak detectors, Sample & Hold Circuit, A-D and D-A converters.

B. Nonlinear circuits: Op-amps in switching circuits, crossing detectors, inverting Schmitt trigger circuits, non-inverting Schmitt circuits, Astable Multivibrator, and Monostable Multivibrator.

Unit 3: [12hrs]

A. Signal generator: Triangular/Rectangular wave generator, waveform generator design, Phase Shift Oscillator, oscillator amplitude stabilization, Wein Bridge Oscillator, signal generators output controllers.

B. Active filters: First and Second Order High Pass And Low Pass Filters, Band Pass Filter, Band Stop Filter.

Unit 4: [12hrs]

A. Specialized IC's: Universal Active Filter, Switched Capacitor Filter, Phase Locked Loops, Basics of Voltage Regulators, 721 voltage regulator.

B. Other Linear IC's: 555 timers, Architecture, Astable Multivibrator, Monostable Multivibrator

Text Books:

1. Ramakanth A Gayakwad, 'Operational amplifiers and linear IC's', Pearson, 4th edition, 2007.
2. David A Bell, 'Operational amplifiers and linear IC's', PHI

Reference Books:

1. Roy & Choudry, 'Operational amplifiers and linear IC's', New age International.
2. Stanley William D, 'Operational amplifiers and linear IC's', 4th edition, Pearson Education

Sub Code: BTEE15F6401	**Advanced Control Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To Understand the basics of mathematical modeling 2. To study the stability analysis of linear and non-linear systems 3. Develop ability to set up measurement systems with a control environment 4. Develop an ability to design and utilize advanced control systems and apply MATLAB RealTime programming to collectprocess data					
Course Outcomes	On completion of this course the students will be able to: 1. Ability to apply knowledge of advanced principles to the analysis of electrical and computer engineering problems. 2. Ability to apply knowledge of advanced techniques to the design of electrical and computer engineering systems. 3. At the end of the course students will be able apply the modeling concepts 4. Students will be equipped with stability analysis of linear and non linear systems					

COURSE CONTENTS

Unit 1: Modern Control Theory [10hrs]

Limitations of conventional control theory - Concepts of state, State variables and state model – state model for linear time invariant systems: State space representation using physical-Phase and canonical variables, Characteristic equation - Eigen values and Eigen vectors - Invarianceof Eigen values -Diagonalization - Jordan Canonical form

Unit 2: System Response [10hrs]

Transfer function from state model - Transfer matrix - Decomposition of transfer functions Direct, cascade and parallel decomposition techniques - Solution of state equation - State transition matrix computation

Unit 3: System Models [12hrs]

Concepts of controllability and observability - Kalman's and Gilbert's tests - Controllable and observable phase variable forms - Effect of pole-zero cancellation on controllability and observability.

Unit 4: Liapunov Stability **[12hrs]**

Liapunov stability analysis - Stability in the sense of Liapunov - Definiteness of Scalar Functions – Quadratic forms - Second method of Liapunov - Liapunov stability analysis of linear time invariant systems

Text Books:

1. Katsuhiko Ogata, 'Modern Control Engineering', Prentice Hall of India Private Ltd., New Delhi, Third Edition, 2002.
2. Nagrath I J and Gopal M, 'Control Systems Engineering', New Age International Publisher, New Delhi, 2006.
3. Gopal M, 'Digital Control and State Variable Methods', Tata McGraw-Hill Publishing Company Limited, NewDelhi, India, Second Edition, 2003.
4. Nise S Norman, 'Control Systems Engineering', John Wiley & Sons, Inc, Delhi, Third edition, 2000.
5. Benjamin C Kuo, 'Automatic Control Systems', John Wiley & Sons, Inc., Delhi, 2002.

References:

1. Vidyasagar .M, 'Nonlinear system analysis', Prentice Hall Inc., New Jersey 2002
2. Singiresu S. Rao, 'Applied Numerical Methods', Prentice Hall, Upper Saddle River, New Jersey, 2001.
3. Jean-Jacques E. Slotine, Weiping Li, 'Applied Nonlinear Control', Prentice Hall Inc., New Jersey, 2004.

Sub Code: BTEE15F6402	**Digital Relays**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To introduce students to power system protection using digital relays. 2. To teach students theory and applications of the digital components used in power system protection. 3. To enable the students to understand theory, construction advantages and disadvantages of various digital and numerical relays. 4. To teach the students , the theory and construction of various protective relays and their characteristics 5. To teach students the protection systems used for Power system					
Course Outcomes	On completion of this course the students will be able to:					

	1. Be able to describe the operation of digital protection system. 2. Be able to classify various types of Static, digital Relays 3. Be able to describe the theory , construction , advantages and disadvantages of different types of Relays and their applications 4. Be able to design distance protection schemes 5. Be able to differentiate electromechanical and digital relays.

COURSE CONTENTS

Unit 1: [**11hrs]**

Static Relays: Introduction, Basic construction, Classification, Basic circuits- Smoothing circuits, Voltage regulation, Square wave generator, Time delay circuits, Level detectors, Summation devices, Sampling circuits, Zero crossing detector and Output devices.

Comparators: Replica Impedance, Mixing Transformers, General equation of Phase and Amplitude comparators, Realization of ohm, mho, impedance and offset impedance characteristics, Duality principle, Static Amplitude comparators-Rectifier bridge circulation current type, Sampling comparator. Static phase comparator- coincidence type rectifier phase comparator, Block split comparator and Zener diode phase comparator.

Unit 2: **[10hrs]**

Static Over Current, Timer and Voltage Relays: Instantaneous OCR, Definite and Inverse time OCR , Static Timer Relays, Monostable delay circuits, Single phase Instantaneous over voltage and under voltage relays, Instantaneous over voltage relay using OP-Amps.

Unit 3: Distance Relays [**11hrs]**

Distance Relays : General Principle of operation, Zone discrimination, Fault area on Impedance diagram, Basic measuring elements, Different characteristics used in distance relaying- Impedance, Reactance, Admittance, Ohm. Distance relay settings, Distance measurements problems.

Unit 4: Principles of Digital and Numerical Relays **[10hrs]**

Definition of Numerical Protection system, Advantages of Numerical Relays, Block representation of Numerical Relays.

Block schematic approach of microprocessor based relays- Over current Protection, Transformer Differential Protection, Directional Relay scheme, Impedance Relay scheme.

Text Books:

1. T.S.Madava Rao, 'Power System Protection, Static Relays with Microprocessor Applications', TMH second addition, 2004
2. Badri Ram, Vishwakarma, 'Power System Protection and Switchgear', Tata McGraw Hill, 2001.

Reference Books:

1. Sunil S. Rao, 'Switchgear and Protection', Khanna publishers, New Delhi, 1986.
2. B. Ravindranath, and N. Chander, 'Power System Protection & Switchgear', Wiley Eastern Ltd., 1977.
3. Y.G. Paithankar and S.R. Bhide, 'Fundamentals of Power System Protection', Prentice Hall of India Pvt. Ltd., New Delhi–110001, 2003

Sub Code: BTEE15F6403	**Embedded Systems & IOT**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. Provide knowledge about the basics of embedded systems and embedded system design 2. Describe Internet-of-Things and design principles 3. Explain the ease of prototyping and production, and think of deployment for the community. 4. Gain expertise in integrating sensing, actuation and software 5. Give knowledge about internet principles and techniques for writing embedded code					
Course Outcomes	On completion of this course the students will be able to: 1. Explain the basics of embedded systems and design embedded systems 2. Design and Develop Internet-of-Things based applications 3. Develop prototypes of Internet-of-Things based applications, and deploy for the usage of the community. 4. Integrate sensing, actuation and software 5. Write embedded code for constrained sensor devices					

COURSE CONTENTS

Unit 1: Introduction to Embedded Systems [12hrs]

Introduction, Complex Systems and Microprocessors, Embedded Systems Design Process, Formalism for System design, Design Example: Model Train Controller, RTOS vs OS.

Unit 2: The Internet of Things: An Overview & Design Principles [12hrs]

The Flavor of the Internet of Things, The "Internet" of "Things", The Technology of the Internet of Things, Enchanted Objects, Who is Making the Internet of Things? Design Principles for Connected Devices, Calm and Ambient Technology, Magic as Metaphor, Privacy, Web Thinking for Connected Devices, Affordances.

Unit 3: Thinking about Prototyping and Prototyping Embedded Devices [12hrs]

Sketching, Familiarity, Costs versus Ease of Prototyping, Prototypes and Production, Open Source versus Closed Source, Tapping into the Community, Electronics, Arduino, Raspberry Pi, Beagle Bone Black, Electric Imp, And other Notable Platforms.

Unit 4: Internet Principles and Techniques for Writing Embedded Code [12hrs]

Internet Communications, IP Addresses, MAC Addresses, TCP and UDP Ports, Application Layer Protocols, Memory Management, Performance and Battery Life, Libraries, Debugging, Current challenges in IoT.

Text Books:

1. Wayne Wolf, 'Computers as Components: Principles of Embedded Computing System Design', 2nd Edition, Elsevier, 2008.
2. Adrian McEwen, Hakim Cassimally, 'Designing the Internet of Things', Wiley, 2014.
3. Kurose, James F Ross, Keith W, 'Computer networking: a top-down approach', 5th edition, international edition, Boston, Mass Pearson, cop. 2010.

References:

1. Olivier Hersent, David Boswarthick, Omar Elloumi, 'The Internet of Things: Key Applications and Protocols', Wiley, 2015.
2. Frank Vahid, Tony Givargis, 'Embedded System Design: A Unified Hardware/Software Introduction', Wiley, 2006.
3. 'Design Automation for Embedded Systems', Springer.
4. IEEE, IEEE Internet of Things Journal
5. Elsevier, Journal of Network and Computer Applications.
6. Elsevier, Computer Law & Security Review
7. ACM, ACM Transactions on Internet Technology (TOIT)

Sub Code:BTEE15F6404	**DBMS**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. Provide the basic knowledge about the data models and database concepts. 2. Describe conceptual data models and ER diagrams.					

	3. Explain theoretical concepts of the relational data model and the relational algebra. 4. Describe the use of SQL commands for database operations. 5. Illustrate database design concepts and normalization with examples
Course Outcomes	On completion of this course the students will be able to: 1. Apply the knowledge to design database schemas. 2. Design ER diagrams for given data models. 3. Use database concepts and relational models for building database applications. 4. Develop database applications for industrial projects. 5. Demonstrate skills as a database administrator to control both data and application programs

COURSE CONTENTS

Unit 1: Introduction to databases and Conceptual Modelling [12hrs]

Introduction, characteristics of the database approach, data models, schemas, instances, database languages and interfaces, Using high-level conceptual data models for database design, a sample database application, entity types, attributes, keys, relationship types, weak entity types, ER diagrams, naming conventions, design issues.

Unit 2: Relational Data Model and Relational algebra [12hrs]

Relational model concepts, relational model constraints and relational database schemas, update operations, transactions, dealing with constraint violations, unary relational operations, select and project, relational algebra operations from set theory, binary relational operations, join and division, additional relational operations, examples of queries in relational algebra.

Unit 3: SQL [12hrs]

SQL data definition and data types, specifying constraints in SQL, basic retrieval queries in SQL, insert, delete, update statements in SQL, additional features of SQL, schema change statements in SQL, Retrieving data using the SQL Select Statement, Restricting and sorting data, Using Single row functions, Joins, More complex SQL retrieval queries, views in SQL.

Unit 4: Database Design Theory and Normalization [12hrs]

Informal design guidelines for relation schemas, Functional dependencies, Normal forms based on primary keys, General definitions of second and third normal forms, Other Normal forms.

Text Books:

1. Raghu Ramakrishnan and Johannes Gehrke, 'Database Management Systems', 3rd Edition, McGraw-Hill, 2003.
2. Elmasri and Navathe, 'Fundamentals of Database Systems', 5th Edition, Pearson Education, 2007.

References:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, 'Database System Concepts', 6th Edition, McGraw Hill, 2010.
2. C J Date, 'Database Design and Relational Theory: Normal Forms and All that Jazz', O 'Reilly, April 2012.
3. IEEE, IEEE Transactions on Knowledge and Data Engineering
4. Elsevier, Elsevier Data and Knowledge Engineering
5. ACM, ACM Transactions on Database Systems

Sub Code: BTEE15F6501	**Power System Planning and Reliability**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To study the fundamentals of Generation system, transmission system and Distribution system reliability analysis 2. To illustrate the basic concepts of Expansion planning. 3. To introduce the objectives of Load forecasting					
Course Outcomes	On completion of this course the students will be able to: 1. Be able to describe the planning process of the power system. 2. Be able to identify the suitable techniques for load forecasting and modeling. 3. Be able to identify various measures has to taken while planning a power system. 4. Be able to analyze various optimization techniques					

COURSE CONTENTS

Unit 1: System planning & Load forecasting [14hrs]

Introduction, Objectives & Factors affecting to System Planning , National and regional planning Short Term Planning, Medium Term Planning, Long Term Planning, structure of power system, planning tools, electricity regulation. Objectives of forecasting - Load growth patterns and their importance in planning, Load Research, Load Growth Characteristics, Classification of Load and Its Characteristics, Load Forecasting Methods - (i) Extrapolation (ii) Co-Relation Techniques, Energy Forecasting, Peak Load Forecasting, Reactive Load

Forecasting, Non-Weather sensitive load Forecasting, Weather sensitive load Forecasting, Annual Forecasting, Monthly Forecasting, Total Forecasting.

Unit 2: Generation Planning and reliability [14hrs]

Objectives & Factors affecting Generation Planning, Generation Sources, Integrated Resource Planning, co-generation / captive power, power pooling and power trading, transmission & distribution planning, power system economics, power sector finance, financial planning, private participation, rural electrification investment, concept of rational tariffs. Generation System Model, Loss of Load (Calculation and Approaches), Outage Rate, Capacity Expansion, Scheduled Outage, Loss of Energy, Evaluation Methods, Interconnected System, and Factors Affecting Interconnection under Emergency Assistance.

Unit 3: Power Supply Reliability & Expansion Planning [14hrs]

Reliability planning, system operation planning, Evaluation Techniques (i) Markov Process (ii) Recursive Technique, Stochastic Prediction of Frequency and Duration of Long & Short Interruption, Adequacy of Reliability, Reliability Cost. Optimal Power system expansion planning, formulation of least cost optimization problem incorporating the capital, operating and maintenance cost of candidate plants of different types (thermal hydro nuclear Nonconventional etc), Optimization techniques for solution by programming.

Unit 4: Transmission & Distribution Planning [14hrs]

Introduction, Objectives of Transmission Planning, Network Reconfiguration, System and Load Point Indices, Data required for Composite System Reliability. Distribution system-Radial Networks, Network Reconfiguration, Evaluation Techniques, Interruption Indices, Effects of Lateral Distribution Protection, Effects of Disconnects, Effects of Protection Failure, Effects of Transferring Loads, Distribution Reliability Indices.

Text Books:

1. R.L. Sullivan, 'Power System Planning', Tata McGraw Hill Publishing Company Ltd, 2012
2. X. Wang & J.R. McDonald, 'Modern Power System Planning', McGraw Hill Book Company, 1994.

References:

1. T. Gonen, 'Electrical Power Distribution Engineering', McGraw Hill Book Company, 1986.
2. Roy Billinton & Ronald N. Allan, 'Reliability Evaluation of Power System', Springer Publication, 1986.
3. A.S.Pabla, 'Electrical Power System Planning', Macmillan India Ltd, 1998
4. B.R. Gupta, 'Generation of Electrical Energy' , S. Chand Publications

Sub Code: BTEE15F6502	**Modeling and Simulation of Electrical Machines**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To understand the concept of 2-axis representation of an Electrical machine. 2. To know the concepts of representing transfer function model of a DC machine. 3. To understand the importance of 3-phase to 2-phase conversion. 4. To know the representation of 3-phase induction motor in various reference frames 5. To know the modeling of 3-phase synch. Motor in 2- axis representation					
Course Outcomes	On completion of this course the students will be able to: 1. Develop models for linear and nonlinear magnetic circuits 2. Determine the developed torque in an electrical machines using the concepts of filed energy and co-energy and determine the dynamic model of a DC Machine 3. Determine the dynamic model of an induction machine based on the dq0 transformation and determine instantaneous torque developed in an induction machine-which leads to advanced control strategies such as vector control and direct torque control. 4. Determine the torque developed in a salient pole synchronous machine using the park's transformation and identifycontribution of saliency torque-damping torque and excitation torque					

COURSE CONTENTS

Unit 1: **[12hrs]**

Basic Two-pole DC machine - primitive 2-axis machine - Voltage and Current relationship - Torque equation. Mathematical model of separately excited DC motor and DC Series motor in state variable form - Transfer function of the motor - Numerical problems. Mathematical model

of D.C. shunt motor and D.C. Compound motor in state variable form - Transfer function of the motor - Numerical Problems.

Unit 2: **[10hrs]**

Linear transformation - Phase transformation (a, b, c to α, β, o) - Active Transformation (α, β, o to d, q). Circuit model of a 3 phase Induction motor – Linear transformation - Phase Transformation - Transformation to a Reference frame - Two axis models for Induction motor.

Unit 3: **[10hrs]**

Voltage and current Equations in stator reference frame - Equation in Rotor reference frame - Equations in a synchronously rotating frame - Torque equation-Equations in state-space form.

Unit 4: **[12hrs]**

Circuit model of a 3ph Synchronous motor - Two axis representation of Syn. Motor Voltage and current Equations in state - space variable form - Torque equation.

Text Books:

1. Vedam Subramanyam, 'Thyristor control of Electric Drives'.
2. Paul C.Krause , Oleg wasynezuk, Scott D.Sudhoff, 'Analysis of Electric Machinery and Drive Systems'

References:

1. Fitzgerald and Kingsley, 'Electric Machinery'
2. O'Simmons and Kelly, 'Introduction to Generalized Machine Theory'.
3. Hancock, 'Matrix Analysis of Electric Machinery'.

Sub Code: BTEE15F6503	**Operation research**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To understand the quantitative methods for effective decision making. 2. To study the various techniques for effective decision making to solve business decision problems. 3. To understand the model formulation and applications in business decision making.					
Course Outcomes	On completion of this course the students will be able to: 1. Knowledge and understanding - Be able to understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.					

	2. Cognitive skills (thinking and analysis) - Be able to build and solve Transportation Models and Assignment Models. 3. Communication skills (personal and academic) - Be able to design new simple models, like: CPM, PERT to improve decision –making and develop critical thinking and objective analysis of decision problems.

COURSE CONTENTS

Unit 1: Linear Programming **[12hrs]**

Introduction, Linear Programing, Formulation of linear programing problem, simplex method, computational procedure, Big-M method, two phase simplex method

Degeneracy, Alternative optional solutions, Duality in LPP, primal-dual relation, Formulation of dual problem, primal-dual optional solution, Dual simplex method

Unit 2: **Game Theory** **[8hrs]**

Introduction to optimal strategies, solution of 2 x 2, 2 x n, m x 2 games, Concept of dominance, Graphical method of solving, Sequencing problems, n-jobs and two machines, n-jobs and three machines, two jobs and m machines

Replacement theory, Introduction, Replacement considering both the cases with and without tie value of money

Unit 3: **Pert- CPM Techniques** [**10hrs]**

Network construction, Determining critical path & floats, Scheduling by network, project duration, Variance under probabilistic modes, prediction of date of completion, Crashing of simple networks

Unit 4:

Assignment Problems **[10hrs]**

Introduction & Assignment problems, Formulation, Hungarian method of solving assignment problems, travelling salesman problems

Transportation Problems

Basic feasible solution by different methods, fixing optimal solutions-stepping stone method, MODI method.

Text Books

1. Ackoff.R.L and Sasieni.M.W, 'Fundamentals of Operations Research', Wiley Eastern limited, New Delhi
2. Wayne.L Winston, 'Operations Research Applications and Algorithms', Cengage learning,4th edition,2009
3. Bronson.R, 'Operations Research', Schaum's Outline Series, McGrawHill international,2nd edition
4. S.D. Sharma , 'Introduction to Operations Research' , Gillet,B.E., TMH 1979

Sub Code: BTEE15F6504	**Web Programing**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To enable the students understand various steps in designing a creative and dynamic website. 2. To enable the students understand markup languages. 3. To enable students in designing dynamic and interactive web pages by embedding Java Script code in HTML. 4. To familiarize advantages and use of different types of CSS. 5. To familiarize server side scripting language like PHP					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the concepts of WWW including browser and HTTP protocol. 2. Summarize the various HTML tags and use them to develop the user friendly web pages. 3. Define the CSS with its types and use them to provide the styles to the web pages at various levels. 4. Develop the modern web pages using the HTML and CSS features with different layouts as per need of applications. 5. Apply JavaScript to develop the dynamic web pages. 6. Use server side scripting with PHP to generate the web pages dynamically using the database connectivity. 7. Formulate the modern Web applications using the client and server side technologies and the web design fundamentals					

COURSE CONTENTS

Unit 1: Introduction to Web programming **[10hrs]**

Web Essentials: Clients, Servers, and Communication. Internet Standards ,Introduction to WWW, WWW Architecture ,SMTP, Web Browsers and Web Servers, URLs, File Transfer Protocol - Overview of HTTP, HTTP request ,response ,Generation of dynamic web pages, Security.

Unit 2: UI Design [**11hrs]**

Markup Language (HTML): Introduction to HTML, Formatting and Fonts, Commenting Code, Anchors, Backgrounds, Images, Hyperlinks, Lists, Tables, Frames, HTML Forms.

Cascading Style Sheet (CSS): The need for CSS, Introduction to CSS, Basic syntax and structure, Inline Styles, Embedding Style Sheets, Linking External Style Sheets, Backgrounds, Manipulating text, Margins and Padding, Positioning using CSS.

Unit 3: JAVA Script [**11hrs]**

Introduction: Overview of Java Script, Object orientation and Java Script, Data types and Variables - Operators, Expressions, and Statements - Functions - Objects - Array, Document Object Model - Event Handling - Controlling Windows & Frames and Documents - Form handling and validations, Errors in scripts, Examples.

Unit 4: PHP **[10hrs]**

Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP. PHP and MySQL: Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs

Text Books:

1. Deitel, Goldberg, 'Internet & World Wide Web How to Program', Third Edition, PearsonEducation,2006.
2. Marty Hall and Larry Brown, 'Core Web Programming', Second Edition, Volume I and II, PearsonEducation,2001.
3. Bates, 'Developing Web Applications', Wiley, 2006.
4. David Flanagan, 'JavaScript: The Definitive Guide, Sixth Edition', O'Reilly Media, 2011
5. Steven Holzner, 'The Complete Reference – PHP', Tata McGraw Hill, 2008
6. Mike Mcgrath, 'PHP & MySQL in easy Steps', Tata McGraw Hill, 2012.
7. ELSEVIER Journals within "Internet And Web Technology"

Sub Code:BTEE15F6601	Smart Grid	C	L	T	P	CH
Duration: 14 Weeks		4	3	2	0	5
Course Objectives	1. To understand the concept of Smart Grid, compare with conventional grid, and identify its opportunities and barriers. 2. To understand the concept of Smart Meter, Smart Appliances, Automatic Meter Reading, Outage Management System, Plug in Hybrid Electric Vehicles, Vehicle to Grid, Smart Sensors, Home & Building Automation, Phase Shifting Transformers. 3. To understand the concept of Substation Automation, Feeder Automation. Intelligent Electronic Devices, Smart storage like Battery, Pumped Hydro, Compressed Air Energy Storage, Wide Area Measurement System, Phase Measurement Unit. 4. To understand the concept of microgrid and its integration with main central grid.					
Course Outcomes	On completion of this course the students will be able to: 1. Differentiate Conventional and Smart Grid. 2. Adopt smart meters in industries and residential sector 3. Identify the need of Smart Grid, Micro Grid, Smart metering, Smart storage, Hybrid Vehicles, Home Automation, Smart Communication. 4. Use smart technologies that will enhance the reliability and energy efficiency of distribution system. 5. Comparing and getting acquainted with emerging technologies and current professional issues in electric Grid 6. Implement the use of renewable energy systems in the distribution system.					

COURSE CONTENTS

UNIT – I Introduction to Smart Grid [14hr]

Concept of Smart Grid, Definitions, Functions of Smart Grid, Opportunities & Barriers of Smart Grid, Difference between conventional & smart grid, Smart Grid Vision & Roadmap for India, Present development & International policies in Smart Grid, Smart Cities, Pilot projects in India. Smart Grid Technologies: Remote Terminal Unit (RTU), Intelligent Electronic Devices (IED), Phase Measurement Unit (PMU). Smart Substations, application for monitoring, protection and control, Plug in Hybrid Electric Vehicles (PHEV), Vehicle to Grid (V2G), Grid to vehicles (G2V),

UNIT – II Smart Meters and Advance Metering Infrastructure [14 hr]

Introduction to Smart Meters, Advanced Metering Infrastructure (AMI), Real Time Prizing, Automatic Meter Reading (AMR), Outage Management System (OMS) Smart Sensors, Smart Appliances, Home & Building Automation, Geographic Information System (GIS).
Smart storage technologies: Battery (flow and advanced), SMES, Super Capacitors, Pumped Hydro, Compressed Air Energy Storage (CAES) and its comparison.

UNIT – III Microgrids [14 hr]

Concept of Microgrid, need & applications of Microgrid, Microgrid Architecture, DC Microgrid, Formation of Microgrid, Issues of interconnection, protection & control of Microgrid, Integration of renewable energy sources, Smart Microgrid, Microgrid and Smart Grid Comparison, Smart Microgrid Renewable Green Energy System, modeling of PV and wind systems, islanding

UNIT – IV Communication Technology for Smart Grid [14 hr]

Communication Architecture of SG, Wide Area Measurement System (WAMS), Home Area Network (HAN), Neighbourhood Area Network (NAN), Wide Area Network (WAN). Bluetooth, ZigBee, GPS, Wi-Fi, Wi-Max based communication, Wireless Mesh Network, Basics of CLOUD Computing & Cyber Security for Smart Grid, Broadband over Power line (BPL), IP based protocols.

TEXT BOOKS:

1. Ali Keyhani, Mohammad N. Marwali, Min Dai "Integration of Green and Renewable Energy in Electric Power Systems", Wiley
2. Clark W. Gellings, "The Smart Grid: Enabling Energy Efficiency and Demand Response", CRC Press.
3. Janaka Ekanayake, Nick Jenkins, Kithsiri Liyanage, Jianzhong Wu, Akihiko Yokoyama, "Smart Grid: Technology and Applications", Wiley Publications.
4. Stuart Borlase, "Smart Grids-Infrastructure, Technology and Solutions", CRC Press, Taylor and Francis group
5. Janaka Ekanayake, Kithsiri Liyanage, Jianzhong Wu and Akihiko Yokoyama, "Smart Grid Technology and applications", Wiley Publications.
6. James Momoh, "Smart Grid-Fundamentals of design and analysis", Wiley Publications.

Reference books:

1. Nikos Ziargyriour, "Micro grid, Architecture and Control", IEEE Press, Wiley Publications.

2. Yang Xiao, "Communication and Networking in Smart Grids", CRC Press, Taylor and Francis group.
3. Lars T. Berger and Krzysztof Iniewski, "Smart Grid-Applications, Communications and Security", Wiley Publications.
4. Mladen Kezunovic, Mark G. Adamiak, Alexander P. Apostolov, Jeffrey George Gilbert "Substation Automation (Power Electronics and Power Systems)", Springer Publications.
5. Stephen F.Bush, "Smart Grid-Communication Enabled Intelligence for the Electric Power Grid", IEEE Press, Wiley Publications
6. R. C. Dugan, Mark F. McGranghan, Surya Santoso, H. Wayne Beaty, "Electrical Power System Quality", 2nd Edition, McGraw Hill Publication.
7. Jean Claude Sabonnadière, Nouredine Hadjsaïd, "Smart Grids", Wiley Blackwell

Sub Code: BTEE15F6602	**Digital Signal Processing**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. Apply digital signal processing fundamentals. 2. What are the key DSP concepts and how do they relate to real applications? 3. Master the representation of discrete-time signals in the frequency domain, using z-transform, discrete Fourier transform (DFT), and cosine transform. 4. Understand the implementation of the DFT in terms of the FFT, as well as some of its applications 5. Learn the basic forms of FIR and IIR filters, and how to design filters with desired frequency responses. 6. Appreciate relationships between first order low pass, and high pass filters, and between second-order Peaking and Notching filters. Design digital filters using Matlab					
Course Outcomes	On completion of this course the students will be able to: 1. Represent discrete-time signals analytically and visualize them in the time domain. 2. Understand the meaning and implications of the properties of systems and signals. 3. Understand the Transform domain and its significance and problems related to computational complexity. 4. Be able to specify and design any digital filters using MATLAB					

COURSE CONTENTS

Unit 1: Discrete Fourier Transforms [14hrs]

Definitions, properties-linearity, shift, symmetry etc, circular convolution –periodic convolution, use of tabular arrays, circular arrays, stock hams's method, linear convolution –two finite duration sequence, one finite & one infinite duration, overlap add and save methods..

Unit 2: Fast Fourier Transforms Algorithms [14hrs]

Introduction, decimation in time algorithm, first decomposition, number of computations, continuation of decomposition, number of multiplications, computational efficiency, decimation in frequency algorithms, algorithm, inverse decimation in time and inverse decimation in frequency algorithms, decomposition for a composite number N=9.

Unit 3: Design of IIR&FIR Digital Filters [14hrs]

Introduction, impulse invariant & bilinear transformations, all pole analog filters- Butterworth & chebyshev, design of digital Butterworth & Chebyshev, frequency transformations FIR: Introduction, windowing, rectangular, modified rectangular, Hamming, Hanning, blackman window(excluding Kaiser window), frequency sampling techniques.

Unit 4: Digital Filter Structures [14hrs]

Realization of digital filters, Basic building blocks of digital filter, structures for IIR system, direct form, cascade form and parallel form structures, structures for FIR system, direct form, cascade form and lattice structures.

Text Books:

1. Proakis, 'Digital Signal Processing Principle, Algorithm & application', Pearson, 4th edition, 2009.
2. Sanjeet. K. Mitra, 'Digital Signal Processing', TMH, 3rd Edition, 2009.

Reference Books:

1. Johnny R. Johnson, 'Introduction to Digital Signal Processing', PHI, 2009.
2. Openheim, 'Discrete Time Signal Processing', Pearson 2nd edition, 2009.
3. S. Salivahanan, A. Vallaraj, C.Gnanapriya, 'Digital Signal Processing', TMH, 2nd Edition, 2010.
4. Ifeachor Emmauel, 'Digital Signal Processing', Pearson education, 2nd Edition, 2006.
5. Ludeman,John Wiley, 'Fundamentals of Digital Signal Processing', 3rd Edition, 2008

Sub Code: BTEE15F6603	VLSI Circuits and Design	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	1. To give clear idea about the basics of VLSI design and its importance. 2. To know about the operating principles of MOS transistor. 3. To understand the basics of MOS process Technology. 4. To study about construction of NMOS, CMOS and Bi-CMOS based logic gates. 5. To understand the necessity of testing and the design strategy of the same					
Course Outcomes	On completion of this course the students will be able to: 1. Understand the characteristics of CMOS circuit construction. 2. To demonstrate the fundamentals of IC technology such as various MOS fabrications. 3. To calculate electrical properties of MOS circuits such as Ids - Vds relationships. 4. To design various gates, adders, Memories, using stick diagrams					

COURSE CONTENTS

Unit 1: Introduction **[11hrs]**

Introduction to Integrated Circuit Technology – MOS, PMOS, NMOS, CMOS & BiCMOS technologies; Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Integrated Resistors and Capacitors.

Basic Electrical Properties

Drain to source current Ids versus Vds relationships-BICMOS latch up susceptibility. MOS transistor characteristics, figure of merit, pass transistor NMOS and COMS inverters,Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

Unit 2: VLSI Circuit Design Processes [**10hrs]**

VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates,

Scaling of MOS circuits .

Gate Level Design

Logic Gates, Switch logic, Alternate gate circuits, Time delays, Driving large capacitive loads, Wiring capacitance, Fan – in, Fan – out, Choice of layers.

Unit 3: Data Path Subsystems [15hrs]

Subsystem Design, Shifters, Adders, ALUs, Parity generators, Comparators, Zero/One Detectors, Counters.

Array Subsystems:

SRAM, DRAM, ROM, Serial Access Memories, Content Addressable Memory.

Unit 4: COMS Testing [6hrs]

CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

Text Books:

1. Douglas Pucknell & Eshragian, 'Basic VLSI Design', PHI, 3rd Edition.
2. John .P. Uyemura, 'CMOS Logic Circuit Design', Springer.
3. Neil Weste, 'Introduction to CMOS VLSI Design- A Circuits and Systems Perspective', Pearson Education, 3rd Edition

Sub Code: BTEE15F6604	**Data Structures using C++**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. Introduce the basic concepts for defining classes with data and member functions. 2. Explain the knowledge of structure, operations and applications of various data structures like arrays, structures, unions, lists, stacks, queues, trees, graphs, hash tables and heaps. 3. Provide the students with solid foundations in the basic concepts of programming: data structures and algorithms. 4. Familiarize the concept of Abstract Data Types (ADT) 5. and Implement ADT in several programming languages					

Course Outcomes	On completion of this course the students will be able to: 6. Implement classes and objects for a given problem. 7. Demonstrate the ability of accessing members in the written programs. 8. Impart the effectiveness of data structures and algorithms for solving a given problem. 9. Package a set of data structures and algorithms as an 10. abstract data type.

COURSE CONTENTS

Unit 1: **[10hrs]**

Introduction: Overview of C++, Introduction to variables in C++, I/O operators, Function overloading, Inline function, Recursive function.

Classes & Objects: Introduction to Classes, Member Functions and Member data, Constructors and Destructors, The scope resolution operator, Static Class members.

Introduction to Objects, Array of Objects, Dynamic Objects, Pointers to objects, Friend Function

Unit 2: **[11hrs]**

Introduction to Data structures and Algorithms: Data, Data Types, Abstract Data Types and Examples, Algorithms, Arrays: One Dimensional and Two Dimensional, Structures: Introduction to structures and nested structures.

Unit 3: Data Structure-I **[11hrs]**

Pointers: Introduction, Recursion, Stacks, Queues: Simple, circular and priority Queues, Linked Lists: Singly and Doubly Linked List.

Unit 4: Data Structure-II **[10hrs]**

Trees: Terminologies and types, Binary Trees, Binary Search Trees, Tournament Trees, Heaps, Hash Tables, Graphs and Algorithms: Basic Terminologies and BFS DFS Algorithm

Text Books:

1. HerbertSchildt, 'The Complete Reference C++', 4th Edition, Tata McGraw Hill, 2003.
2. SanleyB.Lippmann, JoseeLajore, 'C++ Primer', 4th Edition, Pearson Education, 2005.
3. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, 'Introduction to

Algorithms', IT Press, 2002
4. Horowitz, Sahni, Anderson-Freed, 'Fundamentals of Data Structures in C', 2nd Edition, Universities Press, 2007

Reference Books:

1. Paul J Deitel, Harvey M Deitel, 'C++ for Programmers', Pearson Education, 2009.
2. K R Venugopal, RajkumarBuyya, T Ravi Shankar, 'Mastering C++', Tata McGraw Hill, 1999.
3. ACM, ACM Transactions on Programming Languages and Systems (TOPLAS)
4. Joshi, 'Data Structures and Algorithms in C', Tata McGraw-Hill Education, 2010
5. Richard Gilberg, Behrouz Forouzan,Data Structures, 'A Pseudo code Approach with C', Cengage Learning, 2004

Sub Code: BTEE15F6700	**Electrical Machines Laboratory- II**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Weeks		**2**	**1**	**0**	**1**	**3**
Course Objectives:	1. The ability to conduct testing and experimental procedures on different types of electrical machines. 2. To give an insight into usage of software packages like MATLAB for the realization of circuits without actually exciting them. 3. To enable the student to understand the working of circuits. 4. To practice different types of wiring and devices connections. 5. TO create capability to analyze the operation of electric machines under different loading conditions					
Course outcomes	At the end of this course, Student will be able to: 1. Be able to feel the hands on experience. 2. Understand the concept of efficiency and the short circuit impedance of a three-phase transformer from no-load test, winding resistance, short circuit test, and load test. 3. Understand the starting and connecting procedures of synchronous generators, and to obtain the 'V' curves of synchronous motors. 4. Experimentally obtain the load characteristics, starting current and starting torque for series and shunt motors					

List of Experiments:

1. Determination of regulation of alternator by Synchronous Impedance method; Determination of regulation of alternator by zero power factor method; 'V' and 'Λ' curves of Synchronous

Motor; Measurement of Xd & Xq of synchronous machine;

2. Parallel Operation of 3 Phase Alternator with infinite Bus Bar
3. Determination of efficiency of DC machine through Hopkinson s Test.
4. Speed control of DC motor by Ward-Leonard method
5. magnetization characteristic of separately excited DC generator and self-excited dc machines
6. Retardation Test on DC motor
7. V and inverted v curves of synchronous motor
8. MATLAB SIMULATION of dc motor characteristics and speed control
9. Slip test on synchronous generator
10. Swinburne's test on dc motor

Sub Code: BTEE15F6800	**Control System Laboratory**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Weeks		**2**	**1**	**0**	**1**	**3**
Course Objectives:	1. To enable students to understand the usage of discrete components and operation of measuring and testing equipment. 2. To give an insight into usage of software packages like MATLAB/SCILAB for the realization of physical modules without actually exciting them. 3. To enable the student to understand the importance of transfer function in control system					
Course outcomes:	At the end of this course, Student will be able to: 1. Be able to understand the usage of measuring and testing equipment for different applications. 2. Be able to feel the hands on experience. 3. Be able to learn to formulate mathematical models for other physical quantities					

List of Experiments:

1. Using MATLAB/SCILAB

a) Simulate a typical second order system and determine its step response and evaluate the time- domain specifications.

b) Evaluate the effect of additional poles and zeroes on time response of second order system.

c) Evaluate the effect of pole location on stability

d) Evaluate the effect of loop gain of a negative feedback system on stability

2. a) Design a passive RC lead compensating network for the given specifications, viz., the maximum phase lead and the frequency at which it occurs and to obtain its frequency response.

   b) Determine experimentally the transfer function of the lead compensating network and verify the same with simulation.

3. a) Design RC lag compensating network for the given specifications., viz., the maximum phase lag and the frequency at which it occurs, and to obtain its frequency response.

   b) Determine experimentally the transfer function of the lag compensating network and verify the same with simulation.

4. a) Design RC lag-lead compensating network for the given specifications., viz., the maximum phase lag and the frequency at which it occurs, and to obtain its frequency response.

   b) Determine experimentally the transfer function of the lag compensating network and verify the same with simulation.

5. Study the effect of P, PI, PD and PID controller on the step response of a feedback control system (using control engineering trainer/process control simulator). Verify the same by simulation.
6. a) Conduct an experiment to draw the speed – torque characteristic of a two - phase A.C. servomotor.

   b) Conduct an experiment to draw speed torque characteristic of a D.C. servomotor.

7. Determine experimentally the frequency response of a second -order system and evaluation of frequency domain specifications.
8. Using MATLAB/SCILAB

   a) Simulate a D. C. position control system and obtain its step response

   b) Verify the effect of the input wave form, loop gain system type on steady state errors.

   c) Perform a trade-off study for lead compensation

   d) Design a PI controller and study its effect on steady state error

9. Using MATLAB/SCILAB

   a) Examine the relationships between open-loop frequency response and stability, open loop frequency and closed loop transient response

b) Study the effect of addition closed loop poles and zeroes on the closed loop transient response

10. Using MATLAB/SCILAB

a) Examine the effect of open loop zeroes on root locus contour

b) Estimate the effect of open loop gain on the transient response of closed loop system by using Root locus

c) Carryout a comparative study of Bode, Nyquist and Root locus with respect to Stability.

11. Conduct an experiment to draw to synchro-pair characteristics

VI Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F7100	Computer Aided Power System Analysis and Stability	HC	4	3	1	0	5
2	BTEE15F7200	CAED	HC	4	3	1	0	5
2	BTEE15F7300	Project Phase I	HC	2	0	1	1	4
4	BTEE15F7401	Power System Protection	SC	4	3	1	0	5
	BTEE15F7402	HVDC						
	BTEE15F7403	Industrial Instrumentation and Automation						
	BTEE15F7404	Operating system						
5	BTEE15F7501	Testing and Commissioning of Electrical Equipment	SC	4	3	1	0	5
	BTEE15F7502	Electricity Regulations						
	BTEE15F7503	Non Conventional Energy Sources						
	BTEE15F7504	Fuzzy logic system						
6	-	Open Elective subject offered by other school	OE	4	3	1	0	5
7	BTEE15F7700	Relay and High Voltage Laboratory	HC	2	1	0	1	3
8	BTEE15F7800	Power System Simulation Laboratory	HC	2	1	0	1	3
TOTAL CREDITS				**26**	**17**	**6**	**3**	**35**

Sub Code: BTEE15F7100	**Computer Aided Power System Analysis and Stability**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To enable students to understand the basics of network topology and its relevance in 2. Power System Analysis 3. To enable students to understand the analysis of power system network topologies 4. To enable students to learn the concept of power flow and its analysis by different 5. methods 6. To enable students to understand different methods of stability analysis by different techniques					
Course Outcomes	On completion of this course the students will be able to: 1. able to identify the incidence of elements of given power system network 2. able to solve different examples related to network topology 3. able to identify state of the power system through different load					

	flow techniques 4. able to demonstrate stability of power system through different methods

COURSE CONTENTS

Unit 1: Network Topology [11hrs]

Introduction, Elementary graph theory – oriented graph, tree, co-tree, basic cut-sets, basic loops; Incidence matrices – Element-node, Bus incidence, Tree-branch path, Basic cut-set, augmented cut-set, Basic loop and Augmented loop, Primitive network – impedance form and admittance form.

Unit 2: Load Flow Studies [17hrs]

Introduction, Power flow equations, Classification of buses, Operating constraints, Data for load flow, Gauss-Seidal Method – Algorithm and flow chart for PQ and PV buses (numerical problem for one iteration only), Acceleration of convergence; Newton Raphson's Method –Algorithm and flow chart for NR method in polar coordinates (numerical problem for one iteration only). Algorithm for Fast Decoupled load flow method, Comparison of Load Flow Methods.

Unit 3: Stability Analysis [12hrs]

Importance of stability analysis in power system planning and operation – classification of power system stability – angle and voltage stability – simple treatment of angle stability into small- signal and large-signal (transient) stability. Single Machine Infinite Bus (SMIB) system: Development of swing equation – equal area criterion –determination of critical clearing angle and time by using modified Euler method and Runge-Kutta second order method. Algorithm and flow chart.

Unit 4: Transient Stability Studies [16hrs]

Numerical solution of Swing Equation – Point-by-point method, Modified Euler's method,Runge-Kutta method, Milne's predictor corrector method. Representation of power system for transient stability studies – load representation, network performance equations. Solution techniques with flow charts.

Text Books

1. Stag G. W and EI-Abiad, A. H, 'Computer Methods in Power System Analysis', McGraw Hill International Student Edition, 1968.

2. Pai, M. A, 'Computer Techniques in Power System Analysis', TMH, 2nd edition, 2005.
3. Nagrath, I. J., and Kothari, D. P, 'Modern Power System Analysis', TMH, 3rd Edition, 2003.
4. Singh, L. P, 'Advanced Power System Analysis and Dynamics', New Age International (P) Ltd, New Delhi, 2001.
5. Dhar, R. N, 'Computer Aided Power System Operations and Analysis', TMH, 1984.
6. Haadi Sadat, 'Power System Analysis, TMH, 2nd Edition, 12th reprint, 2007

Sub Code: BTEE15F7200	**CAED**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**0**	**1**	**5**
Course Objectives	1. To understand the basics of concept of engineering drawing through AUTO CAD software. 2. To provide an overview of various sectional views of electrical machines. 3. To understand the basic sense of measurement. 4. To provide an insight into various dimensions of equipment used in transmission and distribution.					
Course Outcomes	On completion of this course the students will be able to: 1. Work with Auto CAD 2D classic and execute the basic commands of auto cad software 2. Draw the isometric and orthographic views of given objects 3. Draw the sectional views of Electrical Machines 4. Differentiate between single and three phase systems 5. Implement the knowledge of CAD and EE drawing in design of real time application					

COURSE CONTENTS

Unit 1 : Introduction to Computer Aided Drawing [14hrs]

Launching AutoCAD, Choosing Auto CAD classic workspace**,** Understanding basic toolbars, Drawing setting commands , Basic commands, Coordinate systems in Auto CAD, different types of lines, Dimensioning systems ,Methods of dimensioning diameters, radius, angular, Aligned dimensioning , Linear dimensioning, Radial dimensioning, Dimension style.(The dimensioning can be done with each one example), Isometric projections, isometric projections of rectangular objects like cube , prism, pyramids, cone, cylinder and sphere. Isometric projection of step block V block, cross. Orthographic projections , projection ofpoint in all quadrants ,projection of straight lines, projections of triangular, square, pentagonal, hexagonal and circular in current positions. Description of sectional views i.e. plan view , elevation view , end view with 1 e.g.\

Unit 2: Electrical Machines [14hrs]

Electrical machine assembly drawing using designs data or sketches or both.

(a) Transformers Assembly - sectional views of single and three phase Core and Shell type Transformers.

(b) Alternator Assembly – sectional views of stator and rotor separately. (Demo)

(c) D.C. Machine Assembly- sectional views of yoke, armature and commutator dealt separately.

(d) Induction Motor Assembly - sectional views of stator and rotor separately.

Unit 3: Winding diagrams [14hrs]

Developed winding diagrams of D.C. machines – Simplex and multiplex double layer Lap and Wave windings.

Developed winding diagrams of A.C. machines Integral and Fractional slot double layer Lap and Wave windings. Single line diagrams of various Substations,(Transformer substations only)

Unit 4: Diagrams of Transmission & Distribution Equipment's [14hrs]

Draw: Single line diagrams of various Substations,(Transformer substations only) ,

Transmission Towers-110/220 KV single circuit and double circuit with dimensions, 220KV 'Y' Type single circuit Steel tower, Pin insulator 11KV, 33 KV Underground Cable for 11KV single core and three core Electrical Wiring plan of a residential building to be wired up with AEH installation (Load calculation, Heating and Lighting Circuit) , Electrical wiring plan of anElectric laboratory using standard symbols , Plate &Pipe Earthing.

Text Books :

1. M Yogesh, BS Nagaraja, N Nandan, 'Computer Aided Electrical Drawing', First edition PHI 2014
2. SF Devalapur, 'Electrical Drafting', EBP, Seventh edition, 2006

Reference Books :

1. MS Indira ,V D Shankarlal , D Buela, 'CAD for Electric Engineers', First Edition, Elsevier learning, 2014
2. K R Goplalkrishna, 'Engineering Drawing', 2nd Edition
3. S K Bhattacharaya, 'Electrical Engineering Drawing', New age international publishers (Revised Second edition), 2010

4. https://sites.google.com/site/caedbymaheshkumar/

Sub Code: BTEE15F7300	Project Phase - I	C	L	T	P	CH
Duration: 14 Weeks		2	0	1	1	4
Course Objectives	1. To Articulate a clear research question or problem and formulate a hypothesis 2. To identify and demonstrate appropriate research methodologies and know when to use them 3. To define, articulate and use terminology, concepts, and theory in their field and know how to use them 4. To use library and other tools to search for existing body of research relevant to their topic 5. To know existing body of research relevant to their topic and explain how their project fits 6. To identify and practice research ethics and responsible to conduct in research					
Course Outcomes	On completion of this course the students will be able to: 1. Define research problem and formulate the hypothesis 2. Demonstrate research methodologies 3. Define terminology and understand the concepts related to the same 4. Do rigorous literature survey based on the problem defined 5. Compare the existing body of research and their proposed work 6. Practice research ethics 7. To document the problem definition, objectives and research methodology chosen to proceed in the form of Synopsis					

GUIDELINES

Guidelines for the preparation of the Report: As per the University Guidelines

Guidelines for the Evaluation:

1. Student has to submit a synopsis and give the preliminary presentation during C1 which carries 20% of the total marks
2. Students has to submit a report which is the documentation of the literature survey carried

out and need to give a presentation of the project work , during C2, which carries 20% of the total marks

3. Students has to submit Project phase 1 report and need to give a presentation of the project work, during C3, which carries 60% of the total marks
4. All the above reports must undergo a plagiarism check which should not exceed 25% and failing which lead to resubmission

Sub Code: BTEE15F7401	**Power System Protection**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To understand the methods of representation of systems and to desire their transfer function models reduction of blockdiagrams. 2. To provide adequate knowledge in the time response of systems and steady state error analysis, different types of controller. 3. To accord basic knowledge in obtaining the open loop and closed–loop frequency responses of systems & to understand the concept of stability of control system and methods of stability analysis. 4. To study the three ways of designing compensation for a control system and state space analysis					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the operation of switch gear and protection system. 2. Classify various types of Circuit Breakers and Relays 3. Explain the theory, construction, advantages and disadvantages of different types of Circuit Breakers and Relays. 4. Describe protection schemes for transformers, alternators and induction motors 5. List the applications of circuit breakers and relays in real life					

COURSE CONTENTS

Unit 1: **[10hrs]**

Fuse: Introduction to fuse, fuse law, cut -off characteristics, Time current characteristics, HRC fuse, liquid fuse, Application of fuse

Switch Gear: Circuit breaker: Basic Principle of operation , DC and AC Circuit breaking phenomena of arc, properties of arc, initiation , maintenance and Interruption of arc.

Unit 2: **[10hrs]**

Circuit Breakers: Air Circuit breakers – Air break and Air blast Circuit breakers. SF6 breaker - Preparation of SF6 gas, Puffer and non Puffer type of SF6 breakers.Vacuum circuit breakers - principle of operation and constructional details. Advantages and disadvantages of different types of Circuit breakers.

Unit 3: [**10hrs]**

Protective Relays: Basic definitions associated with protective Relaying. Principle of operation of Electromagnetic Relays and Classification. over current relays - Non-directional and directional over current relays, IDMT and Directional characteristics. Differential relays – Principle of operation, percentage differential relay and its characteristics. Distance relays- Impedance relay, Reactance relay, Mho relay. Buchholz relay, Negative Sequence relay.

Unit 4: **[10hrs]**

Protection Schemes: Generator Protection - prime mover faults, stator and rotor faults, Merz price protection, protection against abnormal conditions - unbalanced loading, loss of excitation, over speeding. Transformer Protection - Differential protection, differential relay with harmonic restraint. Induction motor protection - Protection against phase fault, ground fault , single phasing, phase reversal and over loading.

Text Books:

1. Y.G. Paithankar and S.R. Bhide, 'Fundamentals of Power System Protection', Prentice Hall of India Pvt. Ltd., New Delhi–110001, 2003
2. Badri Ram, Vishwakarma, 'Power System Protection and Switchgear', Tata McGrawHill, 2001.

Reference Books:

1. Sunil S. Rao, 'Switchgear and Protection', Khanna publishers, New Delhi, 1986.

2. B. Ravindranath, and N. Chander, 'Power System Protection & Switchgear', WileyEastern Ltd., 1977.

Sub Code: BTEE15F7402	**HVDC**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To understand the necessity of HVDC Transmission, how it differs from AC transmission, advantages and disadvantages, planning issues, applications and latest developments. 2. To understand the concepts of HVDC converter, control of HVDC system, how faults occur and protection against thesame. 3. To understand the function of smoothing reactor, dc line, power flow analysis and MTDC systems. 4. To understand how to simulate HVDC system related circuits in MATLAB and SIMULINK					
Course Outcomes	On completion of this course the students will be able to: 1. Understand what HVDC system is, how it differs from AC, why it is required, and what are the advantages and disadvantages. 2. Understand how the control of HVDC system is achieved, the faults in the HVDC system and how protection is done against the same. 3. Understand the function of smoothing reactor, various concepts of DC line, power flow analysis and MTDC systems. 4. Simulate in MATLAB and Simulink, the HVDC power transmission related circuits					

COURSE CONTENTS

Unit 1:
General Aspects of Dc Transmission and Comparison of it with AC Transmission [10hrs]

Historical sketch, constitution of EHV AC and DC links, Limitations and Advantages of AC and DC Transmission.

Unit 2: Converter Circuits [10hrs]
Valve Characteristics, Properties of converter circuits, assumptions, single phase, three phase converters, choice of best circuits for HV DC circuits.

Unit 3: Analysis of the Bridge Converter [10hrs]

Analysis with grid control but no overlap, Analysis with grid control and with overlap less than 60 degree, Analysis with overlap greater than 60 degree, complete characteristics of rectifier, Inversion.

Unit 4: Control of HVDC Converters and Systems [10hrs]

Grid control, basic means of control, power reversal, limitations of manual control, constant current versus constant voltage, desired feature of control,actual control characteristics, constant -minimum -Ignition –angle control, constant –current control,constant –extinction –angle control, stability of control.

NOTE: Assignments to be given on MATLAB simulation (any Two)

1. **Simulation**: Thyristor based HVDC link and VSC based HVDC link simulation using MATLAB and Simulink.

2. **Simulation:** HVDC fault analysis simulation using MATLAB and Simulink

3. **Simulation**: SVC and STATCOM simulation using MATLAB and Simulink.

4. **Simulation**: MATLAB and Simulink simulation of a simple HVDC system transmission system with a 6 pulse converter to study the steady state and transient response.

Text Books:

1. EW Kimbark, "Direct current transmission",
2. Prabha Kundur, 'Power System Stability and Control', TMH, 9th reprint,2007
3. Jos Arrillaga,Y.H.Liu and Mevelle R Watson, 'High Voltage Power Transmission: The HVDC Options', Wiley Interscience.
4. K.R.Padiyar,'High voltage DC Power Transmission system', New Age International Publishers Ltd

Sub Code: BTEE15F7403	Industrial Instrumentation and Automation	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	1. Learn about the types of transducers for industrial applications. 2. Bring out the various measurements involved in Power Plants. 3. Familiarize the student with the methods of monitoring different parameters like speed, vibration of turbines & their control 4. Know about the tools like PLC, DCS, and SCADA					
Course Outcomes	On completion of this course the students will be able to: 1. Select instruments and transducers for various physical variables. 2. Get an insight on data acquisition, processing and monitoring system. 3. Design various signal conditioning systems for transducers. 4. Understand the programming realization of PLC					

COURSE CONTENTS

Unit 1: Introduction to Process Control **[11hrs]**

Block diagram of process control loop, definition of elements. Sensor time response - first and second order responses. Review of Transducers: Characteristics and Choice of transducer- factors influencing choice of transducer.

Applications of Transducers - Displace measurement: Resistance potentiometer, Capacitive and Inductive. Capacitive differential pressure measurement- Torsional, shearing stress and rotating shaft Torque measurement using strain gauge. Flow measurement: Hotwire anemometer, constant resistance Constant current type Eddy current sensors, Variable reluctance tachometers Phase measurement. Analog and digital phase detectors.

Unit 2: Signal conditioning circuits **[10hrs]**

Instrumentation amplifiers, Unbalanced bridge. Bridge linearization using op amp Precision rectifiers, Log amplifiers, Charge amplifiers, Isolation amplifier, Switched capacitor circuits, Phase sensitive detectors, Noise problem in instrumentation and its minimisation.

Measurements in Power Plants

Electrical measurements – current, voltage, power, frequency, power factor. Non electrical parameters- flow of feed water, fuel, air and steam with correction factor for temperature- steam pressure & steam temperature –drum level measurement-radiation detector – smoke density measurement – dust monitor.

Unit 3: Monitoring & Control in Power Plants **[11hrs]**

Speed, Vibration, Shell temperature monitoring and control – steam pressure Control – lubricant oil temperature control –Pollution monitoring- cooling system.

Overview of Automation System

Architecture of Industrial Automation Systems, Different devices used in Automation Actuators, definition, types, selection. Pneumatic, Hydraulic, Electrical, Electro-Pneumatic and valves, shape memory alloys.

Unit 4: Introduction to Sequence Control [10hrs]

PLCs - Working, Specifications of PLC Onboard/Inline/Remote IO's, Comparison of PLC & PC, Relay Ladder Logic- PLC Programming- realization of AND, OR logic, concept of latching, Introduction to Timer/Counters, Exercises based on Timers, Counters. Basic concepts of SCADA, DCS and CNC.

Text Books:

1. Curtis D. Johnson, 'Process Control Instrumentation Technology', 7th Edition, Pearson Edition, Pearson Education, New Delhi, 2002 / PHI.
2. DVS. Murty, 'Transducers and Instrumentation' Second Edition, PHI Learning Pvt Ltd New Delhi ,2013
3. K Krishnaswamy, M. Ponni Bala, 'Power Plant Instrumentation', Second Edition, PHI Learning Pvt Ltd, New Delhi, 2013
4. Madhuchhanda Mitra, Samarjit Sengupta, 'Programmable Logic Controllers and Industrial Automation An Introduction', Penram International Publishing (India) Pvt Ltd., 2009

References:

1. Doeblin E.O, 'Measurement Systems: Application and Design, Fourth Edition, McGraw Hill, Newyork, 1992
2. G.K.McMillan, 'Process/Industrial Instrument and control and hand book' McGraw Hill, New York,1999
3. R K Jain, Mechanical & Industrial Measurements, Khanna Publishers, New Delhi, 1995.

Sub Code: BTEE15F7404	Operating Systems	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	1. Introduce the history, basics and structure of Operating System 2. Describe process concepts and scheduling techniques 3. Familiarize with physical and virtual memory management techniques 4. Describe UNIX kernel, data structures and internal representation of files in UNIX operating system 5. Illustrate Inter process communication mechanisms					
Course Outcomes	On completion of this course the students will be able to: 1. Explain the history, basics and structure of operating systems 2. Implement various process management and scheduling schemes 3. Design and develop memory management techniques 4. Demonstrate the internals of UNIX operating system 5. Use the computing environment and various services of operating system for development of applications.					

COURSE CONTENTS

Unit 1: Operating System Principles [14hrs]

Evolution of Operating Systems, Structural overview, Types of Operating System and operations, Computing environments, Operating System Services, User - Operating Systeminterface, System calls and system programs, Operating System structure, Virtual machines.

Unit 2: Process Management [12hrs]

Process concept, process scheduling, Operations on processes, Inter process communication. Multi-Threaded Programming, Overview, Multithreading models, Thread Libraries, threading issues. Process scheduling: Basic concepts, scheduling criteria, Scheduling algorithms, Multiple Processor scheduling Thread scheduling.

Unit 3: Memory Management [12hrs]

Memory Management Strategies, Swapping, contiguous memory allocation, Paging, structure of page table, Segmentation. Virtual Memory Management: Background, Demand paging, copy-on-write, Page replacement, Allocation methods, Thrashing.

Unit 4: UNIX kernel and its file **[12hrs]**

Introduction to Kernel: Architecture of the UNIX operating system, Introduction to system concepts, Kernel data structures, System Administration, Internal representation of Files: Inodes, structure of a regular file, Directories, Conversion of a path Name to an Inode, Super block,Inode assignment to a new file, Allocation of disk blocks, other file types.

Text Books:

1. Abraham Silberschatz, Peter Bear Galvin, Greg Gagne, 'Operating System Principles', Wiley Asia Student Edition 2009.
2. William Stallings, 'Operating Systems: Internals and Design Principles', Prentice Hall of India, seventh edition 2011.
3. Maurice J. Bach, 'The Design of the UNIX Operating System', Pearson Education; Prentice Hall of India, 2004.

Reference Books:

1. D. M. Dhamdhere, 'Operating Systems: A Concept-Based Approach,' Tata McGraw Hill, 2002.
2. Charles Crowley, 'Operating System: A Design-oriented Approach', Irwin Publishing, 2002.
3. Gary J. Nutt; 'Operating Systems: A Modern Perspective', Addison-Wesley, 2011.
4. Springer transaction for advance in Distributed computing and middleware.
5. IEEE transaction for Real time operating system.
6. ACM transaction for embedded operating system

Sub Code: BTEE15F7501	**Testing and Commissioning of Electrical Equipment**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To enable students to understand the standard specifications of various electrical equipment as per BIS(Bureau of Indian Standard) 2. To enable the students to understand standard tests forinstallation of various electrical equipment as per BIS(Bureau of Indian Standard) 3. To enable the students to understand standard commissioning tests various electrical equipment as per BIS(Bureau of Indian Standard) 4. To enable the students to understand standard performance tests of various electrical equipment as per BIS(Bureau of Indian Standard)					
Course Outcomes	On completion of this course the students will be able to:					

	1. Be able to describe the standard specifications of various electrical equipment. 2. Be able to describe the standard tests, specifications for installation of various electrical equipment 3. Be able to describe the commissioning tests on various equipment 4. Be able to describe the performance tests on various equipment

COURSE CONTENTS

Unit 1: Transformers **[12hrs]**

Specifications: Power and distribution transformers as per BIS standards.

Installation: Location, site, selection, foundation details (like bolts size, their number, etc.), code of practice for terminal plates, polarity & phase sequence, oil tanks, drying of windings andgeneral inspection.

Commissioning tests: Following tests as per national & International Standards, volt ratio test, earth resistance, oil strength, Bucholz & other relays, tap changing gear, fans & pumps, insulation test, impulse test, polarizing index, load & temperature rise test.

Specific Tests: Determination of performance curves like efficiency, regulation etc, and determination of mechanical stress under normal &abnormal conditions.

Unit 2: Synchronous Machines **[12hrs]**

Specifications: As per BIS standards.

Installation: Physical inspection, foundation details, alignments, excitation systems, cooling and control gear, drying out. 2 hours

Commissioning Tests: Insulation, Resistance measurement of armature & field windings, waveform & telephone interference tests, line charging capacitance

Performance tests: Various tests to estimate the performance of generator operations, slip test, maximum lagging current, maximum reluctance power tests, sudden short circuit tests, transient & sub transient parameters, measurements of sequence impedances, capacitive reactance, and separation of losses, temperature rise test, and retardation tests.

Factory tests: Gap length, magnetic eccentricity, balancing vibrations, bearing performance

Unit 3: Induction Motors **[13hrs]**

Specifications: for different types of motors, Duty, I.P. protection.

Installation: Location of the motors (including the foundation details) & its control apparatus, shaft & alignment for various coupling, fitting of pulleys & coupling, drying of windings.

Commissioning Test: Mechanical tests for alignment, air gap symmetry, tests for bearings, vibrations & balancing. 5 Hours Electrical Tests: Insulation test, earth resistance, high voltage test, starting up, failure to speed up to take the load, type of test, routine test, factory test and site test (in accordance with ISI code)

Specific Tests: Performance & temperature raise tests, stray load losses, shaft alignment, and re-rating & special duty capability.

Unit 4: Switch Gear & Protective Devices **[8hrs]**

Standards, types, specification, installation, commissioning tests, maintenance schedule, type & routine tests.

Text Books:

1. S. Rao, 'Testing & Commissioning Of Electrical Equipment',
2. B .V. S. Rao, 'Testing & Commissioning Of Electrical Equipment'

Reference Books:

1. Relevant Bureau of Indian Standards
2. H. N. S. Gowda, 'A Handbook on Operation and Maintenance of Transformers'
3. Transformer & Switch Gear Handbook -Transformers-BHEL, J &P, J & P

Sub Code: BTEE15F7502	**Electricity Regulations**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To understand the Indian Electricity rules 1956. 2. To understand the provisions provided in Indian Electricity Act 2003. 3. To highlight about the Electricity scenario in India 4. To provide the first hand information and knowledge on KERC & CERC guidelines for power generation, transmission and distribution					
Course Outcomes	On completion of this course the students will be able to:					

	1. Apply the electricity rules 1956 for electrical equipment and also power systems. 2. Apply the provisions given in Electricity act 2003 in Electrical power generation, transmission and distribution system. 3. Adopt the norms given by KERC and CERC for power system. 4. Gain knowledge on open access, power trading, power wheeling, power banking and ABT.

COURSE CONTENTS

Unit 1: **[14hrs]**

Overview of Power Sector: Electricity Scenario at National Level and State Level with Key Statistics relating to Generation, Transmission and Distribution of power.

Organizational Set up and Introduction to Electricity Laws – A brief discussion on functional set up of power sector at national and state level and connectivity among different statutory entities and introduction to EA 2003, EC 2001 and KER Act 1999.

Over View of Regulations Governing Electricity Generation and Transmission – A brief description of Key regulations issued by CERC and KERC on Generation and Transmission activity.

Over View of Regulations Governing Distribution & Trading - A brief description of key regulations issued by CERC and KERC on Distribution and Trading activity.

Unit 2: **[14hrs]**

Provisions relating to Electricity Generation in Act 2003 and related case studies Sl. No. 7, 8, 9, 10 & 11 of Electricity ACT 2003.

Provisions relating to Grid Operation in Act 2003 and related case Studies Sl. No. 25, 26,27,28, 29, 30, 31, 32, 33 & 34 of Electricity ACT 2003

Provision of Power generation by Distributed generations (DG) and interconnection with grid norms from Central Electricity Authority Grid code 2010

Unit 3: **[14hrs]**

Provisions Relating to Electricity Transmission and related cases Sl. No. 38, 39, 40 & 41 of Electricity ACT 2003

Provisions Relating to Electricity Distribution in Act 2003 and related case studies Sl. No. 42, 43, 55, 56 & 135 of Electricity ACT 2003

Key Technical Aspects relating to supply of electricity and supply code

Unit 4: **[14hrs]**

Safety in Supply of Electricity - Regulations and Case studies - Safety Regulations issued by CEA.

Electricity Trading and Power Business Trading Regulations issued by CERC and KERC, & Case Studies

Electricity Tariffs – Provisions in the Act, related regulations and case studies Sl. No. 61, 62, 63, 64 & 65 of Electricity Act 2003, Open excess, wheeling & banking of power, Availability Based Tariff (ABT)

Text Books:

1. Electricity Act 2003, Kamal Publishers; 2017 edition (2017).
2. The Electricity Rules, 2005 & the Indian Electricity Rules, 1956 (Latest Bare Act),
3. Central Electricity Authority Grid code 2010, http://www.cea.nic.in/reports/regulation/tech_std_reg.pdf.
4. Website http://bescom.org/en/wheeling-bankingopen-access/
5. Website http://www.forumofregulators.gov.in/Data/study/STUDY_ON_ANALYSIS_OF_TARIFF_ORDERS&OTHER_ORDERS_OF_STATE_ELECTRICITY_REGULATORY_COMMISSIONS.pdf

Sub Code: BTEE15F7503	**Non-Conventional Energy Sources**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To analyze the environmental and cost economics of using renewable energy sources compared to fossil fuels. 2. To understand the solar geometry required to estimate the solar radiation. 3. To estimate maximum power available in wind. 4. To introduce various renewable energy conversion technologies like Biomass, Geothermal, Ocean energy. 5. To introduce Magnetohydrodynamic system and energy storage					

	systems
Course Outcomes	On completion of this course the students will be able to: 1. Select the appropriate renewable energy as an alternate for conventional power in any application. 2. Design solar PV module for any given application. 3. Deduce maximum power available in any given location. 4. Acquire the knowledge of modern energy conversion technologies. 5. Understand characteristics of the storage systems

COURSE CONTENTS

Unit 1: **[12hrs]**

Introduction: Energy Sources and their availability, renewable energy sources, Prospects of renewable energy sources.

Energy Scenario: Energy needs of India – Energy consumption patterns – Worldwide Potentials of these sources – Energy efficiency – Energy security – Energy and its environmental impacts – Global environmental concern – Kyoto Protocol.

Unit 2: **[12hrs]**

Solar Energy: Introduction, Solar Constant, Basic Sun-Earth Angles – definitions and their representation, Solar Radiation Geometry (numerical problems), Estimation of Solar Radiation of Horizontal and Tilted Surfaces (numerical problems);

Solar thermal Systems – Types of collectors – Collection systems – Applications – Photo Voltaic (PV) technology – Solar cells – Cell technologies – Characteristics of PV systems – Equivalent circuit – Building integrated PV system and its components – Sizing and economics – Peak power operation – Standalone and grid interactive systems.

Wind Energy: Energy available from wind, General formula, Lift and drag. Basic principles of Wind Energy Conversion Systems (WECS), Classification of WECS, Parts of WECS, Derivation for Power in the wind, Electrical Power Output and Capacity Factor of WECS, Wind site selection consideration, Advantages and Disadvantages of WECS.

Unit 3: **[12hrs]**

Bio Mass Energy: Biomass conversion technologies bio mass generation, classification of Bio Gas Plants, Factors affecting Biogas generation, Biomass program in India.

Geothermal Energy: Sources of Geothermal energy Estimation of Geothermal Power, Geothermal Power Plants, Geothermal energy in India and Prospects.

Ocean Energy: Ocean thermal energy conversion(OTEC), Principle of OTEC system, Methods of OTEC power generation, site selection, Prospects of ocean energy in India, – Principle of Tidal Power, Tidal Power Plant, Prospects in India.

Unit 4: **[12hrs]**

MHD & Hydrogen Energy: Basic Principle of MHD (magnetohydrodynamic) system, advantages, Power OUTPUT of MHD Generation, future Prospects. Principle and classification of fuel cell energy, hydrogen as alternative fuel for Generation of Electrical Energy & applications.

Energy Storage: Battery – Types – Equivalent circuit – Performance characteristics – Battery design – Charging and charge regulators – Battery management – Fly wheel energy relations – Components – Benefits over battery – Storage systems – Ultra capacitors.

Text Books :

1. Rai, G. D., 'Non-Conventional Energy Sources', Khanna Publishers, 5th edition.
2. D.P Kothari, K.C.Singla, Rakesh Ranjan, 'Renewable Energy Sources and Emerging Technologies', PHI Publications.
3. Bansal Keemann, Meliss, 'Renewable energy sources and conversion technology', Tata McGraw Hill.

Reference Books:

1. Mittal, 'Non-conventional Energy Systems', Wheelers Publication.
2. Ramesh R & Kumar K U, 'Renewable Energy Technologies', Narosa Publishing House

Sub Code: **BTEE15F7504**	**Fuzzy Logic Control Systems**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**

Course Objectives:

1. To enable students to know the principle of fuzzy logic control.
2. To enable students to describe the formulation of fuzzy logic system.
3. To enable students to understand the multilevel control of fuzzy system
4. To enable students to understand the concept of adaptive fuzzy control system.

Course Contents:

UNIT-I: **[14L]**

Review of Fuzzy sets, basic operations, advanced operations, Fuzzy relations, extension principles, linguistic variables Fuzzy if-then-rule, Fuzzy logic and approximate reasoning Fuzzy rule base, inference engine, fuzzification and defuzzification, Fuzzy system as non-linear mapping, approximate properties of fuzzy systems.

UNIT-II: **[14L]**

Design of fuzzy system using table lookup, gradient dissent training, recursive least squares, clustering Fuzzy control of linear systems, SISO system and MIMO systems, optimal and roust control.

UNIT-III: **[14L]**

Analysis and design of multilevel control, gain scheduling of PID controllers.

UNIT-IV: **[14L]**

Adaptive fuzzy control, design of indirect, direct and combined adaptive fuzzy controllers Advanced adaptive fuzzy controllers.

Text Books and References:

1. Wang Li-Xin, “A course in Fuzzy system & Control”, Prentice Hall
2. Timothy, J.R., “Fuzzy Logic with Engineering Application” McGraw Hill, 2000.
3. Hung T Nguyen and elbert A Walker, “A first course in Fuzzy logic:, CRC press 3rd Edition

Course Outcomes:

On completion of this course the students will be able to:

1. Know the concept of fuzzy system
2. Form fuzzy rules for a specific application.
3. Apply mathematical concept to formulate fuzzy logic rules
4. Apply fuzzy rules for a buck converter.

Sub Code: BTEE15F7700	**Relay and High Voltage Lab**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Weeks		**2**	**1**	**0**	**1**	**3**
Course Objectives:	1. To make the students gain the knowledge of operation of over current, under voltage relays. 2. To measure HVAC and HVDC using spheres. 3. To analyze the characteristics of fuse.					
Course outcomes	At the end of this course, Student will be able to: 1. Develop skills to measure HVAC and HVDC parameters. 2. To understand the operation of different relays					

List of Lab Experiments:

1. Determination of current time characteristics of electro mechanical over current relay.
2. Determination of current time characteristics of Microcontroller based over current relay.
3. Determination of operating characteristics of Microcontroller based Under voltage relay.
4. Observing the operation of Motor protection Relay for various faults.
5. Observing the operation of Negative Sequence Relay.
6. To draw operating characteristics of fuse under constant current and constant length conditions.
7. Determination of break down strength of liquid dielectric.
8. Measurement of HVAC using standard spheres.
9. Measurement of HVDC using standard spheres.
10. Measurement of HVAC for different electrode configurations.
11. Field mapping using Electrolytic tank for capacitor model

Sub Code: BTEE157800	**Power System Simulation Laboratory**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Weeks		**2**	**1**	**0**	**1**	**3**
Course Objectives:	1. To enable the students gain a fair knowledge on the programming and simulation of Power Electronics and Power Systems					
Course outcomes	At the end of this course, Student will be able to: 1. Acquire skills of using computer packages MATLAB coding					

	and SIMULINK in power electronics and power system studies. 2. Acquire skills of using ETAP software for power system studies

List of Lab Experiments:

1. Formation of Z bus (without Mutual coupling) using Z bus building Algorithms.
2. Y bus formation for power systems with & without mutual coupling, by singular transformation and inspection method.
3. Determination of bus currents , bus power and line flow for a specified system voltage(Bus) profile.
4. ABCD Parameters: Formation for symmetric π/T configuration. Verfication of AD- BC = 1, Determine the efficiency and regulation.
5. Determination of power angle diagrams, reluctance power, excitation emf and regulation for salient and non salient pole synchronous machines.
6. Formation of Jacobian for a system not exceeding 4 buses (no PV buses) in polar co ordinates.
7. To determine faults currents and voltages in single transmission line system with star- delta transformers at a specified location for LG, LLG.
8. Load flow analysis using Gauss Siedel method and N-R method for both PQ & PV buses.
9. Optimal generation scheduling for thermal power plants.

Note: 1. Experiments: 1 to 6: Simulation experiments using MATLAB/ C/ C++
2. Experiments: 7 to 9: Use Suitable standard software Package

VIII Semester

SL	Course Code	Title of the Course	HC/ SC/ OE	C	L	T	P	CH
1	BTEE15F8100	Project Phase II	HC	8	0	1	7	16
2	BTEE15F8201	Operation and Control of Power Systems	SC	4	3	1	0	5
	BTEE15F8202	Introduction to Flexible AC transmission system						
	BTEE15F8203	Estimation and Design of Electrical Installation						
	BTEE15F8204	Artificial Neural Network						
3	BTEE15F8301	Electrical Power Quality	SC	4	3	1	0	5
	BTEE15F8302	Electrical Distribution system						
	BTEE15F8303	Electrical Safety						
4	BTEE15F8401	Management & Entrepreneurship	SC	4	3	1	0	5
	BTEE15F8402	Electrical Energy Conservation						
	BTEE15F8403	Computer Control of Electric drives						
	BTEE15F8404	Trouble Shooting of Common Electrical Appliances						
TOTAL CREDITS				**20**	**9**	**4**	**7**	**31**

Sub Code: BTEE15F8100	**Project Phase - II**	**C**	**L**	**T**	**P**	**CH**
Duration :14 Weeks		**8**	**0**	**1**	**7**	**16**
Course Objectives:	1. Identify and practice research ethics and responsible to conduct in research 2. To know and apply problem solving skills to constructively address research setbacks 3. To work collaboratively with other researchers, using listening and communication skills 4. To work autonomously in an effective manner and setting and meeting deadlines 5. To reflect on their own research, identifying lessons learned, strengths, and ways to improve 6. To communicate confidently and constructively withfellow graduate students and faculty as mentors 7. To explain their research to others in the field and to broader audiences through research presentations 8. To articulate the relevance of their research to their coursework and professional future, synthesizing their research, academic, and professional interests and goals 9. To identify and describe what they could expect as a					

	graduate student 10. To reflect constructively on their research experience in making decisions about their future.
Course outcomes	At the end of this course, Student will be able to: 1. Apply relevant knowledge and skills, within the main area, to a given problem - within given constraints, 2. Analyze and discuss complex inquiries/problems and handle larger problems independently even with limited information 3. Evaluate and critically assess one's own and others' scientific results 4. Document and present one's work with strict requirements on structure, format, and language usage 5. Identify one's need for further knowledge and continuously develop one's own knowledge

GUIDELINES

Guidelines for the preparation of the Report: As per the University Guidelines

Guidelines for the Evaluation:

1. Student has to submit a progress report -I and give the presentation during C1 which carries 20% of the total marks
2. Students has to submit a progress report -II and give the presentation of the project work during C2, which carries 20% of the total marks
3. Students has to submit the Project Thesis and need to give a presentation of the project work and face Viva-Voce during C3, which carries 60% of the total marks
4. All the above reports must undergo a plagiarism check which should not exceed 25% and failing which lead to resubmission

Sub Code: BTEE158201	**Operation and Control of Power Systems**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To provide students the knowledge of Economic Load Dispatch used in the power system and Load Frequency Control (LFC). 2. To provide a solid foundation in mathematical and engineering fundamentals required to control the governing system in Turbine models. 3. To provide the knowledge of hydrothermal scheduling, Unit					

	Commitment problem. 4. To provide the knowledge of SCADA and the concepts of Deregulation
Course Outcomes	On completion of this course the students will be able to: 1. To make students understand Economic operation of power system and importance of LFC control. 2. To allow students discuss about thermal and hydro power plants operation in meeting the load demand optimally. (State and central wide installation). 3. To improve student's ability in solving problems (numerical problems at present) by posing different problem models related to Economic Load Dispatch, Load Frequency Control. 4. Apply their knowledge in PSOC for competitive exams like GATE, IES, and Public sector etc. 5. Ability to discuss single area load frequency control and two area load frequency control. 6. Ability to model and design turbine and Automatic controller. 7. Ability to express variation of frequency in the power system with varying load

COURSE CONTENTS

Unit 1: Automatic Load Frequency Control: [12hrs]

Basic generator control loops, Exciter types, Exciter modeling, Generator modeling. Automatic Load frequency control of single area systems, Speed governing system, Turbine generator response, Static and dynamic performance of speed governor, Closing of ALFC loop, Concept of control area, Static response of primary ALFC loop, Integral control, ALFC of multi-control area systems (POOL operation), The Two-Area system, Modeling the Tie-Line, Block Diagram representation of Two-Area system, Static response of Two-Area system and Tie-Line Bias control.

Unit 2: Optimal System Operation and Unit Commitment: [10hrs]

Introduction , Optimal operation of generators on a bus bar, Statement of the Unit Commitment problem, need and importance of unit commitment, Constraint in Unit Commitment, Unit Commitment solution methods-Priority lists method, Forward Dynamic Programming method(excluding problem), Spinning reserve.

Unit 3: Economic Operation of Power Systems [10hrs]

Introduction, Performance curves, Economic generation scheduling neglecting losses and generator limits, Economic generation scheduling including generator limits and neglectinglosses; Iterative techniques; Economic Dispatch including transmission losses – approximate

penalty factor, iterative technique for solution of economic dispatch with losses; Derivation of transmission loss formula; Optimal scheduling for Hydrothermal plants – problem formulation, solution procedure and algorithm.

Unit 4: SCADA and Power System De-Regulation [10hrs]

Introduction- SCADA, Motivation for restructuring of power systems- Electricity market entities model benefits of deregulation- Terminology-Deregulation in Indian power sector-Operations in power markets-Power pools-Transmission networks and electricity markets

Text Books:

1. Nagrath, I. J., and Kothari, D. P, 'Modern Power System Analysis', TMH, 3rd Edition, 2003.
2. A.J.Wood & B.F.Woollenberg, 'Operation and Control', John Wiley Power Generation, 2nd edition.

Reference Books:

1. P.Venkatesh. B.V.Manikandan, S.Charles Raja, A.Srinivasan, 'Electrical power systems: Analysis, security, Deregulation', PHI 2012.
2. A. Chakravarthi and S. Halder, 'Power System Analysis Operation and Control ', PHI, 3rd Edition.
3. O I Elgerd, 'Electric Energy Systems', Mc Graw-hill.

Sub Code: BTEE15F8202	**Introduction to Flexible AC Transmission Systems**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To emphasis the need for FACTS controllers. 2. To review the static devices for series and shunt control. 3. To study the operation of controllers for enhancing the transmission capability					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the need of flexible AC transmission and the associated problems. 2. Describe the characteristics, applications and modelling of series and shunt FACTS controllers. 3. Analyze the interaction of different FACTS controller with the power system					

COURSE CONTENTS

Unit 1: AC Transmission Line and Reactive Power Compensation [8hrs]

Transmission, interconnection, flow of power in AC system, power flow and dynamic stability consideration of a transmission interconnection, relative importance of controllable parameters, basic types of FACTs controllers, shunt, series, combined shunt and series connected controller

Unit 2: Voltage Sourced Converters [12hrs]

Power semiconductor devices: types of high power devices, principle of high power device characteristics and requirements, power device material, diode, MOSFET, MOS turn OFF thyristor, emitter turn OFF thyristor, integrated gate commuted thyristor (GCT & IGCT).

Voltage sourced converters: Basic concepts, single-phase full wave bridge converter operation, and square wave voltage harmonics for a single-phase bridge 3-phase full wave converters.

Unit 3: Static Series Compensators [8hrs]

GCSC, TSSC, TCSC and SSSC, objectives of series compensation, variables impedance type of series compensation, switching converter type series compensation, external control for series reactive compensators.

Unit4: Self and Line Commutated Current Source Converter [12hrs]

Basic concepts, 3 phase full wave rectifier, thyristor based converter, current sourced converter with turnoff devices, current sourced versus voltage source converter.

STATIC SHUNT COMPENSATORS SVC AND STATCOM: Objective of shunt compensation, methods of controllable Var generation, Static Var Compensator (SVC) and STATCOM, comparison between SVC and STATCOM.

Text Books:

1. N.G.Hungorian & Laszlo gyugyi, 'Understanding Facts - Concepts and technology of flexible AC Transmission system', IEEE Press, standard publisher, 2001.

Reference Books:

1. S.Rao, 'EHV - AC, HYDC Transmission & Distribution Engineering', Khanna publishers, 3rd edition 2003.
2. K.R. Padiyar, 'FACTS - Controllers in Power Transmission distribution', New age publishers, 2007.

Sub Code: BTEE15F8203	**Estimation and Design of Electrical Installations**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To enable students to describe the standard specifications of					

	various electrical components for wiring 2. To enable students to describe the standard tests, specifications for installation of various electrical installation. 3. To enable students to design simple residential ,commercial and power installation ,overhead lines, transmission lines , substations 4. To enable students to estimate material required for simple residential ,commercial and power installation ,overhead lines, transmission lines , indoor and outdoor substations
Course Outcomes	On completion of this course the students will be able to: 1. Be able to describe the standard specifications of various electrical components for wiring 2. Be able to describe the standard tests, specifications for installation of various electrical installation 3. Be able to design simple residential ,commercial and power installation ,overhead lines, transmission lines , substations 4. Be able to estimate material required for simple residential ,commercial and power installation ,overhead lines, transmission lines , indoor and outdoor substation

COURSE CONTENTS

Unit 1: Introduction to estimation & costing [4Hrs]

Introduction to estimation & costing, Electrical Schedule, Catalogues Market Survey and source selection, Recording of estimates, Determination of required quantity of material ,Labor conditions, Determination of cost material and labor, Contingencies ,Overhead charges, Profit, Purchase system, Purchase enquiry and selection of appropriate purchase mode, Comparative statement, Purchase orders, Payment of bills , Tender form, General idea about IE rule, Indian Electricity Act and major applicable I.E rules

General rules guidelines for wiring of residential installation [6Hrs]

Positioning of equipments, Principles of circuit design in lighting and power circuits Procedures for designing the circuits and deciding the number of circuits, Load calculations and selection of size of conductor, Selection of rating of main switch, distribution board, protective switchgear ELCB and MCB and wiring accessories Method of drawing single line diagram, Selection oftype of wiring Rating of wires and cables Earthling of residential Installation Sequence to be followed for preparing estimate, Preparation of detailed estimates of materials of residential installation

Unit 2: Service connection, Inspection & Testing of Installation [4hrs]

Concept of service connection, Types of service connection and their features, Method of installation of service connection, Estimates of under ground and overhead service connections Inspection of internal wiring installations, Inspection of new installations,Testing of installations, Testing of wiring installations ,Reason for excess recording of energy consumption by energy meter

Electrical installation for power circuits: [6hrs]

Introduction, important considerations regarding motor installation wiring Determination of input power, Determination of input current to motors, Determination of rating of cables, determination of rating of fuse, Determination of size of Condit, distribution Board, Main switch and starter , Detailed steps for problem

Unit 4: Design & Material Estimation of over head Transmission and Distribution lines [12hrs]

Introduction, Typical AC electrical power system, Main components of overhead lines. line supports, Factors governing height of pole, Conductor materials ,Determination of size of conductor for overhead transmission line, Cross arms, Pole brackets and clamps, Guys and Stays, Conductors configuration spacing and clearances, Span lengths, Overhead line insulators, Insulator materials, Types of insulators, Lightning Arrestors, Phase plates, Danger plates, Anti climbing devices, Bird guards, Beads of jumpers, Muffs, Points to be considered at the time of erection of overhead lines..Erection of supports, Setting of stays, Fixing of cross arms, Fixing of insulators, Conductor erection. Repairing and jointing of conductor, Dead end clamps, Positioning of conductors and attachment to insulators, Jumpers, Tee-offs. Earthing of transmission lines, Guarding of overhead lines, Clearances of conductor from ground, Spacing between conductors .Testing and commissioning of overhead distribution lines, Some important specifications. Design procedure for 11kV destitution(HT line) .Components used in over head transmission line. Specification of materials used in transmission line. Design procedure for transmission line

Unit 4: Design & estimation of substation [8hrs]

Introduction, Classification of substation, Indoor substations, Outdoor substations, Selection and location of site for substation Main Electrical Connections, Graphical symbols for various types of apparatus and circuit elements on substation main connection diagram Key diagram of typical substations . Equipment for substation and switchgear installations, Substation auxiliaries supply, Substation Earthing. Design procedure and numerical

Text Books:

1. J.B. Gupta, 'Electrical Installation Estimating & Costing', VIII Edition, S.K. Katria & Sons New Delhi

Reference Books:

1. K.B.Raina S.K.Bhattacharya, 'Electrical Design Estimating and Costing', New Age International.
2. Uppal, 'Electrical Wiring Estimating and Costing', Khanna Publishers Delhi
3. I.E.Rules and Act Manuals

Sub Code:BTEE15F8204	**Artificial Neural Network**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**2**	**0**	**5**
Course Objectives	1. Understand the role of neural networks in engineering, artificial intelligence, and cognitive modeling 2. Provide knowledge of supervised learning in neural networks 3. Provide knowledge of computation and dynamical systems using neural networks 4. Provide knowledge of reinforcement learning using neural networks. 5. Provide knowledge of unsupervised learning using neural networks. 6. Provide hands-on experience in selected applications					
Course Outcomes	1. Understand the role of neural networks in engineering, artificial intelligence, and cognitive modelling. 2. Understand Feed-forward neural networks of increasing complexity, gradient descent learning and extensions, learning and generalization theory 3. Competitive learning, Self-organizing feature maps 4. Understand the concepts and techniques of neural networks through the study of the most important neural network models.					

	5. Gain knowledge of sufficient theoretical background to be able to reason about the behavior of neural networks. 6. Evaluate whether neural networks are appropriate to a particular application. 7. Apply neural networks to particular applications, and to know what steps to take to improve the performance.

COURSE CONTENTS

UNIT – I **[14 hr]**

Introduction : AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

Searching : Searching for solutions, uniformed search strategies – Breadth first search, depth first Search. Search with partial information (Heuristic search) Greedy best first search, A* search Game Playing: Adversial search, Games, minimax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

UNIT – II **[14 hr]**

Knowledge Representation & Reasons logical Agents, Knowledge – Based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in promotional logic, Resolution, Forward & Backward. Chaining.

First order logic. Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

UNIT – III **[14 hr]**

Characteristics of Neural Networks, Historical Development of Neural Networks Principles, Artificial Neural Networks: Terminology, Models of Neuron, Topology, Basic Learning Laws, Pattern Recognition Problem, Basic Functional Units, Pattern Recognition Tasks by the Functional Units.

Feed forward Neural Networks: Introduction, Analysis of pattern Association Networks, Analysis of Pattern Classification Networks, Analysis of pattern storage Networks. Analysis of Pattern Mapping Networks.

UNIT – IV **[14 hr]**

Feedback Neural Networks Introduction, Analysis of Linear Auto associative FF Networks, Analysis of Pattern Storage Networks.

Competitive Learning Neural Networks & Complex pattern Recognition Introduction, Analysis of Pattern Clustering Networks, Analysis of Feature Mapping Networks, Associative Memory.

Text books:

1. Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/ Pearson Education.
2. Artificial Neural Networks B. Yagna Narayana, PHI

References:

1. Artificial Intelligence, 2nd Edition, E.Rich and K.Knight (TMH).
2. Artificial Intelligence and Expert Systems – Patterson PHI.
3. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson.
4. PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition – Pearson Education
5. Neural Networks Simon Haykin PHI
6. Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition.

Sub Code: BTEE15F8301	**Electrical Power Quality**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To provide basic concepts about power quality issues like voltage variation and frequency variation in electrical distribution system. 2. To provide basic concepts about linear and non-linear loads and their effects on power quality. 3. To enable students to study the effects of power quality issues on performance of end-use equipments and distribution equipments like transformers, conductors, breakers, etc. 4. To expose students to the various techniques of alleviating power quality problems.					
Course Outcomes	On completion of this course the students will be able to: 1. Differentiate between linear and non-linear loads and their effects on power distribution system. 2. Take remedial measures against voltage flickers, harmonics and other power quality related issues so as to ensure safe operating conditions for equipment. 3. Interpret various international standards for control of harmonics, develop skills in measurement of harmonics and be aware of custom power devices for harmonic suppression. 4. Model an electrical industrial distribution system, carryout systematic harmonic analysis and design filters to suppress harmonics so as to comply with industrial standards.					

Unit 1: Power quality and voltage variation**:** **[14 hr]**

Power quality general: Introduction, linear loads, non-linear loads, power quality evaluation procedures term and definitions: general classes of power quality problems, transients, long duration voltage variation, short duration voltage variations, voltage imbalance, waveform distortion, power quality terms.

Voltage variation and transients: Sources of sags, swells and interruptions, estimating voltage sag performance, fundamental principles of protection, motor starting voltage sag. Sources of transient over voltages, impulse transients, oscillatory transients, voltage flicker, principles of over voltages protection, utility capacitor switching transients,

Unit 2: Harmonics **[14 hr]**

Fundamentals of harmonics: Harmonic distortion, harmonic sequences, harmonic indexes, harmonic sources from commercial loads, harmonic sources from Industrial loads, effects of harmonic distortion, interharmonics. Harmonic distortion evaluations, principles for controlling harmonics, harmonic studies, devices for controlling harmonic distortion, harmonic filters, standards of harmonics

Unit 3: Harmonic measurement, standard and bench marking **[14 hr]**

IEEE and IEC standards for measurement of harmonics, measurement of electrical parameters using rms meters and true rms meters, current and voltage total harmonic distortion, individual current and voltage harmonics, Current & voltage harmonic limits, power quality measurement equipments.

Power quality benchmark: Introduction, benchmark process, power quality contract, power quality state estimation, including power quality in distribution planning.

*Distributed generation***:** DG technologies, interface to utility system, power quality issues, interconnection standards.

Unit 4: Custom power devices and power quality monitoring **[14 hr]**

Principle and operation of custom power devices like DSTATCOM, Dynamic voltage restorer (DVR) & unified power quality conditioners (UPQC) to suppress power quality issues. Monitoring considerations, assessment of power quality measurement data, application of intelligent systems, power quality monitoring standards.

Text Books and References:

1. Electric Power Quality, Roger C. Dugan, Surya Santoso, Mark F. McGranaghan and H. Wayne Beaty, McGraw-Hill professional publication, 2nd edition, 2003.
2. Power Quality in Electrical Systems, Alexander Kusko and Marc T. Thompson, McGraw-Hill Companies, Inc., 2007.
3. Power Quality, C. Sankaran, CRC Press LLC, 2002.

4. Power quality enhancement using custom power devices, Arindam Ghosh and Gerard Ledwich, Kluwer Academic Publishers, 2002.
5. Power quality problems and mitigation techniques, Bhim Singh, Ambrish Chandra and Kamal Al-Haddad, Johny Wiley & Sons, Inc., 2014.
6. Electric Power Quality, G.T. Heydt, stars in a circle publications, 1991.
7. Modern Power Electronics, M.H. Rashid, TATA McGraw Hill, 2002.
8. Understanding power quality problems voltage sags and interruptions, Math H. J. Bollen, IEEE Press, 2000
9. Power quality in power systems and electrical machines, Ewald F Fuchs, A.S. Mohammad and Masoum, Academic Press, Elsevier, 2009.
10. IEEE papers on power quality

Sub Code: BTEE15F8302	**Electrical Distribution System**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To give an overview of the function of an electrical power distribution in an electric power system. 2. To have the wider knowledge on planning and design of a distribution infrastructure					
Course Outcomes	On completion of this course the students will be able to: 1. Describe the design of distribution system. 2. Analyze the different types of network. 3. Describe the optimization techniques involved in the planning of distribution system					

COURSE CONTENTS

Unit 1: Distribution System Planning and Design [10hrs]

Introduction, Factors affecting system planning, present planning techniques, planning models, Sub-transmission and substation design. Sub-transmission networks configurations, Substation bus schemes, Distribution substations ratings, Service areas calculations, and Substation application curves, future trends in planning, systems approach, and Distribution automation.

Unit 2: Distribution System Automation [10hrs]

Distribution Automation: Control functions– Communication system –Consumer Information Service– Geographical Information Systems. SCADA –block diagram –functions.
Energy Management: Supply Side Management–Demand Side Management–Technologies Implementation, Dispersed Generation.

Unit 3: System Planning [10hrs]

Planning process, planning criteria, system developers, dispersed generation, distribution systems, economics and finance, mapping. Load Characteristics - Basic definition, relationbetween load and load factor, load growth.

Reliability-Basic reliability concept –Cost verses system Reliability –Reliability planning procedure–Mathematical concept.

Unit4: Optimization [10hrs]

Introduction, costing of schemes, typical network configurations, planning terms, network cost modeling, synthesis of optimum line network**.**

Text Books:

1. Turan Gonen, 'Electrical Power Distribution Engineering', Tata McGraw-Hill Publishing company Ltd, 1986.
2. Pabla A S, 'Electrical Power Distribution Systems', 5th Edition, TMH, 2004.
3. Dr. Khedkar M K, Dr. Dhole G M, 'A Textbook of Electric Power Distribution Automation', University Science Press, Delhi, Laxmi Publications, 2010

References:

1. LucesM. Faulkenberry, WalterCoffer, 'Electrical Power Distribution and Transmission', Pearson education, 1996, ISBN978-81-317-0709-8.
2. ColinBayliss, 'Transmission and Distribution Engineering', Butterworth Heinemann,1996.
3. KankarBhattacharya, Math H. JBollen, JaapE. Daalder, 'Operation of Restructured Power Systems', Kluwer academic publishers, USA, First Edition, 2001

Sub Code: BTEE15F8303	**Electrical Safety**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To understand the importance of electrical safety in work place as well as at dwellings. 2. To provide an overview of information regarding use of safe electrical equipment. 3. To understand the importance of use of safety gadgets, safe practices while working on electrical equipment. 4. To understand and need of protection to avoid electrical hazards. 5. To understand the different electrical safety standards and practice regularly					

Course Outcomes	On completion of this course the students will be able to: 1. Understand the basic electric safety norms. 2. Adopt the best & safe practices while doing electrical work. 3. Understand the various IE rules for safe operation. 4. Understand the importance of earthing and other related safety equipments 5. Use the appropriate electrical gadgets like MCBs, Fuses, ELCB, wire sizes, Switch sizes, etc.

COURSE CONTENTS

Unit 1: General Electric Safety **[13hrs]**

Basic concept of Electric safety, Hazards of electricity, Parameters affecting electric shock intensity and Effects of electricity on human body. Step potential and touch potential. Electrical safety standards like IE Rule 1956 and Electricity Act 2003. National and International Safety codes. Electrical joints & end terminations and temperature variation.

Unit 2: Causes of accidents and best practices [**14hrs]**

Electrical safety work practices, Causes of accidents, Unsafe acts, Best practices, Electrical safety guidelines for transformers, switchgears, motors, lifts, inverters, electrical home appliances, etc.

Unit 3: Earthing **[12hrs]**

Type of earthing, Importance of earthing, Measurement of ground resistance, Soil resistivity, Parameters affecting earthing, Measurement of earth resistance, maintenance of earthing.

Unit 4: Safety Gadgets and safety equipment **[15hrs]**

Safety communications like sign boards, lock out tags, etc., Use of Personal protection Equipments (PPE), Use of Earth Leakage Circuit Breakers (ELCB), Molded circuit breakers (MCBs), Molded case circuit breakers, Different types of fuses, Electrical safety gadgets. Lightning Arrestors, Earth leakage relays.

References:

1. National Electrical Code 2011, Bureau of Indian Standard, 2011.

2. Handbook for Electrical Safety, Cooper Bussmann, Inc., St. Louis, MO 63178-4460, http://www.bussmann.com
3. Electrical Workers' Safety Handbook, e-contractors
4. www.ibew38.org/pdf/safety_handbook.pdf.
5. The safe use of Electricity in the home, www.esb.ie/esbnetworks

Sub Code: BTEE15F8401	**Management and Entrepreneurship**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To explain the basic concepts, principles, and processes of management. 2. To use the elements of effective decision making–research, assessment and consequence. 3. To develop the abilities to plan for effective communication – learn how to reflect, present and evaluate communication. 4. To Analyse organizational practices that facilitate creativity and innovation 5. To Integrate functional areas into strategic business problems from a general management perspective 6. To develop an ability to work with moral and ethical dilemmas and make decisions using critical thinking					
Course Outcomes	On completion of this course the students will be able to: 1. Integrate management concepts in a technical and innovative setting as required by today's dynamic business environment 2. Possess relevant skills preparing students for entry into management careers in business, government, public, or social service organizations 3. Analyse a business case, propose a creditable solution to a business problem and support your decision with strong arguments. 4. Propose his/her own business ideas and present it to a relevant audience. 5. Apply elements of effective decision making to areas that are central to career development – self assessment, market conditions and planning.					

COURSE CONTENTS

Unit 1: Introduction to management principles [10hrs]

Development of Management Thought-Early Management Approaches-Modern Management Approaches, Introduction - Meaning - nature and characteristics of Management, Scope and

functional areas of Management - Management as a Science, Art or Profession, Management & Administration, Levels of Management, Roles of Manager. Communication-meaning and importance-Forms and types of communication

Unit 2: Management Process [16hrs]

PLANNING-Nature, importance and purpose of planning process - Objectives - Types of plans (Meaning only), Importance of planning - steps in planning & planning premises - Hierarchy of plans. Decision Making, Organisation- Nature and purpose of organization - Principles of organization -Types of organization, Staffing-Nature and importance of Staffing -Process of Selection & Recruitment (in brief). Meaning and nature of directing - Leadership styles, Coordination- meaning and importance and Techniques of Co – ordination.

Unit 3: Project Preparation [10hrs]

The Management for Engineers-Personal Management-Personal Management-Objective setting-Self Appraisal Preparation Of Project-Meaning of Project; Project Identification; Project Selection; Project Report; Need and Significance of Report; Contents; formulation; Guidelines by Planning Commission for Project report; Errors of Project Report; Project Appraisal.

Unit 4: Entrepreneurship [16hrs]

Entrepreneurship concept – Entrepreneurship as a Career – Entrepreneurial Personality - Characteristics of Successful, Entrepreneur – Knowledge and Skills of Entrepreneur. Stages in entrepreneurial process; Role of entrepreneurs in Economic Development; Entrepreneurship in India; Entrepreneurship – its Barriers,.

Small Scale Industry- Objectives; Scope; role of SSI in Economic Development. Advantages of SSI Steps to start an SSI - Government policy towards SSI;Different Policies of S.S.I.; Government Support for S.S.I. during 5 year plans, Impact of Liberalization, Privatization, Globalization on S.S.I., Effect of WTO/GATT Supporting Agencies of Government for S.S.I. Meaning

Text books:

1. P. C. Tripathi, P. N. Reddy ‘Principles of Management’, Tata McGraw Hill, 4th Edition, 2010.
2. Vasant Desai, ’Dynamics of Entrepreneurial Development & Management’, Himalaya Publishing House.
3. Poornima M Charantimath, ‘Entrepreneurship Development - Small Business Enterprises’, Pearson Education, 2006.

Reference Books:

1. Robert Lusier, ‘Management Fundamentals - Concepts, Application, Skill Development’ Thomson.
2. S S Khanka - S Chand & Co, ‘Entrepreneurship Development’.
3. Stephen Robbins, ‘Management’, Pearson Education /PHI -17th Edition, 2003

Sub Code: BTEE15F8402	Electrical Energy Conservation	C	L	T	P	CH
Duration: 14 Weeks		4	3	1	0	5
Course Objectives	1. To understand the present energy scenario of energy generation and to understand the gap between energy supply & demand 2. To make students to understand the need for energy conservation to save the primary fuel for future generation and also to reduce the environmental burden. 3. To provide an overview of various energy conservation opportunities for electrical equipment. 4. To study the importance of energy conservation for reduction of environmental burden. 5. To understand the importance of energy security and energy growth by implementation of energy conservation measures					
Course Outcomes	On completion of this course the students will be able to: 1. Understand the energy losses in different equipment and control the losses 2. Develop capability in measurement and analysis of data to conserve energy. 3. Conduct performance test on electrical equipment and calculate the energy efficiency of equipment. 4. Develop the awareness on controlling of environmental pollution through implementing energy conservation measures. 5. Become an energy auditor and conduct energy audit					

COURSE CONTENTS

Unit 1: Energy management **[8hrs]**

Energy sources, Types of Energy generation systems, Primary fuel and secondary fuel, Gap between energy supply and demand, Energy Conservation Act 2001, Energy audit, Types of energy audits, Preliminary energy audit, Detailed energy audit, Instruments used for energy audit, Energy conservation opportunities, Classification of energy conservation measures, Energy economic feasibility study, simple payback period, time value of money, cash flow, cost to benefit ratio, Reduction of environmental pollution, Energy audit reporting, Star labeling of electrical appliances and problems.

Unit 2: Demand and Power factor management [6hrs]

Demand management and Power factor management: Maximum demand, two part tariff, demand controller, concept and application of TOD metering system, smoothening of demand curve, fixed reactive power compensation, automatic reactive power compensation, APFC panels, economics of reactive power compensation and problems

Unit 3: Illumination system [8hrs]

Types of lamps used, principle of discharge lamps, performance of fluorescent lamps, compact fluorescent lamps, Lamps efficacy, Colour rendering index (CRI), Installed load efficacy ration (ILER), Types of street lights, Sizing of lighting equipments, Conventional coil wound ballasts, Electronic ballasts, Effect of voltage variation on lighting equipment, illumination level for different applications, LED lighting system and problems.

Unit 4: Electric Equipment [6hrs]

Energy conservation in motors: load factor, speed, efficiency, power factor, energy efficient motor, different speed control techniques, variable frequency drives, soft starters, rewinding of motors, and variation of power supply parameters like voltage variation, voltage unbalance and problems.
Energy conservation in transformers: Voltage ratio, loading of transformers, on-load & off load tap changers, power factor on secondary, unbalanced load on secondary, transformer management and problems.
Energy conservation in Air-conditioning system and Air compressors

References:

1. S. Rao and B.B. Parulekar, 'Energy Technology', 4th edition, Khanna Publishers, 2005.
2. Eastop & Croft D.P, 'Energy Efficiency for Engineers and Technologist', Logman Scintific & Technical, ISBN-0-582-03184, 1990.
3. Reay D.A., 'Industrial Energy Conservation', 1st edition, Pergaman Press, 1977.
4. Amit K. Tyagi, Handbook on Energy Audits and Management, TERI, 2003.
5. J.B. Gupta, Generation, transmission and utilization of electric power, Kataria Publication, New Delhi, 1986.

Sub Code:BTEE15F8403		C	L	T	P	CH
Duration: 14 Weeks	**Computer Control of Electric Drives**	**4**	**3**	**2**	**0**	**5**
Course Objectives	1. To understand the basics of mathematics applied to electrical drives. 2. Understand the basics of magnetic circuits as applicable to the electrical machines. 3. Describe the operation of induction machines in steady state that allows them to be controlled in induction-motor drives. 4. To expose the students to various types of power electronic devices and converter circuits including brief analysis and design concepts					
Course Outcomes	On completion of this course the students will be able to: 1. On completion of this course the students will be able to: 2. Understand the concepts and basic operation of electric drive system 3. Understand closed loop operation of dc, induction and synchronous machine drives 4. Understand the design techniques of drive system					

COURSE CONTENTS

Unit 1: Introduction **[10hrs]**

Solid state controlled electric drive-Concept, elements and salient features, power converter motor system, closed loop control of electric drives, sensing of speed and current, review of power converter circuits, performance parameters.

Unit 2: Control of D. C. Drives **[10hrs]**

Starting braking, transient analysis, Control of d.c. separately and series excited motor drives using controlled converters (single phase and three phase) and choppers, multi-quadrant operation of separately excited dc motor fed from fully controlled converter, static Ward- Leonard control scheme, power factor improvement, solid state electric braking scheme, closed loop control schemes.

Unit 3: Control of A. C. Motor Drives **[10hrs]**

Control of three phase induction motor drive using a.c. voltage controllers, cyclo converters. Voltage source and current source inverters; concept of field oriented control, slip power controlled slip ring induction motor drives, closed loop control schemes, self controlled synchronous motor drives, brushless dc motor drive, switched reluctance motor drive.

Unit 4: Microprocessor Control of Electric Drive [10hrs]

Functions of microprocessor in electric drive control, salient features of microprocessor control, microprocessor based control schemes for d.c. induction and synchronous motor drives, applications.

Text Books:

1. G. K. Dubey, 'Power Semiconductor controlled Drives', Narosa Publications, 1999
2. J. M. D Mruphy & I. G. Turnbull, 'Power Electronic Control of AC motors', Pergamon Press.

Reference Books:

1. B. K. Bose, 'Power Electronics and ac Drives', Peasrson, 2002
2. S. B. Dewan & G. R. Stemon & A. Straughen, 'Power semiconductor Drives', Wiley Inter Science
3. V. Subrahmanyam, 'Thyristor Control of Electric Motors', Tata McGraw Hill
4. P. C. Sen, 'Thyristor DC Drives', Wiley International
5. S. A. Nasar, 'Electric Machines and Power Systems'.

Sub Code: BTEE15F8404	**Trouble Shooting of Common Electrical Appliances**	**C**	**L**	**T**	**P**	**CH**
Duration: 14 Weeks		**4**	**3**	**1**	**0**	**5**
Course Objectives	1. To teach safety rules , important tools used in trouble shooting 2. To teach different types of wires & wire splicing, termination. 3. To teach usage of important electrical meters which are used in the process of trouble shooting. 4. To teach probable faults, causes & remedies on some common electrical equipment.					
Course Outcomes	On completion of this course the students will be able to: 1. Understand safety rules , important tools used in trouble shooting 2. Understand different types of wires & wire splicing , 3. Understand the usage of important electrical meters which are used in the process of trouble shooting. 4. Find out faults, causes and remedies for common electrical equipment.					

COURSE CONTENTS

Unit 1: Safety rules & Tools [12hrs]

Introduction , safety precautions, safety rules, screw driver , pliers, wire stripper, pocket knife, hammers, chisels, hand & Electric drill, hack saw, Rawlplug tool, neon tester, test lamp, switch board.

Unit 2: Wires, wire splicing and termination [12hrs]

Sizes of wires, stranded wires, types of wires, rubber covered, taped, braided, compounded wire, western union splice(joints)

Unit 3: Usage of meters [12hrs]

Ammeter, voltmeter, ohm meter (multi meter) megger, earth tester. Earthing.

Case Study on Megger, Earth Tester and Earthing.

Unit 4: Probable Faults, Causes, and remedies on common Electric Equipment's [12hrs]

Domestic wiring, two & 3- way control of a lamp, Fluorescence lamp set, Sodium vapor lamp, ,Mixer grinder ,Table fan and ceiling fan ,Electric iron ,3-Phase Induction motor, DOL starter for 3-Phase Induction motor. Control of Domestic motor- pump set.

Text Books:

1. S.L. Uppal, 'Electrical wiring Estimation & costing', Kanna Publications, 5th edition, reprint, 2006
2. Madhvi Gupta, 'Installation, Maintenance & Repair of Electrical Machines & Equipment', Kataria & Sons, 1st Edition, 2014.

Reference Books:

1. Philip Kiameh, 'Electrical equipment Hand book trouble shooting & maintenance', McGraw Hill, Chicago, 2003.

Mapping of Course Outcomes with Program Outcomes

Course Code	PO COs	PO 1	P0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
BTEM15F1100	CO1	3	3	2	1	1	1						
	CO2	3	3	3	1	1	1						
	CO3	3	3	2	1	1	1						
	CO4	3	3	2	1	2	1						
BTEP15F1200	CO1	3	3	1						1	1	1	1
	CO2	3	3	2						1	1	1	1
	CO3	3	3	2						1	1	1	1
	CO4	3	3	2						1	1	1	1
	CO5	3	3	2						1	1	1	1

BTCV15F1300	CO1	3	3	2	1		2	1				1	3
	CO2	3	3	3	1		1					1	2
	CO3	3	3	2	1		1	1				1	2
	CO4	3	3	1	1		2	1				1	3
BTME15F1400	CO1	3	2					2		2			
	CO2	2	1					2		2			
	CO3	2	2					2		1			
	CO4	3	1					2		2			
BTEE15F1500	CO1	1	2			1	1	1					
	CO2	1	2	1		1	1						
	CO3	1	2	1		1	1	1					
	CO4	1	2	1		1	1	1					1
	CO5	1	3	1		1	1						1
BTIC15F1600	CO1						1	2	2		2		1
	CO2						2	2	2		2		2
	CO3						2	2	3		2		2
	CO4						3	3	3		2		2
BTCE17F1700	CO1									1	3	3	3
	CO2									1	3	3	3
	CO3									1	3	3	3
	CO4									1	3	3	3
BTPL15F1800	CO1	3	3			3					3		
	CO2	3	3			3					3		
	CO3	3	3			3					3		
	CO4	3	3			3					3		

BTEC15F1900	CO1	1	1		1	1							
	CO2	1	1										
	CO3				1	1							
	CO4		1		1								
BTEM15F2100	CO1	3	3	2	1	1	1						
	CO2	3	2	3	1	1	1						
	CO3	3	2	2	3	1	1						
	CO4	3	3	2	1	1	1						
BTEC15F2200	CO1	3	3	3	2	2	1	1					1
	CO2	2	1	1	1	2	1	1				1	1
	CO3	2	3	2	1	2		1				1	1
	CO4	1		1	1	1		1				1	1
BTBE15F2300	CO1	3	1	1	1	1							1
	CO2	1	1	1	2	1							1
	CO3	2		3	2	2							
	CO4	3	1	1	1	1							1
	CO5	1		2		1					1		1
	CO6	1	1	1	2	1							1
	CO7	3	1	1	1	1							1
BTCC15F2400	CO1	3	3	3	2	2							
	CO2	3	2	3	3	3							
	CO3	3	2	3	3	3							
	CO4	3	2	2	3	3							
BTES15F2500	CO1	2		1			2	2		2			1
	CO2	3	1	2	1		3	3		3	1		2

	CO3	1					2	2		2			1
	CO4	3	1	2	2		3	3		3	1		2
	CO5	3	1	2	2		3	3		3	1		2
BTTC17F2600	CO1									1	3	3	3
	CO2									1	3	3	3
	CO3									1	3	3	3
	CO4									1	3	2	2
BTED15F2700	CO1	3	2	2	1	3							
	CO2	3	1	1	1	3							
	CO3	3	3	3	2	3							
	CO4	2	2	2	2	3							
BTCL15F2800	CO1	1	1	1	1		2						1
	CO2	1		1			2	2					1
	CO3	1	1				2	2					1
BTCP15F2900	CO1	3	2	3	2	2							
	CO2	2	1	2	2	2							
	CO3	2	3	3	3	2							
	CO4	3	2	3	2	1							
BTEE15F3100	CO1	3	3	2	1	1	1						
	CO2	3	2	3	2	1	1						
	CO3	3	3	2	1	1	1						
BTEE15F3200	CO1	3	2	1		2							
	CO2	3	3	1		1							
	CO3	1	1	1	1								
	CO4	1	2	3		1							

BTEE15F3300	CO1	1				1	1		1				
	CO2	1	1			1							
	CO3	1	1										
	CO4	1	1										
BTEE15F3400	CO1	3	3	3			1	2	1	2	3		
	CO2	3	3				1						1
	CO3	3	2	1		1			1		2		
	CO4	3				2	1	1		2			
BTEE15F3500	CO1	3	2	1	1	1	1	1					
	CO2	3	3	3	2	2							
	CO3	3	2	3	2	2							1
	CO4	3	1	1	1	3	1						
	CO5	3	3	3	2	2							
BTEE15F3600	CO1	1	3			1	1	1					
	CO2	1	2	2		2	1						
	CO3	1	3	1		1	1	1					
	CO4	1	2	1		1	1	1	1				1
	CO5	1	2	1		1	1	1					
BTEE15F3700	CO1	1		2	1	2					1		
	CO2	2		2	2	1							2
	CO3	1	1	1	1	1							
	CO4	1	1	1	1	1							1
	CO5	1	1	2	2	1							2
	CO6		1	1	1								
	CO7									1	2		

BTEE15F3800	CO1	1	3			1	1	1					
	CO2	1	2	1		1	1						
	CO3	1	3	1		1	1	1					
	CO4	1	2	1		1	1	1					1
	CO5	1	2	1		1	1						
	CO6	1	2	1		1	1						
	CO7	1	3	1		1	1	1					
	CO8	1	2	2		1	1	1					
BTEE15F4100	CO1	3	2	2	1	1	1						
	CO2	3	3	2	2	1	1						
	CO3	3	3	1	1	1	1						
	CO4	3	3	2	1	2	1						
BTEE15F4200	CO1	2	3		1								
	CO2	3	3		1								
	CO3	2	2										
BTEE15F4300	CO1	2	2		3								
	CO2	2	3		2								
	CO3	1	2	2	2								
	CO4	2	2		2								
BTEE15F4400	CO1	3	1	1	1	1							
	CO2	2	1	1	1	1							
	CO3	1	2	1	1	1							
	CO4	1	2	2	2	1							
BTEE15F4500	CO1	3	1	2									
	CO2	3	1	2	1	2							

	CO3	3		3	1	1							2
	CO4	2		3		2							
BTEE15F4600	CO1	2	3	2	2	2	1						
	CO2	2	2	2	2	2	1						
	CO3	2	2	2	2	2	1	1			2		
	CO4	2	1	2	1	1		2					
BTEE15F4700	CO1	1	1										
	CO2		1			2							
	CO3			1		2							
	CO4	1		1		2							
BTEE15F4800	CO1	2	1	3	1	2							
	CO2	1	3	2	2	1							
	CO3	2	2	2	2	1					2		
	CO4	3	3	3	1	1							
BTEE15F5100	CO1	1	1		1								
	CO2	1	1										
	CO3	1			1								
	CO4	1	1										
BTEE15F5200	CO1	3	1					2	3				
	CO2	1	1					2	1				
	CO3	1	2					1	2				
	CO4	2	3					2	2				
	CO5	1	1					2	1				
BTEE15F5300	CO1	2	3	1									
	CO2	3	2		1								

	CO3	2	3	1	1								
	CO4	2	3	1	1	2							
	CO5	2	3	1	1	2							
BTEE15F5400	CO1	3			1								
	CO2	1	2		3	1							
	CO3	3		1	2								
	CO4	1		3	2								
BTEE15F5501	CO1	2	2	1	2	1							
	CO2	2	2	2	2	2	1						
BTEE15F5502	CO1	3	2	2	3	1							
	CO2	2	2	2	3								
	CO3	1	2	2	2	1							2
	CO4	2	2	1	2	1							
BTEE15F5503	CO1	2											
	CO2			1									
	CO3		1	1	1								
	CO4							1					
BTEE15F5504	CO1	3	1						1	3	3	2	2
	CO2	3	3	3	3		3		1	3	3	2	3
	CO3	3	3	2	2	3	2						
	CO4	2	3	1	2	2	1						
BTEE15F5601	CO1	3	2	3	1								
	CO2	3	2	3	1								
BTEE15F5602	CO1	3	3	2	2	1	1						
	CO2	2	2	2	2	2	1						

	CO3	2	2	2	2	2							
	CO4	2	1	1	1	1							
	CO5	1	2	1	2								
BTEE15F5603	CO1	3	2		1	2							
	CO2	2	1		2								
	CO3		2		3	3							
BTEE15F5604	CO1			2	1	3	1	2	1	2		2	3
	CO2				2	3	2	3		1			3
	CO3	1		1		3	1	2		3		2	3
	CO4			1		3		3					3
	CO5					2		2				3	3
BTEE15F5700	CO1	1	1										
	CO2	1		1						1			
	CO3		1		1	1							
	CO4		1		1							1	
BTEE15F5800	CO1	2	1	2		3							
	CO2	2	1	2	1	3							
BTEE15F6100	CO1	1	1		1								
	CO2			1									
	CO3	1			1								
BTEE15F6200	CO1	1		1			1						
	CO2	1		1			1			1			
	CO3		1			1					1		
	CO4		1		1				1			1	
BTEE15F6300	CO1	2	2	2	1								

	CO2	3	3	3	3	1							
	CO3	3	2	2	1	2							
BTEE15F6401	CO1	1			1	1							
	CO2	1		1									
	CO3	1		1	1								
	CO4	1											
BTEE15F6402	CO1	1	3			1	1	1					
	CO1	1	2	2		2	1						
	CO3	1	3	1		1	1	1					
	CO4	1	2	1	1	1	1	1	1				
	CO5	1	2	1		1	1	1	1				1
BTEE15F6403	CO1			3	3	2							
	CO2			3	3	2							
	CO3				3	2						1	
	CO4							2	1				
	CO5	1			2								1
BTEE15F6404	CO1	2	3	3									
	CO2	3	3	2	2	3							
	CO3	3		3	2	3							
	CO4	3		2	3	3	2				3	2	
BTEE15F6501	CO1	1			1								
	CO2		1			1				1			
	CO3		1			1			1				
	CO4	1	1						1			1	
BTEE15F6502	CO1	2	1		1	1							

	CO2	1	3		1	2							
	CO3	2	1		1	1							
	CO4	3	2		1	1							
BTEE15F6503	CO1	1	1					2					
	CO2	1	2					2					
	CO3	1	2	1									
BTEE15F6504	CO1												3
	CO2												3
	CO3											2	3
	CO4											3	3
BTEE15F6601	CO1	1	1	1	1	1	1						
	CO2	1	1	1	1	1	1						
	CO3	2	1	1	1	1							
	CO4	1	1	1	1	1	1	1					
	CO5	1	1	1	1	1							
	CO6	1	1	1	1	1	1	1					
BTEE15F6602	CO1	1	2	3	1								
	CO2	2	3	1	2	1							
	CO3	2	3	1	2	1							
	CO4	1	2	3	3	3							
BTEE15F6603	CO1							1					
	CO2						1		1				
	CO3	2											
	CO4			1				1					
BTEE15F6604	CO1	1	1		3	3		1					2

	CO2	1	1		3	4							2
	CO3	1	1		4	4		1					3
	CO4	1	1		4	4		1					4
BTEE15F6700	CO1	1					1						
	CO2	1	1			1				1			
	CO3		1			1			1				
	CO4	1	1									1	
BTEE15F6800	CO1	3	1	-	2	2	2	-	-	1	1	1	2
	CO2	3	2	-	2	2	1	-	-	1	-	1	2
	CO3	2	3	2	2	1	2	1	1	1	1	1	2
	CO4												
BTEE15F7100	CO1	1	1										
	CO2	1		1									
	CO3		1		1	1							
	CO4		1		1								
BTEE15F7200	CO1	2	2	3	2	2							2
	CO2	3	3	3	2	2							1
	CO3	1	3	2	3	2							2
	CO4	3	3	2	2	3							2
BTEE15F7300	CO1	1	3	2	2	1							
	CO2	2	2	2	2	1				1	2		
	CO3	2	1	3	1	2	1						

	CO4	2	1	2	2	1						1	
	CO5	2	1	1	2						2	2	2
	CO6	1						1	2				
	CO7	2	2	2	2	2			2	2	2	2	3
BTEE15F7401	CO1	1			1		1						
	CO2		1	1				1					
	CO3	1			1	1					1		
	CO4				1			1				1	
BTEE15F7402	CO1		1		1								
	CO2		1										
	CO3				1								
	CO4		1			1							
BTEE15F7403	CO1	2	2	2	2	2		1					
	CO2	2	1	2	1	1							
	CO3	2	1	2	1	1							
	CO4	2	1	2	1	1				1	2		
BTEE15F7404	CO1	1	2	1	1	2	1						
	CO2	2	1	1	2	2	1						
	CO3	1	2	1	1	3	1						
	CO4	2	1	2	3	3	1						
BTEE15F7501	CO1	1	2	1			1	1					
	CO2	2	3	2									
	CO3	3	2	2	1								
	CO4	2	3	1	1								
BTEE15F7502	CO1	2	3	3	3	1							

	CO2	2	3	2	2	1							
	CO3	2	3	2	2	1							
	CO4	2	3	2	2	1							
BTEE15F7503	CO1	3	3	3			1	2	1	2	3		
	CO2	3	3	2			1						1
	CO3	3	2	1	2	1			1		2		
	CO4	3				1	1	1		2			
	CO5	3					1		2	3			
BTEE15F7504	CO1	3											
	CO2		3										
	CO3	2		2									
	CO4	1	1		3								
BTEE15F7700	CO1	3	3	2	3								
	CO2	3	3	3	3		2						
BTEE15F7800	CO1		1	2	2	3							
	CO2		1	2	2	3							
BTEE15F8100	CO1	3	3	2	2	3				1			
	CO2	2	2	2	2	1				1	2		
	CO3	2	1	2	2	1						1	
	CO4	2	1	1	2						2	2	2
	CO5	2	2	2	2	2			2	2	2	2	3
BTEE15F8201	CO1	3	3	1									
	CO2	2	3	3		2							
	CO3	3	2	2									
	CO4	2	3	1		3	2						

BTEE15F8202	CO1	3	3	1			1	1					
	CO2	2	3	2									
	CO3	3	2	2	1								
	CO4	2	3	1	1								
BTEE15F8203	CO1	2	3	3	2	1	2						
	CO2	2	3	3	2	1							
	CO3	2	2	2	2	1							
	CO4	2	2	2	2	1							
BTEE15F8204	CO1	2	1		3								
	CO2				2	2	1						
	CO3	3	1	2									
	CO4	1	1		2								
	CO5	1	2		1								
	CO6		1		2	3							
	CO7		1		2	3							
BTEE15F8301	CO1	2	2	3				1					
	CO2	2	2	2		1							
	CO3	2	2	2		1		1					
	CO4	2	2	2		1		1					
BTEE15F8302	CO1	1	1				1						
	CO2		1		1	1				1			
	CO3		1			1			1			1	
	CO4			1		1		1			1		
BTEE15F8303	CO1	2	2	3	2	2	2	1					
	CO2	2	2	2	2	1	2	1					

	CO3	1	2	3	2	1	1	1					
	CO4	1	2	3	2	1	2	1					
	CO5	1	2	3	2	1	2	1					
BTEE15F8401	CO1		2	3	1	3	3	2	2	2	2	2	1
	CO2		2	3		2	2	2	2	2	2	2	1
	CO3		2	3		2	2	2	2	2	2	2	1
	CO4		2	3		2	2	2	2	2	2	2	1
BTEE15F8402	CO1	3	2	2				3		2		2	1
	CO2	2	1	3				3		2		2	1
	CO3	2	2	3				3		1		2	2
	CO4	3	1	3				3		2		2	1
	CO5	2	1	2				2		1		1	2
BTEE15F8403	CO1	2	2	1	2	1							
	CO2	2	2	2	2	2	1						
	CO3	1	2	1	2	1	1						
	CO4	1	2	1	2	1							
BTEE15F8404	CO1	1	2	3	2	2	3	3	1				
	CO2	2	2	2	2	1	1						
	CO3	1	2	2	2	1	2				2		
	CO4	1	2	2	1	1	1						

Mapping of PEOS with Respect to POs & PSOs

	PO1	P2	PO3	PO4	PO5	PO6	P7	PO8	PO9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3	

PEO1	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
PEO2	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
PEO3	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
PEO4	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

FACULTY MEMBERS PROFILE

Dr. Rajashekhar P. Mandi, Ph.D

Professor & Director, School of Electrical & Electronics Engineering

Dr. Rajashekar P. Mandi, Director, School of Electrical and Electronics Engineering, REVA University, holds Doctorate from NITK, Surathkal in the area of "Power and Energy" and holds M. Tech. degree with 3rd Rank in "Energy Systems Engineering" from BV Bhoomaraddi College of Engineering & Technology, Hubli of Visveswaraiah Technology University (VTU), Belgaum. He has one year of teaching experience. Prior to venturing into the field of academia, he has worked in Central Power Research Institute (CPRI) for 26 years in the area of Energy conservation, Energy audit, Power quality, Power system and Renewable energy systems. His teaching experience includes, teaching subjects like – Power quality, Facts controller, Electric Vehicle, Energy management, Renewable energy systems, etc., at the post-graduate level and PhD research scholars, and Electric power utilization, Electric machines, etc., at the undergraduate level. His area of interest is Energy conservation, Power quality, Power system and Renewable energy system. He is a professional member of IEEE. He is accredited energy auditor from Bureau of Energy Efficiency (BEE), Govt. of India. He is presently chairman of Society for Energy Efficiency & Manager (SEEM) Karnataka Chapter. He was member of several BIS committee in the area of electric lamps, electrical fans, solar PV, Batteries, electrical appliances, etc. He was also member of fixing ofstar label for LED lamps and electrical appliances for Bureau of Energy Efficiency, Govt. of India. He worked as nodal officer in Accelerated Power Development & Reforms Programme (APDRP). His research interests include renewable energy systems, energy conservation, strengthening of electrical distribution systems, electrical safety, power quality, LED lighting systems, etc. Presently he is guiding 5 PhD research scholars, guided 10 MTech. Projects and 15 BTech. Projects. He had written 3 book chapters on energy conservation in Thermal Powerplants and 2 book chapters in distributed power generation. He had published more than 117 technical papers in International & Indian Journals, Conferences & Seminars in the field of energy conservation, power quality, LED lighting system and renewable energy systems.

Dr. B.P. Divakar
Professor& Dean, Research & Innovation Council REVA University

Dr. B.P. Divakar completed B.E in Electrical and M.E. in power system in 1988 and 1992 respectively. He completed his Ph.D from theHong Kong polytechnic University in 1998 in power electronics. From 1998 - 2009 he served as research associate, research fellow, Lecturerat the Electrical Department of the same university. He has two US patents and won a meritorious award for a team project from the University. He joined RITM in

2009 as senior professor and became dean of Research of RU in 2013. He has 7 Journalpublications including 4 IEEE journals and over 40 international conferences. He is a recipient ofBest Teacher award from RU for his teaching contributions. His teaching experience includes, teaching subjects like Switched mode power conversion, Power Electronics applications using ICs, Power Supply systems, power Electronics applications in power system at the post-graduate level Networks Analysis, Engg Economics and Management, Electrical Machines, High Voltage Engg, Power system operation and control at the under-graduate level. He is guiding 6 research scholars in wide range of topics such as Multilevel inverter, Battery management system, Power factor controlling technique, rapid prototyping, Sensor less speed control, ultra-capacitor applications in electric vehicle, integrated charging technique for EVs and contingency analysis for power evacuation. He is the chair of REVA innovation club which is established to encourage multidisciplinary projects mentored by faculty across disciplines.

Prof. K. Narayana Swamy, M.Tech. (Ph.D)
Senior Associate professor

Prof. K. Narayana Swamy, Senior Associate professor, School of Electrical and Electronics Engineering., REVA University, holds M.E. degree in "Power Systems" from UVCE, Bangalore University and B.E. in "Electrical Power" from SJCE, Mysore University. He has 27 years of teaching experience. His teaching experience includes, teaching subjects like Switched Mode Power Conversion, Multilevel Inverters at the post- graduate level and Basic Electrical Engineering, Network Analysis, Electrical and Electronics Measurements, Electrical Machines, Control Systems, Power Electronics, Switch Gear and Protection, Electrical Machine Design, Electrical Power Utilization at the undergraduate level. His area of interest is DC-DC Converters and Multilevel Inverters.

Prof. Nagesh B.K., M.Tech. (Ph.D)
Associate Professor

Prof. Nagesh B.K. Associate Professor, School of Electrical and Electronics Engineering, REVA University, holds M.E. from Bangalore University, in Power Electronics from UVCE, Bangalore & pursuing Ph.D at VTU . He has 17 years of teaching experience. His teaching experience includes, teaching subjects like, Power Electronics, DC Machines & Synchronous Machines, Control engineering etc., at the undergraduate level. His area of interest is Power Electronics.

Prof. G S Mahesh, M.Tech. (Ph.D)
Associate Professor

Prof. G S Mahesh, Associate Professor, School of Electrical and Electronics Engineering, REVA University, holds M E in Applied Electronics, Madras University, and graduate degree in "EEE Stream" from MSRIT, Bangalore. He has 13 years of teaching experience. His teaching experience includes, teaching subjects like - Basic Electrical Engineering, Linear Integrated Circuits and Applications, Microcontrollers, Industrial Drives and Applications, Electrical Power Quality, Analog Electronics at the undergraduate level. His area of interest is Power Quality and Control Systems and currently perusing PhD in VTU.

Prof. Gopinath A, M.Tech. (Ph.D)
Associate Professor

Prof. Gopinath A, Associate Professor, School of Electrical and Electronics Engineering, REVA University, M. E. degree in Power & Energy System Engineering from UVCE, Bangalore and B E. degree in Electrical Engineering from BMSCE, Bangalore . He has 13 years of teaching experience. His teaching experience includes, teaching subjects like Computer Techniques in Power System Analysis, Power System Analysis & Stability, Modern Control Theory, HVDC Transmission at the graduate level. His area of interest is Plug-in Hybrid Electric Vehicles (PHEV) at the undergraduate level. He is pursuing PhD in Power Electronics at VTU, Belagavi.

Prof. Sudharani Potturi, MTech.
Senior Assistant Professor

Prof. Sudharani Potturi, Senior Assistant Professor, School of Electrical and Electronics Engineering, REVA University, M. Tech degree in Power Electronics & Industrial drives from JNTU, Hyderabad and B E. degree in Electrical & Electronics Engineering from JNTU, Hyderabad. She has 13 years of teaching experience. Her teaching experience includes, teaching subjects like Electrical Machines, Network Analysis, Electrical Power Generation, Electrical Power Utilization, High Voltage, Switchgear & Protection under UG and Power Semiconductor Devices, AC-DC Drives under PG.

Prof. G. Raghavendra, MTech. (Ph.D)
Assistant Professor

Prof. G. Raghavendra, Asst. Professor in the school of Electrical and Electronics Engineering holds B.E in Electrical and Electronics Engineering from Dr.TTIT, K.G.F and M.Tech in Digital Electronics from SSIT, Tumkur. He has 13 years of teaching experience, teaching various subjects like Network Analysis, Control systems, Modern control Theory, Electrical Drawing and Basic Electrical Engineering. His area of interest is in power systems currently pursuing PhD in Jain University.

Prof. Gangadharappa T. M., ME (Ph.D)
Assistant Professor

Prof. Gangadharappa T. M, Assistant Professor, School of Electrical and Electronics Engineering, REVA University, M. E. degree in Electronics & Communication from UVCE, Bangalore and B E. degree in Electronics & Communication Engineering from MS RAMAIAH, Bangalore . He is pursuing PhD in Embedded Systems under RU. He has 16.6 years of teaching experience. His teaching experience includes, teaching subjects like Basic Electrical & Electronics, Analog Electronic Circuits, Logic Design, Linear Integrated Circuits, Digital Signal Processing, Signals & Systems, Field Theory, VLSI, Control System, Embedded Systems under UG and Advanced Power Electronics under PG. His area of research interest is Embedded Systems.

Prof. Ashwini Kumari P., ME (Ph.D)
Asstt. Professsor

Prof. Ashwini Kumari P., Asstt. Professor, School of Electrical and Electronics Engineering, REVA University, holds M E degree in Power and Energy Systems from UVCE Bangalore and B E degree in Electrical and Electronics Engineering from Visvesvaraya Technological University Bangalore. She is pursuing PhD in Power Energy Systems under VIT, Vellore. She has 6 years of teaching experience. Her teaching experience includes, teaching subjects like -DC & Synchronous Machines, Control Systems, Advanced Control Systems, and Electrical power Generation and Distribution, Testing and Commissioning of Electrical Machines, Electrical Power utilization, Transformer and Induction Machines, and Elements of Electrical and Electronics Engineering at the undergraduate level. Her area of interest is Renewable Energy Systems.

Prof. Himabindu N, MTech (Ph.D.)
Assistant Professor

Prof. Himabindu N, Assistant Professor, School of Electrical and Electronics Engineering, REVA University, holds M.Tech degree in "VLSI Design and Embedded Systems" from RITM, Bangalore and B.Tech degree in "Electrical And Electronics Engineering" from SKIT, JNTU, Hyderabad. She is pursuing PhD in Renewable Energy Systems under RU. She has 3 years of teaching experience. Prior to venturing into the field of academia, she has experience of working in the experience Industry. Her teaching includes, teaching subjects like Embedded Systems at the post-graduate level and VLSI, EPG, HV, SGP, RES at the undergraduate level. Her area of interest is Power Systems and Renewable Energy.

Prof. Viswanatha .V, ME, (Ph.D)
Assistant Professor

Prof. Viswanatha V, Asst. Professor, School of Electrical andElectronics Engineering., REVA University, holds ME degree in Power Electronics" from UVCE, Bangalore and Be degree in"Electronics and Communications" from Alpha College of Engineering, VTU, Belgaum. He has 6 year of teaching experience, pursuing Ph.D in Electronics at VTU, Belagaum. His teaching experience includes, teaching subjects like –Modeling and Simulation of Power Electronics, Real st-graduate level, and Digital Signal Processing, Signal and Systems, Microcontrollers, Power Electronics, Embedded System Design, Wireless communication at the undergraduate level. His area of interest is DSP Based Embedded Controllers design for Power Electronic Applications.

Prof. V. Christina Sundari, M.Tech.
Assistant Professor

Prof. V. Christina Sundari, Assistant Professor, School of Electrical Sciences, holds M. Tech. degree in "Power Electronics" and B. E. degree in" Electrical and Electronics Engineering" from VTU. She has over 5 years of teaching experience, teaching various subjects like Logic Design, Transformer and Induction Machines, Electrical Machine Drawing, Management and Entrepreneurship, Elements of Electrical and Electronics Engineering. She is interested in pursuing research in Industrial Drives.

Prof. Deepa K R, MTech.
Assistant professor

Prof. Deepa K R, Assistant professor, School of Electrical and Electronics Engineering, REVA University, holds M.Tech degree in "Computer application in industrial drives" from Sri Siddhartha Institute of technology , Tumkur and B.E degree in "Electrical and Electronics Engineering" from Sri Siddhartha Institute of technology, Tumkur, VTU, Belgam. She has 5.5 year of teaching experience. Her teaching experience includes, teaching subjects like –Electromagnetic compatibility at the post-graduate level, and Basic Electrical Engineering, Analog electronics, Control systems, Modern control theory, Operation research, Electrical drawing, electrical power utilization, Power system optimization and control, at the undergraduate level. Her area of interest is Power electronics.

Prof. K Nethra, MTech.
Assistant Professor

Prof. K Nethra, Assistant Professor, School of Electrical and Electronics Engg., REVA University, holds M.Tech degree in "Power Electronics " from REVA ITM and B.Tech degree in "Electrical and Electronics Engineering" from REVA ITM, under VTU, Bangalore. She has 5 years of teaching experience. Her teaching experience includes, teaching subjects like Computer Aided Electrical Drawing, Electrical and Electronics Measurement and Instrumentation, Transmission and Distribution, Basic Electrical Engineering at the undergraduate level. Her area of interest is Electrical Drawing.

Prof. Seema Magadum, MTech.
Assistant professor

Prof. Seema Magadum, Assistant professor, School of Electrical and Electronics Engineering, REVA University, holds M.Tech degree in "Power & Energy Systems", from NITK Surathkal and B.E degree in "Electrical and Electronics Engineering" from BEC Bagalkot. She has 5 years of teaching experience. Her teaching experience includes, teaching subjects like – Network analysis, Power System Planning, Electrical distribution systems, Basic Electrical Engineering, Operation research, CTPS at the undergraduate level and Power Electronics & Smart Grid, HVDC at PG level. Her area of interest is Smart Grid & Power Quality.

Prof. Arpita Banik, M.Tech.
Assistant Professor

Prof. Arpita Banik, Asst. Professor in the School of Electrical and Electronics Engineering holds B. Tech. in Electrical Engineering and M. Tech. in Power Electronics and Drives from NIT, Agartala, Triupra. Prof. Arpita Banik has 6 years of teaching experience. Her area of specialization is Power Electronics and Drives and her area of interest is AC-DC Convertor. She has taught various subjects at undergraduate level viz. Basic Electrical, Field Theory, Circuit Theory, Linear Control System, Power Electronics and Electrical Machines.

Prof. Rajini H., MTech (Ph.D)
Asst. Professor

Prof. Rajini H, Asst. Professor in the school of Electrical and Electronics Engineering holds B.E in Electrical and Electronics Engineering from SKIT, Bangalore and M.Tech in Power Systems from NIE, Mysore. She has 5 years of teaching experience, teaching various subjects like Power system Analysis & Stability, Computer techniques in Power system, Power System Operation & Control, Control Systems and Basic Electrical Engineering. Her area of interest is in power systems and High Voltage Engineering and currently pursuing PhD in VTU.

Prof. Saahithi S., MTech
Assistant Professor

Prof. Saahithi S, Assistant Professor, School of Electrical and Electronics Engineering, REVA University, holds M.Tech degree in "Computer Applications in Industrial Drives" from MSRIT, Bangalore and B.Tech degree in "Electrical And Electronics Engineering" from Aurora's Engineering College, JNTUH, Hyderabad. She has 3 years of teaching experience. Prior to venturing into the field of academia, she has experience of working in the Research field. Her teaching experience includes, teaching subjects like – AC/DC Drives at the post-graduate level, and Electrical circuits and machines, Basic Electrical Engineering, Electrical Measurements and Instrumentation at the undergraduate level. Her area of interest is Power Electronics and Drives.

Prof. Sujo Oommen, MTech
Assistant Professor

Prof. Sujo Oommen, Assistant Professor, School of Electrical and Electronics Engg., REVA University, holds M.Tech degree in "Power Electronics and Drives" from Karunya University and B.Tech degree in "Electrical and Electronics Engineering" from St. Joseph College of Engineering and Technology, Palai, Kerala under M G University. She has

4 years of teaching experience. Her teaching experience includes, teaching subjects like Power Electronics, Signals and Systems, Basic Electrical Engineering, Electric Power Generation, Electrical Machines and others at the undergraduate level. Her area of interest is Power Electronics.

Prof. Mahesh Kumar, M.Tech.
Assistant Professor

Prof. Mahesh Kumar, Assistant Professor, School of Electrical and Electronics Engg. REVA University, holds M.Tech degree in "Power Electronics Stream Electrical and Electronics Engineering" in 2015 from REVA Institute of Technology& Management, B.E degree in "Electrical and Electronics Engg." from REVA Institute of Technology& Management in 2012 from, Visveshwaraya Technological University Belagavi and has Diploma in Electrical and Electronics Engineering in 2009. He has 4 years of teaching experience. His teaching experience includes, teaching subjects like – Electrical Power Utilization, Basic Electrical Engg, Electrical Power Generation, Logic Design, Computer Aided Electrical Drawing, at the undergraduate level. His area of interest is Power Electronics Multilevel Inverters and DC to DC converters.

Prof. N. Mamatha, M.Tech.
Assistant professor

Ms. N. Mamatha, Asst. Professor in the School of Electrical and Electronics Engineering holds B.E. in Electrical & Electronics Engineering from Siddaganga Institute of Technology, Tumkur and M. Tech. in Power Electronics from REVA Institute of Technology & Management (RITM), Bangalore. Prof. Mamatha N has more than 2 years of teaching experience. She has also worked in KPTCL as a Graduate Trainee for one year. Her area of specialization is Power Electronics. Her area of interest is Inverters, Solar Generators, She has taught various subjects at undergraduate level viz., Power Electronics, Microprocessor 8051, Electrical Power Generation and basic electrical engineering. She has submitted a project on "Design of Transformers and Inverter for 3 MW grid converted Solar PV plant at Kolar, carried out under KPCL. She has attended a National Conference on "Performance Analysis of 3 KW grid converted solar PV plant at Kolar and National Conference on "Fuzzy Logic based MPPT method for solar converter".

Prof. Ramya N., MTech.
Assistant Professor

Prof. Ramya N, Assistant Professor, School of Electrical and Electronics Engg., REVA University, holds M.Tech degree in "Computer Applications in Industrial drives" from MSRIT, Bangalore and B.E degree in "Electrical and Electronics Engineering" from VVCE, Mysore. She has 3 years of teaching experience and 2 years of industry. Her teaching experience includes, teaching subjects like

EMD, IDA, Basic Electrical Engineering at the undergraduate level. Her area of interest is High Voltage Engg. and Insulation systems.

Prof. Divya K S., MTech
Assistant Professor

Prof. Divya K S, Assistant Professor, School of Electrical and Electronics Engg., REVA University, holds MTech degree in "Power systems and Power electronics" from IIT Madras and BTech degree in "Electrical Engineering" from MANIT Bhopal. She has 2 years of teaching experience. Prior to venturing into the field of academia, she has experience of working in flight simulation field. Her teaching experience includes, teaching subjects like –Modeling and Simulation of Power Electronic Systems, DC-DC Converters, Power electronics design using IC's, Control of Drives at the post-graduate level, and Advanced Power Electronics at the undergraduate level. Her areas of interest are Power Systems Modeling, Power electronics and Control Systems.

PROF. Divya B V., MTech
Asst. Professor

Prof. Divya .B.V, Asst. Professor in School of Electrical Engineering holds M.Tech degree in 'Power Electronics' from Visvesvaraya University, B.E degree in 'Electrical and Electronics Engineering' from Visvesvaraya Technological University. Prof. Divya. B.V has 2.5 years of teaching experience. Her area of interest is FACTS Controllers. She has taught subjects in Undergraduate level viz. Transformers and Induction Machines, Electrical Power Generation, Modern Control Theory, Electrical Machine Design, DC Machines and Synchronous Machines and Power Electronics etc. In Postgraduate level, she has taught Power Semiconductor Devices. She has attended 3 workshops on various subjects

Prof. Lavanya Neerugattu, MTech
Assistant Professor

Prof. Lavanya Neerugattu, Assistant Professor, School of Electrical and Electronics Engg. REVA University, holds M.Tech degree in "Power Electronics, Stream Electrical and Electronics Engineering" in 2012 from VNR Vignana Jyothi Institute of Engineering & Technology, BTech degree in "Electrical and Electronics Engg." from Madanapalle Institute of Technology& Sciences in 2010 from, JNTU Anantapur. She has 3 years of teaching experience. Her teaching experience includes, teaching subjects like – Electrical Measurements and Instrumentation, Basic Electrical Engg, Electrical Wiring, at the undergraduate level. His area of interest is Power system voltagestability.

Prof. Latha N., MTech.
Assistant Professor

Prof. Latha. N, Asst. Professor in School of Electrical Engineering holds M.Tech degree in Power Electronics from Visvesvaraya University**,** B.E degree in Electrical & Electronics Engg. from Visvesvaraya Technological University. Prof. Latha. N, has 2.5 years of teaching experience. She has taught subjects in Undergraduate level viz. Basic Electrical Engineering, Electrical Power Generation, Renewable Energy Sources and Electrical and Electronic Measurements and Instrumentation etc. In Postgraduate level, she has taught Power Semiconductor Devices, Application of ICs in design of Power electronic Circuits. She has attended 3 workshops on various subjects. Her area of interest is Multilevel Inverter.

Prof. Sagar B S., MTech
Assistant Professor

Prof. Sagar B S, Assistant Professor, School of Electrical and Electronics Engineering., REVA University, holds M. Tech degree in "Power Electronics" from RITM and B.E degree in "Electronics and Communication Engineering" from RGIT, VTU, Bangalore. He has two years of teaching experience and also has experience as Research Assistant for 8 months. His teaching experience includes, teaching subjects like Analog Electronics Circuits, Microcontrollers, Linear Integrated Circuits, Basic Electrical Engineering at the undergraduate level. His areas of interest are Battery Management System and digital control.

Prof. Doddabasappa N., MTech
Assistant Professor

Prof. Doddabasappa N, Assistant Professor, School of Electrical and Electronics Engg. REVA University, holds M.Tech degree in "Computer Applications in Industrial Drives" in 2015 from MS Ramaiah Institute of Technology , B.E degree in "Electrical and Electronics Engg." from HMS Institute of Technology in 2011 from, Visveshwaraya Technological University Belagavi. His area of interest is Power Electronics Inverters and Dual Buck Inverters

Prof. Santhosh G., MTech
Assistant Professor

Prof. Santhosh G, Assistant Professor in the school of Electrical and Electronics Engineering holds B.E in Electrical and Electronics Engineering from M S Engineering College, Bangalore and M-Tech in Computer Application in Industrial Drives from The Oxford College of Engineering, Bangalore. His area of interest is in Electrical Drawing, Power Electronics and Drives.

DO'S AND DON'TS

DO'S

1. Maintain discipline and respect the rules and regulations of the university
2. Be regular and punctual to classes
3. Study regularly and submit assignments on time
4. Be respectful to your Teaches/friends and hostel staff/management.
5. Read the notice board (both at your college and the hostel) regularly.
6. Utilize your Personal Computer for educational purpose only.
7. Follow the code of conduct.
8. Visit Health Center on the campus whenever you are unwell.
9. Be security conscious and take care of your valuables especially Cash, Mobile Phones, Laptop and other valuables.
10. Carry your valuables along with you whenever you proceed on leave/vacation.
11. Use electric appliances, lights and water optimally.
12. Keep the campus clean and hygienic.
13. Use decent dressing.

DON'TS

1. Ragging inside / outside the campus.
2. Possession of Fire arms and daggers etc.
3. Use of Alcohols, Toxic drugs, sheesha, gutkha and hashish/heroin etc.
4. Use of Crackers, explosives and ammunition etc.
5. Smoking and keeping any kind of such items.
6. Misusing college & hostel premises/facilities for activities other than studies.
7. Playing loud music in the room which may disturb studies of colleagues / neighbors.
8. Making noise and raising slogans.
9. Keeping electrical appliances, other than authorized ones.
10. Involvement in politics, ethnic, sectarian and other undesirable activities.
11. Proxy in any manner.
12. Use of mobiles in the academic areas.

Note: 1. Rules are revised / reviewed as and when required.
2. Healthy suggestions are welcome for betterment of Institution

REVA UNIVERSITY
Bengaluru, India

SCHOOL OF CIVIL ENGINEERING

B.Tech. in Civil Engineering

HANDBOOK

2015 - 19

Rukmini Knowledge Park,
Kattigenahalli, Yelahanka, Bangalore - 560 064
Phone No: +91-080-46966966

Rukmini Educational
Charitable Trust

www.reva.edu.in

Chancellor's Message

"Education is the most powerful weapon which you can use to change the world."
- Nelson Mandela.

There was a time when survival depended on just the realization of physiological needs. We are indeed privileged to exist in a time when 'intellectual gratification' has become indispensable. Information is easily attainable for the soul that is curious enough to go look for it. Technological boons enable information availability anywhere anytime. The difference, however, lies between those who look for information and those who look for knowledge.

It is deemed virtuous to serve seekers of knowledge and as educators it is in the ethos at REVA University to empower every learner who chooses to enter our portals. Driven by our founding philosophy of 'Knowledge is power', we believe in building a community of perpetual learners by enabling them to look beyond their abilities and achieve what they assumed impossible.

India has always been beheld as a brewing pot of unbelievable talent, acute intellect and immense potential. All it takes to turn those qualities into power is a spark of opportunity. Being at a University is an exciting and rewarding experience with opportunities to nurture abilities, challenge cognizance and gain competence.

For any University, the structure of excellence lies in the transitional abilities of its faculty and its facility. I'm always in awe of the efforts that our academic board puts in to develop the team of subject matter experts at REVA. My faculty colleagues understand our core vision of empowering our future generation to be ethically, morally and intellectually elite. They practice the art of teaching with a student-centered and transformational approach. The excellent infrastructure at the University, both educational and extra-curricular, magnificently demonstrates the importance of ambience in facilitating focused learning for our students.

A famous British politician and author from the 19th century - Benjamin Disraeli, once said 'A University should be a place of light, of liberty and of learning'. Centuries later this dictum still inspires me and I believe, it takes team-work to build successful institutions. I welcome you to REVA University to join hands in laying the foundation of your future with values, wisdom and knowledge.

Dr. P. Shyama Raju
The Founder and Hon'ble Chancellor,
REVA University

Vice-Chancellor's Message

The last two decades have seen a remarkable growth in higher education in India and across the globe. The move towards inter-disciplinary studies and interactive learning have opened up several options as well as created multiple challenges. India is at a juncture where a huge population of young crowd is opting for higher education. With the tremendous growth of privatization of education in India, the major focus is on creating a platform for quality in knowledge enhancement and bridging the gap between academia and industry.

A strong believer and practitioner of the dictum "Knowledge is Power", REVA University has been on the path of delivering quality education by developing the young human resources on the foundation of ethical and moral values, while boosting their leadership qualities, research culture and innovative skills. Built on a sprawling 45 acres of green campus, this 'temple of learning' has excellent and state-of-the-art infrastructure facilities conducive to higher teaching-learning environment and research. The main objective of the University is to provide higher education of global standards and hence, all the programs are designed to meet international standards. Highly experienced and qualified faculty members, continuously engaged in the maintenance and enhancement of student-centric learning environment through innovative pedagogy, form the backbone of the University.

All the programs offered by REVA University follow the Choice Based Credit System (CBCS) with Outcome Based Approach. The flexibility in the curriculum has been designed with industry-specific goals in mind and the educator enjoys complete freedom to appropriate the syllabus by incorporating the latest knowledge and stimulating the creative minds of the students. Bench marked with the course of studies of various institutions of repute, our curriculum is extremely contemporary and is a culmination of efforts of great think-tanks - a large number of faculty members, experts from industries and research level organizations. The evaluation mechanism employs continuous assessment with grade point averages. We believe sincerely that it will meet the aspirations of all stakeholders – students, parents and the employers of the graduates and postgraduates of Reva University.

At REVA University, research, consultancy and innovation are regarded as our pillars of success. Most of the faculty members of the University are involved in research by attracting funded projects from various research level organizations like DST, VGST, DBT, DRDO, AICTE and industries. The outcome of the research is passed on to students through live projects from industries. The entrepreneurial zeal of the students is encouraged and nurtured through EDPs and EACs.

REVA University has entered into collaboration with many prominent industries to bridge the gap between industry and University. Regular visits to industries and mandatory internship with industries have helped our students become skilled with relevant to industry requirements. Structured training programs on soft-skills and preparatory training for competitive exams are offered here to make students more employable. 100% placement of eligible students speaks the effectiveness of these programs. The entrepreneurship development activities and establishment of "Technology Incubation Centers" in the University extend full support to the budding entrepreneurs to nurture their ideas and establish an enterprise.

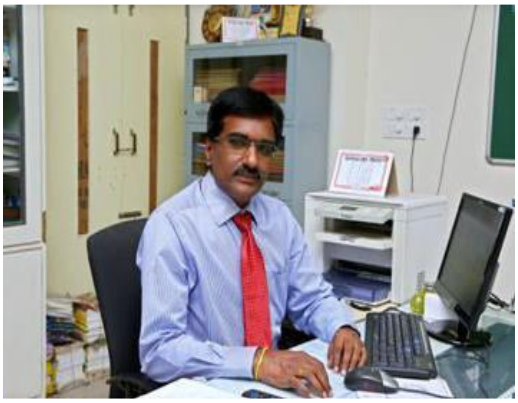
With firm faith in the saying, "Intelligence plus character –that is the goal of education" (Martin Luther King, Jr.), I strongly believe REVA University is marching ahead in the right direction, providing a holistic education to the future generation and playing a positive role in nation building. We reiterate our endeavor to provide premium quality education accessible to all and an environment for the growth of over-all personality development leading to generating "GLOBAL PROFESSIONALS".

Welcome to the portals of REVA University!

Dr.S.Y. Kulkarni

Vice Chancellor,
REVA University

Director's Message



The B.Tech in Civil Engineering is designed keeping in view the current situation and possible future developments, both at national and global levels. This course is designed to give greater emphasis on core Civil Engineering. There are ample number of courses providing knowledge in specialized areas of Structural Engineering, Water Resources Engineering, Transportation Engineering, Geotechnical Engineering, Surveying and Environmental Engineering etc. facilitating students to choose specialized areas of their interest. Adequate attention is given to provide students the basic concepts.

Civil engineering is one of the earliest to start among the core subjects. The structure of the course has undergone a face-lift with the introduction of subjects from latest advanced subjects like Town Planning, Urban Transport Planning, Prestressed & Precast Structures, Solid Waste Management, Industrial Waste Water Treatment etc. Thus the Civil Engineering stream is designed to provide you with several options to choose from for your later years. The Indian government having plans to adopt make in India concept in this major is infrastructure development. Hence Infrastructure development sector offers lots of job opportunities for well qualified graduates.

The program is thus designed to expose students to various subjects having hand on applications in planning, design & construction, through outcome based teaching and learning process which emphasizes practical exposure rather than memorization. A variety of activities such as mini projects, seminars, interaction with industries, cultural activities and social activities are in place to shape the all-round development of students.

If you are interested in any one of the following, then Civil Engineering is the option you should consider.

- **Structural Engineering**- to analyze and design structures, to implement earthquake resisting structures, to maintain quality of construction, to design eco-friendly buildings etc.

- **Water Resources Engineering** - to solve the water for drinking, irrigation etc. To study ground water exploration and recharge.
- **Transportation Engineering**- to resolve the current traffic problems and plan for the future requirements of the society.
- **Environmental Engineering**- to assure and supply the quality drinking water for people and for industries. To protect environment form the air pollution, solid water management and waste water disposal.
- **Geotechnical Engineering**- To study and testing of soils to improve the safe bearing capacity of the soils so that the structure will be safe.

The benefits of choosing Civil Engineering are:

- Flexibility to choose various fields upon graduation.
- Opportunity to work on live problems.
- Opportunity to work on latest technologies.
- Opportunity for designers & planner to plan & design live projects.

I am sure the students choosing B Tech in Civil Engineering in REVA University will enjoy the curriculum, teaching and learning environment, the vast infrastructure and the experienced teachers involvement and guidance. The cirruculum caters to and has relevance to local, regional, national, global developmental needs. We will strive to provide all needed comfort and congenial environment for their studies. Maximum number of courses are integrated with cross cutting issues with relevant to professional ethics, Gender, human values, environment and Sustainability. I wish all students pleasant stay in REVA and grand success in their career.

Dr. Y. Ramalinga Reddy
Director
School of Civil Engineering

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RUKMINI EDUCATIONAL CHARITABLE TRUST

It was the dream of late Smt. Rukmini Shyama Raju to impart education to millions of underprivileged children as she knew the importance of education in the contemporary society. The dream of Smt. Rukmini Shyama Raju came true with the establishment of Rukmini Educational Charitable Trust (RECT), in the year 2002. **Rukmini Educational Charitable Trust** (RECT) is a Public Charitable Trust, set up in 2002 with the objective of promoting, establishing and conducting academic activities in the fields of Arts, Architecture, Commerce, Education, Engineering, Environmental Science, Legal Studies, Management and Science & Technology, among others. In furtherance of these objectives, the Trust has set up the REVA Group of Educational Institutions comprising of REVA Institute of Technology & Management (RITM), REVA Institute of Science and Management (RISM), REVA Institute of Management Studies (RIMS), REVA Institute of Education (RIE), REVA First Grade College (RFGC), REVA Independent PU College at Kattigenahalli, Ganganagar and Sanjaynagar and now REVA University. Through these institutions, the Trust seeks to fulfill its vision of providing world class education and create abundant opportunities for the youth of this nation to excel in the areas of Arts, Architecture, Commerce, Education, Engineering, Environmental Science, Legal Studies, Management and Science & Technology.

Every great human enterprise is powered by the vision of one or more extraordinary individuals and is sustained by the people who derive their motivation from the founders. The Chairman of the Trust is Dr. P. Shyama Raju, a developer and builder of repute, a captain of the industry in his own right and the Chairman and Managing Director of the DivyaSree Group of companies. The idea of creating these top notched educational institutions was born of the philanthropic instincts of Dr. P. Shyama Raju to do public good, quite in keeping with his support to other socially relevant charities such as maintaining the Richmond road park, building and donating a police station, gifting assets to organizations providing accident and trauma care, to name a few.

The Rukmini Educational Charitable Trust drives with the main aim to help students who are in pursuit of quality education for life. REVA is today a family of ten institutions providing education from PU to Post Graduation and Research leading to PhD degrees. REVA has well qualified experienced teaching faculty of whom majority are doctorates. The faculty is supported by

committed administrative and technical staff. Over 13,000 students study various courses across REVA's three campuses equipped with exemplary state-of-the-art infrastructure and conducive environment for the knowledge driven community.

ABOUT REVA UNIVERSITY

REVA University has been established under the REVA University Act, 2012 of Government of Karnataka and notified in Karnataka State Gazette No. 80 dated 27thFebruary, 2013. The University is empowered by UGC to award degrees any branch of knowledge under Sec.22 of the UGC Act. The University is a Member of Association of Indian Universities, New Delhi. The main objective of the University is to prepare students with knowledge, wisdom and patriotism to face the global challenges and become the top leaders of the country and the globe in different fields.

REVA University located in between Kempegowda International Airport and Bangalore city, has a sprawling green campus spread over 45 acres of land and equipped with state-of-the-art infrastructure that provide conducive environment for higher learning and research. The REVA campus has well equipped laboratories, custom-built teaching facilities, fully air-conditioned library and central computer centre, the well planned sports facility with cricket ground, running track & variety of indoor and outdoor sports activities, facilities for cultural programs. The unique feature of REVA campus is the largest residential facility for students, faculty members and supportive staff.

REVA consistently ranked as one of the top universities in various categories because of the diverse community of international students and its teaching excellence in both theoretical and technical education in the fields of Engineering, Management, Law, Science, Commerce, Arts, Performing Arts, and Research Studies. REVA offers 28 Undergraduate Programmes, 22 Full-time and 2 Part-time Postgraduate Programmes, 18 Ph. D Programmes, and other Certificate/ Diploma/Postgraduate Diploma Programmes in various disciplines.

The curriculum of each programme is designed with a keen eye for detail by giving emphasis on hands-on training, industry relevance, social significance, and practical applications. The University offers world-class facilities and education that meets global standards.

The programs being offered by the REVA University are well planned and designed after detailed study with emphasis with knowledge assimilation, applications, global job market and their social

relevance. Highly qualified, experienced faculty and scholars from reputed universities / institutions, experts from industries and business sectors have contributed in preparing the scheme of instruction and detailed curricula for this program. Greater emphasis on practice in respective areas and skill development to suit to respective job environment has been given while designing the curricula. The Choice Based Credit System and Continuous Assessment Graded Pattern (CBCS – CAGP) of education has been introduced in all programs to facilitate students to opt for subjects of their choice in addition to the core subjects of the study and prepare them with needed skills. The system also allows students to move forward under the fast track for those who have the capabilities to surpass others. These programs are taught by well experienced qualified faculty supported by the experts from industries, business sectors and such other organizations. REVA University has also initiated many supportive measures such as bridge courses, special coaching, remedial classes, etc., for slow learners so as to give them the needed input and build in them confidence and courage to move forward and accomplish success in their career. The University has also entered into MOUs with many industries, business firms and other institutions seeking their help in imparting quality education through practice, internship and also assisting students' placements.

REVA University recognizing the fact that research, development and innovation are the important functions of any university has established an independent Research and Innovation division headed by a senior professor as Dean of Research and Innovation. This division facilitates all faculty members and research scholars to undertake innovative research projects in engineering, science & technology and other areas of study. The interdisciplinary-multidisciplinary research is given the top most priority. The division continuously liaisons between various funding agencies, R&D Institutions, Industries and faculty members of REVA University to facilitate undertaking innovative projects. It encourages student research projects by forming different research groups under the guidance of senior faculty members. Some of the core areas of research wherein our young faculty members are working include Data Mining, Cloud Computing, Image Processing, Network Security, VLSI and Embedded Systems, Wireless Censor Networks, Computer Networks, IOT, MEMS, Nano-Electronics, Wireless Communications, Bio-fuels, Nano-technology for coatings, Composites, Vibration Energies, Electric Vehicles, Multilevel Inverter Application, Battery Management System,

LED Lightings, Renewable Energy Sources and Active Filter, Innovative Concrete Reinforcement, Electro Chemical Synthesis, Energy Conversion Devices, Nano-structural Materials, Photo-electrochemical Hydrogen generation, Pesticide Residue Analysis, Nano materials, Photonics, Nana Tribology, Fuel Mechanics, Operation Research, Graph theory, Strategic Leadership and Innovative Entrepreneurship, Functional Development Management, Resource Management and Sustainable Development, Cyber Security, General Studies, Feminism, Computer Assisted Language Teaching, Culture Studies etc.

The REVA University has also given utmost importance to develop the much required skills through variety of training programs, industrial practice, case studies and such other activities that induce the said skills among all students. A full-fledged Career Development and Placement (CDC) department with world class infrastructure, headed by a dynamic experienced Professor& Dean, and supported by well experienced Trainers, Counselors and Placement Officers.

The University also has University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director facilitating skill related training to REVA students and other unemployed students. The University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal Vikas Yojana. The Centre conducts several add-on courses in challenging areas of development. It is always active in facilitating student's variety of Skill Development Training programs.

The University has collaborations with Industries, universities abroad, research institutions, corporate training organizations, and Government agencies such as Florida International University, Okalahoma State University, Western Connecticut University, University of Alabama, Huntsville, Oracle India Ltd, Texas Instruments, Nokia University Relations, EMC^2, VMware, SAP, Apollo etc, to facilitate student exchange and teacher–scholar exchange programs and conduct training programs. These collaborations with foreign universities also facilitates students to study some of the programs partly in REVA University and partly in foreign university, viz, M.S in Computer Science one year in REVA University and the next year in the University of Alabama, Huntsville, USA.

The University has also given greater importance to quality in education, research, administration and all activities of the university. Therefore, it has established an independent Internal Quality division headed by a senior professor as Dean of Internal Quality. The division works on planning, designing and developing different quality tools, implementing them and monitoring the implementation of these quality tools. It concentrates on training entire faculty to adopt the new tools and implement their use. The division further works on introducing various examination and administrative reforms.

To motivate the youth and transform them to become innovative entrepreneurs, successful leaders of tomorrow and committed citizens of the country, REVA organizes interaction between students and successful industrialists, entrepreneurs, scientists and such others from time to time. As a part of this exercise great personalities such as Bharat Ratna Prof. C. N. R. Rao, a renowned Scientist, Dr. N R Narayana Murthy, Founder and Chairman and Mentor of Infosys, Dr. K Kasturirangan, Former Chairman ISRO, Member of Planning Commission, Government of India, Dr. Balaram, Former Director IISc., and noted Scientist, Dr. V S Ramamurthy, Former Secretary, DST, Government of India, Dr. V K Aatre, noted Scientist and former head of the DRDO and Scientific Advisor to the Ministry of Defence Dr. Sathish Reddy, Scientific Advisor, Ministry of Defence, New Delhi and many others have accepted our invitation and blessed our students and faculty members by their inspiring addresses and interaction.

REVA organises various cultural programs to promote culture, tradition, ethical and moral values to our students. During such cultural events the students are given opportunities to unfold their hidden talents and motivate them to contribute innovative ideas for the progress of the society. One of such cultural events is REVAMP conducted every year. The event not only gives opportunities to students of REVA but also students of other Universities and Colleges. During three days of this mega event students participate in debates, Quizzes, Group discussion, Seminars, exhibitions and variety of cultural events. Another important event is Shubha Vidaaya, - Graduation Day for the final year students of all the programs, wherein, the outgoing students are felicitated and are

addressed by eminent personalities to take their future career in a right spirit, to be the good citizens and dedicate themselves to serve the society and make a mark in their respective spheres of activities. During this occasion, the students who have achieved top ranks and won medals and prizes in academic, cultural and sports activities are also recognised by distributing awards and prizes. The founders have also instituted medals and prizes for sports achievers every year. The physical education department conducts regular yoga class's everyday to students, faculty members, administrative staff and their family members and organizes yoga camps for villagers around.

Vision

REVA University aspires to become an innovative university by developing excellent human resources with leadership qualities, ethical and moral values, research culture and innovative skills through higher education of global standards

Misson

- To create excellent infrastructure facilities and state-of-the-art laboratories and incubation centers
- To provide student-centric learning environment through innovative pedagogy and education reforms
- To encourage research and entrepreneurship through collaborations and extension activities
- To promote industry-institute partnerships and share knowledge for innovation and development
- To organize society development programs for knowledge enhancement in thrust areas
- To enhance leadership qualities among the youth and enrich personality traits, promote patriotism and moral values.

Objectives

- Creation, preservation and dissemination of knowledge and attainment of excellence in different disciplines
- Smooth transition from teacher - centric focus to learner - centric processes and activities
- Performing all the functions of interest to its major constituents like faculty, staff, students and the society to reach leadership position
- Developing a sense of ethics in the University and Community, making it conscious of its obligations to the society and the nation
- Accepting the challenges of globalization to offer high quality education and other services in a competitive manner

ABOUT SCHOOL OF CIVIL ENGINEERING

The School of Civil Engineering is headed by highly experienced Professor and is supported by well qualified faculty members. The school has the state-of-art class rooms and well equipped laboratories. It offers B.Tech and M.Tech programs in various specialized streams. The school also has research program leading to doctoral degree. The curriculum of both graduate and post graduate degree programs have been designed to bridge the gap between industry – academia and hence they are industry application oriented. The B.Tech program aims to prepare human resources to play a leading role in the competitive construction field and excel in their endeavors. The Master's Degree programs focus on research and design in the core and Computer Aided Structural Engineering & Transportation Engineering & Management to supplement and create a sustainable world and to enhance the global quality of life by adopting enhanced techniques of design and application. This is reflected in various core subjects offered within the program. Currently Civil Engineering teaching was limited to planning, analysis, design and execution of different types of infrastructure like buildings, roads, bridges, dams and power plants. However, due to increase of technological sophistication and demand for higher living standards geared up by economic growth and concerns about environmental impact have changed the scope of Civil Engineering. The challenges of today's Civil Engineering infrastructure are much more complex and interdependencies between resources.

- Even though there are a large number of institutions in the country which are producing Civil Engineers, there is acute shortage of quality Civil Engineers. The REVA UNIVERSITY would like to offer Civil Engineering Programme to produce quality engineers who are effective and efficient in problem solving and providing economical and sustainable infrastructural solutions.

VISION

"To produce young Engineers of caliber, who would be committed to their profession with ethics, will be able to contribute to Civil Engineering and allied fields in optimizing usage of resources globally making the world more eco-friendly to live in."

MISSION

- *To make the Department centre of excellence for training the undergraduate students.*
- *To promote involvement of staff and students in research and advanced training.*
- *To develop good understanding skills in student communities about Civil Engineering, ethical practices, automation design and society need centric teaching and learning and imparting value addition skills.*

BoS

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B Tech (Civil Engineering) Program

Programme Overview

- Civil Engineering is a professional engineering discipline that deals with the design, construction, and maintenance of the physical and naturally built environment, including works such as roads, bridges, canals, dams, airports, sewerage systems, pipelines, and railways. In the 18th century, the term civil engineering was coined to incorporate all things civilian as opposed to military engineering. The first engineering school, The National School of Bridges and Highways, France, was opened in 1747.

- The modern day civil engineering graduate should have wider knowledge of civil engineering- surveying grading design, drainage, pavement, water supply, sewer service, dams, electric and communications supply and preparations of construction plans. Civil engineers must possess technical knowledge of geotechnical engineering, structural engineering, environmental engineering, transportation engineering and construction engineering as applied to residential, commercial, and industrial and public works projects of all sizes and levels of construction. In addition, present day civil engineers should be able to use CAD/CAE and Virtual reality tools for design and visualization of complex civil engineering structures. If they possess knowledge of IoT and Artificial intelligence will be an added advantage for maintenance and monitoring of infrastructural projects.

- Employment of civil engineers is projected to grow 11 percent over the next ten years, faster than the average for all occupations. Government of India is investing on infrastructure development to rebuild, repair, and upgrade bridges, roads, levees, dams, airports, buildings, railways, metros and other structures.

- A growing population and urbanization means more buildings, new water systems, roads, waste treatment plants leading to increased demand for Civil Engineers.

- The work of civil engineers will be needed for renewable-energy projects. Thus, as these new projects gain approval, civil engineers will be further involved in overseeing the construction of structures such as wind farms and solar arrays.

- Prospects for Civil Engineers are expected to be good. They will be best for those with training in the latest software tools, particularly for computational design and simulation. Such tools allow engineers and designers to take a project from the conceptual phase till the end. Engineers who have experience or training in three-dimensional printing of concrete structures also will have better job prospects.

- **The School of Civil Engineering at REVA UNIVERSITY offers B. Tech., Civil Engineering –an undergraduate programme** to create motivated, innovative, creative and thinking graduates to fill the roles of civil engineers who can work on various infrastructure projects including construction of buildings.

- The B. Tech., in Civil Engineering curriculum developed by the faculty at the **School of Civil Engineering**, is outcome based and it comprises required theoretical concepts and practical skills in the domain. By undergoing this programme, students develop critical, innovative, creative thinking and problem solving abilities for a smooth transition from academic to real-life work environment. In addition, students are trained in interdisciplinary topics and attitudinal skills to enhance their scope. The above mentioned features of the programme, advanced teaching and learning resources, and experience of the faculty members with their strong connections with infrastructure sector makes this programme unique.

Program Educational Objectives (PEO's)

The programme educational objectives of the Civil Engineering of REVA University is to prepare graduates

PEO-1	To have successful professional careers in construction industry, government, academia and military as innovative engineers.
PEO-2	To successfully solve engineering problems associated with planning, design & construction of civil engineering projects by executing construction works effectively either leading a team or as a team member
PEO-3	To continue to learn and advance their careers through activities such as participation in professional organizations, attainment of professional certification for life long learning and seeking higher education.
PEO-4	To be active members ready to serve the society locally and internationally and will take up entrpreneurship for the growth of economy and to generate employment.

Program Outcomes (POs)

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals for the solution of complex problems in civil Engineering.

2. **Problem analysis**: Identify, formulate, research literature, and analyze engineering problems to arrive at substantiated conclusions using first principles of mathematics, natural, and engineering sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components, processes to meet the specifications with consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6**. The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7**. Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively with the engineering community and with society at large. Be able to comprehend and write effective reports documentation. Make effective presentations, and give **and receive clear instructions.**

11. Project management and finance: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team. Manage projects in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes (PSO)

After successful completion of the programme, the graduates shall be able to

- PSO1: Apply knowledge of Construction Engineering, Environmental Engineering, Geotechnical Engineering, Structural Engineering, Surveying, Transportation Engineering and Water Resources Engineering in real time.
- PSO2: Analyse a system, component or process in the knowledge areas of civil engineering in real time problems.
- PSO3: Design a system, component, or process in more than one areas of Civil Engineering.
- PSO4: Conduct investigations and address complex civil engineering problems; utilize and develop innovative tools and techniques that are appropriate in civil engineering discipline.

ADVISORY BOARD

Sl. No.	Name of Members
1	**Dr. A.Veeraraghavan** Professor, Department of Civil Engineering, IIT Madras, Room No:#234, Building Sciences Block, IIT Madras, Chennai-600036 (o) 044-22574272 Fax:044-22570509 Email: av@iitm.ac.in
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CBCS (CHOICE BASED CREDIT SYSTEM) AND CAGP (CONTINUOUS ASSESSMENT AND GRADING PATTERN) OF EDUCATION AND ITS ADVANTAGES

CBCS is a proven, advanced mode of learning in higher education. It facilitates students to have freedom in making their own choices for acquiring a Degree / Masters Degree program. It is more focused towards the student's choice in providing a wide range of modules available in a single campus across various disciplines offered by experts in the subjects. It leads to quality education with active teacher-student participation.

Studying under CBCS has following advantages:

- Students may undergo training in cross-disciplinary and multi-disciplinary subjects and acquire more focused and preferred knowledge.
- Students may get more skills from other subject(s) which are required for the career path in addition to their regular subject knowledge.
- Students may get ample opportunities to use the laboratories and gain practical exposure to the much needed modules available in other departments/schools for want of scientific inputs.
- Courses are conducted by subject experts identified on the basis of their experiences. Courses taught by such experts may provide in-depth information and clear understanding of the modules.
- Students may get an opportunity to study courses with other students of different programs and exchange their views and knowledge in a common class room.
- CBCS provides a cross-cultural learning environment.
- Students may benefit much from selecting the right options to successfully face the public service examinations like UPSC, KPSC, IES wherein the knowledge of additional subjects become mandatory for general or optional papers.
- Students are exposed to the culture of universal brotherhood during their campus life.
- Students are allowed to practice various methods of learning a subject.

Summary of REVA University Regulations for Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) for Four Year Graduate Degree Programs, 2015

1. **Teaching and Learning Process:**

   The Teaching & Learning process under CBCS – CAGP of education in each course of study will have three components, namely**:** L:T:P.

   (i) L= Lecture (ii) T= Tutorial (iii) P=Practice, where:

   L stands for **Lecture** session consisting of classroom instruction.

   T stands for **Tutorial** session consisting participatory discussion / self study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes.

   P stands for **Practice** session and it consists of Hands on Experience / Laboratory Experiments / Field Studies / Case Studies that equip students to acquire the much required skill component.

2. **Courses of Study and Credits**

   a. The study of various subjects in B Tech degree program are grouped under various courses. Each of these course carries credits which are based on the number of hours of teaching and learning.

   b. In terms of credits, every **one hour session of L amounts to 1 credit per Semester** and a minimum of **two hour session of T or P amounts to 1 credit per Semester or a three hour session of T / P amounts to 2 credits** over a period of one Semester of 16 weeks for teaching-learning process.

   c. **The total duration of a semester is 20 weeks inclusive of semester-end examination.**

   d. **A course shall have either or all the four components.** That means a course may have only lecture component, or only practical component or combination of any two or all the three components.

   e. The total credits earned by a student at the end of the semester upon successfully completing the course are L + T + P.

3. **Courses of Study**

Different C**ourses of Study** are labeled and defined as follows:

a. **Core Course:**
A course which should compulsorily be studied by a candidate as a core-requirement is termed as a Core course. The CORE courses of Study are of THREE types, viz – (i) Foundation Course, (ii) Hard Core Course, and (iii) Soft Core Course.

b. **Foundation Course (FC):**
The foundation Course is a core course which should be completed successfully as a part of graduate degree program irrespective of the branch of study.

c. **Hard Core Course (HC):**
The **Hard Core Course** is a Core Course in the main branch of study and related branch(es) of study, if any, that the candidates have to complete compulsorily.

d. **Soft Core Course (SC):**
A Core course may be a **Soft Core** if there is a choice or an option for the candidate to choose a course from a pool of courses from the main branch of study or from a sister/related branch of study which supports the main branch of study.

e. O**pen Elective Course (OE):**
An elective course chosen generally from other discipline / subject, with an intention to seek exposure to the basics of subjects other than the main discipline the student is studying is called an O**pen Elective Course.**

f. **Project Work / Dissertation:**
Project work / Dissertation work is a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A project work carrying **FOUR or SIX** credits is called **Minor Project** work / **Dissertation.** A project work of **EIGHT, TEN, TWELVE or SIXTEEN** credits is called **Major Project** work / **Dissertation**. **A Minor Project work may be a hard core or a Soft Core as decided by the BoS / concerned. But the Major Project shall be Hard Core.**

3. **Scheme, Duration and Medium of Instructions:**

3.1 B Tech degree program is of 8 semesters - 4 years duration. A candidate can avail a maximum of 16

semesters - 8 years as per double duration norm, in one stretch to complete B Tech degree, including blank semesters, if any. Whenever a candidate opts for blank semester, he/she has to study the prevailing courses offered by the School when he/she resumes his/her studies.

3.2 The medium of instruction shall be English

4. **Minimum Credits to be Earned**

4.1 **A candidate has to earn 192 credits for successful completion of B Tech degree** with the distribution of credits for different courses as prescribed by the university. A candidate can enroll for a maximum of 32 credits and a minimum of 20 credits per Semester. However he / she may not successfully earn a maximum of 32 credits per semester. This maximum of 32 credits does not include the credits of courses carried forward by a candidate.

4.2 Only such full time candidates who register for a minimum prescribed number of credits in each semester from I semester to VIII semester and complete successfully 192 credits in 8 successive semesters shall be considered for declaration of Ranks, Medals, Prizes and are eligible to apply for Student Fellowship, Scholarship, Free ships, and such other rewards / advantages which could be applicable for all full time students and for hostel facilities.

4.3. Add- on Proficiency Certification:

To acquire **Add on Proficiency Certification** a candidate can opt to complete a minimum of 4 extra credits either in the same discipline /subject or in different discipline / subject in excess to 192 credits for the B Tech Degree program.

4.3.1. Add on Proficiency Diploma:

To acquire **Add on Proficiency Diploma,** a candidate can opt to complete a minimum of 18 extra credits either in the same discipline /subject or in different discipline / subject in excess to 192 credits for the B Tech Degree program.

The A**dd on Proficiency Certification / Diploma** so issued to the candidate contains the courses studied and grades earned.

5. Scheme of Assessment and Evaluation

5.1. The Scheme of Assessment and Evaluation will have two parts, namely;

i. Internal Assessment (IA); and

ii. Semester End Examination (SEE)

5.2. Assessment and Evaluation of each Course shall be for 100 marks. The Internal Assessment (IA) and Semester End Examination (SEE) of UG Engineering programs shall carry 40:60 marks respectively (i.e., 40 marks internal assessment; 60 marks semester end examination).

5.3. The 40 marks of internal assessment shall comprise of:

Internal Test	= 30 marks
Assignments / Seminars / Model Making etc.	= 10 marks

5.4. There shall be three internal tests conducted as per the schedule given below. The students have to attend all the three tests compulsorily.

- 1st test for 15 marks at the end of 5th week of the beginning of the semester;
- 2nd test for 15 marks at the end of the 10th week of the beginning of the semester; and
- 3rd test for 15 marks at the end of the 15th week of the beginning of the semester.

5.5. The coverage of syllabus for the said three tests shall be as under:

- For the 1st test syllabus shall be 1st unit of the course;
- For the 2nd test it shall be 2nd unit and 1st half of the 3rd unit;
- For the 3rd test the syllabus will be 2nd half of the 3rd unit and complete 4th unit.

5.6. Out of 3 tests, the highest marks scored in **two tests** are automatically considered while assessing the performance of the students.

5.7. There shall be two Assignments / Seminars each carrying 5 marks ; whereas the number of model designs and the marks for each model design shall be decided by the School well in advance and should be announced before commencement of the Semester to avoid ambiguity and confusion among students and faculty members.

5.8. The Semester End Examination for 60 marks shall be held in the 18th and 19th week of the beginning of the semester and the syllabus for the semester end examination shall be entire 4 units.

5.9. The **duration of the internal test shall be 75 minutes and for semester end examination the duration shall be 3 hours**.

5.10. Summary of Internal Assessment and Evaluation Schedule is provided in the table given below.

Summary of Internal Assessment and Evaluation Schedule

Type of Assessment	Period	Syllabus	Marks	Activity
First Test	2nd half of 5th Week	1st Unit	15	Consolidation of 1st Unit
Allocation of Topics for Assignments / Seminars / Model making*	Beginning of 6th Week	First unit and 1st half of second unit		Instructional process and Continuous Assessment
Submission of Assignments / Conduct of Seminars / Presentation of Model Design*	8th Week	First unit and 1st half of second unit	5	Instructional process and Continuous Assessment
Second Test	2nd half of 10th Week	Second unit and 1st half of third unit	15	Consolidation of 2nd and 3rd Unit
Allocation of Topics for Assignments / Seminars / Model making*	Beginning of 11th Week	3rd unit and 1st half of 4th unit		Instructional process and Continuous Assessment
Submission of Assignments / Conduct of Seminars / Presentation of Model Design*	13th Week	3rd unit and 1st half of 4th unit	5	Instructional process and Continuous Assessment
Third Test	2nd half of 15th Week	Second half of third unit and complete 4th Unit	15	Consolidation of 2nd half of 3rd Unit and entire 4th Unit
Semester end practical examination	16th Week	Entire syllabus	60	Conduct of Semester - end Exams
Preparation for Semester–End Exam	16th , 17th &	Entire Syllabus		Revision and preparation for semester–end exam
Semester End Theory Examination	18th Week & 19th Week	Entire Syllabus	60	Evaluation and Tabulation
	End of 20th Week			Notification of Final Grades

Note: 1. **As per the model making is concerned, the School shall decide about the Marks and the Number of Model Designs and as well the schedule of allocation and presentation of model design(s). If the model design carries 5 marks, there shall be two model designs; and in case of 10 marks, there shall be one model design. However, the decision of the School should be announced in the beginning of the Semester for students*

to avoid ambiguity and confusion.

2. Examination and Evaluation shall take place concurrently and Final Grades shall be announced latest by 5 days after completion of the examination.

3. Practical examination wherever applicable shall be conducted after 3rd test and before semester end examination. The calendar of practical examination shall be decided by the respective School Boards and communicated well in advance to the Registrar (Evaluation) who will notify the same immediately.

6. Assessment of Performance in Practical

6.1. The performance in the practice tasks / experiments shall be assessed on the basis of:

a) Knowledge of relevant processes;

b) Skills and operations involved;

c) Results / products including calculation and reporting.

6.2. The 40 marks meant for Internal Assessment (IA) of the performance in carrying out practical shall further be allocated as under:

i	Conduction of regular practical / experiments throughout the semester	20 marks
ii	Maintenance of lab records	10 marks
iii	Performance of mid-term test (to be conducted while conducting second test for theory courses); the performance assessments of the mid-term test includes performance in the conduction of experiment and write up about the experiment.	10 marks
	Total	**40 marks**

63. The 60 marks meant for Semester End Examination (SEE), shall be allocated as under:

i	Conduction of semester end practical examination	40 marks
ii	Write up about the experiment / practical conducted	10 marks
iii	Viva Voce	10 marks
	Total	**60 marks**

6.4. The duration for semester-end practical examination shall be decided by the concerned School Board.

7. Evaluation of Minor Project / Major Project / Dissertation:

7.1. Right from the initial stage of defining the problem, the candidate has to submit the progress reports

periodically and also present his/her progress in the form of seminars in addition to the regular discussion with the supervisor. At the end of the semester, the candidate has to submit final report of the project / dissertation, as the case may be, for final evaluation. The components of evaluation are as follows:

Component – I	Periodic Progress and Progress Reports (25%)
Component – II	Results of Work and Draft Report (25%)
Component– III	Final Evaluation and Viva-Voce (50%). Evaluation of the report is for 30% and the Viva-Voce examination is for 20%.

8. Provision for Appeal

If a candidate is not satisfied with the evaluation of Internal Assessment components (Mid-term Tests and Assignments), he/she can approach the grievance cell with the written submission together with all facts, the assignments, test papers etc, which were evaluated. He/she can do so before the commencement of respective semester-end examination. The grievance cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if his/her submission is found to be baseless and unduly motivated. This cell may recommend taking disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the grievance cell is final.

For every program there will be one grievance cell. The composition of the grievance cell is as follows:-

- The Registrar (Evaluation) - Ex-officio Chairman / Convener
- One Senior Faculty Member (other than those concerned with the evaluation of the course concerned) drawn from the school / department/discipline and/or from the sister schools / departments/sister disciplines – Member.
- One Senior Faculty Members / Subject Experts drawn from outside the University school / department – Member.

9. Eligibility to Appear for Semester End Examination (SEE)

Only those students who fulfill a minimum of 75% attendance in aggregate of all the courses including practical courses / field visits etc, as part of the program, as provided in the succeeding sections, shall be eligible to appear for Semester End examination.

10. Requirements to Pass the Semester and to Carry Forward the Failed Subjects / Courses:

10.1 Requirements to Pass a Course

A candidate's performance from IA and SEE will be in terms of scores, and the sum of IA and SEE scores will be for a maximum of 100 marks (IA = 40 + SEE = 60) and have to secure a minimum of 40% to declare pass in the course. However, a candidate has to secure a minimum of 25% (15 marks) in Semester End Examination (SEE) which is compulsory.

10.2 Provision to Carry Forward the Failed Subjects / Courses:

The student who has failed in a maximum of 4 courses in odd and even semesters together shall move to next semester of immediate succeeding year of study. And he / she shall appear for Semester End examination of failed courses of previous semesters concurrently with odd semester end examinations and / or even semester end examinations of current year of study. However, he / she shall have to clear all courses of both odd and even semesters of preceding year to register for next succeeding semester.

Examples:-

a. Student "A" has failed in 1 Course in First Semester and 3 Courses in Second Semester. He / she is eligible to seek admission for Third Semester and appear for Semester end examination of 1 failed Course of First Semester concurrently with Third Semester end examination. Likewise, he / she is eligible to appear for Semester end examination of 3 failed Courses of Second Semester concurrently with Fourth Semester end examination. However, he / she has to clear all the failed Courses of First and Second Semesters before seeking admission to Fifth Semester.

b. Student "B" has failed in 2 Courses in Third Semester and 2 Courses in Fourth Semester and has passed in all Courses of First and Second Semesters. He / she is eligible to seek admission to Fifth Semester and appear for Semester end examination of 2 failed Courses of Third Semester concurrently with Fifth Semester end examination. Likewise he / she is eligible to appear for Semester end examination of 2 failed Courses of Fourth Semester concurrently with Sixth Semester end examination. However, he / she is not eligible to seek admission to Seventh Semester unless he / she passes in all the failed courses of Third and Fourth Semesters.

c. Student "C" has failed in 4 Courses in Fifth Semester but has cleared all the courses in Sixth Semester. He / She has also passed all the courses of First to Fourth Semesters. Student "C" is eligible to seek admission for Seventh Semester and appear for Semester end examination of 4 failed Courses of Fifth Semester concurrently with Seventh Semester end examination. However, he / she has to pass all the failed courses of Fifth Semester along with Seventh and Eighth Semesters courses to earn B Tech Degree.

d. Student "D" passed in 1to 4 semesters, but failed in 3 courses of 5th Semester and in 1 course of 6th Semester. He / She has also passed all the courses of First to Fourth Semesters. Student "D" is also eligible to seek admission for 7th Semester and appear for Semester end examination of 3 failed courses of 5th Semester concurrently with 7th Semester end examination and one failed course of 6th Semester concurrently with 8th Semester end examination. However, he / she has to pass all the 3 failed courses of Fifth Semester and 1 course Sixth Semester along with Seventh and Eighth Semester courses to earn B Tech Degree.

10.3. Re-Registration and Re-Admission:

a) In case a candidate's class attendance in aggregate of all courses in a semester is less than 75% or as stipulated by the University, such a candidate is considered as dropped the semester and is not allowed to appear for end semester examination and he / she shall have to seek re-admission to that semester during subsequent semester / year within a stipulated period.

b) In such case where in a candidate drops all the courses in a semester due to personal reasons, it is considered that the candidate has dropped the semester and he / she shall seek re-admission to such dropped semester.

11. Attendance Requirement:

11.1. All students must attend every lecture, tutorial and practical classes.

11.2. In case a student is on approved leave of absence (e g:- representing the university in sports, games or athletics, placement activities, NCC, NSS activities and such others) and / or any other such contingencies like medical emergencies, the attendance requirement shall be minimum of 75% of the classes taught.

11.3. Any student with less than 75% of attendance in aggregate of all the courses including practical courses / field visits etc, during a semester shall not be permitted to appear to the end semester examination and such student shall seek re-admission as provided in 10.3.

11.4. Teachers offering the courses will place the above details in the School Board meeting during the last week of the semester, before the commencement of Semester end examination, and subsequently a notification pertaining to the above will be brought out by the Director of the School before the commencement of Semester end examination. A copy of this notification shall also be sent to the office of the Registrar & Registrar (Evaluation).

11.5. Absence during Internal Test:

In case a student has been absent from a internal tests due to the illness or other contingencies he / she may give a request along with necessary supporting documents and certification from the concerned class teacher / authorized personnel to the concerned Head of the School, for conducting a separate internal test. The Head of the School may consider such request depending on the merit of the case and after consultation with course instructor and class teacher, and arrange to conduct a special internal test for such candidate(s) well in advance before the Semester end examination of that respective semester. Under no circumstances internal tests shall be held / assignments are accepted after Semester end examination.

12. Grade Card and Grade Point

12.1. Provisional Grade Card: The tentative / provisional grade card will be issued by the Registrar (Evaluation) at the end of every semester indicating the courses completed successfully. The provisional grade card provides **Semester Grade Point Average** (SGPA).

12.2. Final Grade Card: Upon successful completion of B Tech Degree a Final Grade card consisting of grades of all courses successfully completed by the candidate will be issued by the Registrar (Evaluation).

12.3. The Grade and the Grade Point: The Grade and the Grade Point earned by the candidate in the subject will be as given below.

Marks P	Grade G	Grade Point (GP=V x G)	Letter Grade
90 >100	10	v*10	O
80 > 90	9	v*9	A+
70 > 80	8	v*8	A
60 > 70	7	v*7	B+
55 > 60	6	v*6	B
50 > 55	5.5	V*5.5	C+
40 > 50	5	v*5	C
0-40	0	v*0	F
ABSENT			AB

O - Outstanding; A+-Excellent; A-Very Good; B+-Good; B-Above Average; C+-Average; C-Satisfactory; F – Unsatisfactory.

Here, P is the percentage of marks (P=[IA + SEE]) secured by a candidate in a course which is **rounded to nearest integer**. V is the credit value of course. G is the grade and GP is the grade point.

12.3.1. Computation of SGPA and CGPA

The Following procedure to compute the Semester Grade Point Average (SGPA)

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student in a given semester, i.e : **SGPA (Si) = ∑(Ci x Gi) / ∑Ci** where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

Illustration for Computation of SGPA and CGPA

Illustration No. 1

Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade)
Course 1	**4**	**A+**	**9**	**4X9=36**
Course 2	**4**	**A**	**8**	**4X8=32**
Course 3	**3**	**B+**	**7**	**3X7=21**
Course 4	**3**	**O**	**10**	**3X10=30**
Course 5	**3**	**C**	**5**	**3X5=15**
Course 6	**3**	**B**	**6**	**3X6=18**
Course 7	**2**	**O**	**10**	**2X10=20**
Course 8	**2**	**A**	**8**	**2X8=16**
	24			**188**

Thus, **SGPA = 188 ÷ 24 = 7.83**

Illustration No. 2

Course	Credit	Grade letter	Grade Point	Credit Point (Credit x Grade point)
Course 1	**4**	**A**	**8**	**4X8=32**
Course 2	**4**	**B+**	**7**	**4X7=28**
Course 3	**3**	**A+**	**9**	**3X9=27**
Course 4	**3**	**B+**	**7**	**3X7=21**
Course 5	**3**	**B**	**6**	**3X6=18**
Course 6	**3**	**C**	**5**	**3X5=15**
Course 7	**2**	**B+**	**7**	**2X7=21**
Course 8	**2**	**O**	**10**	**2X10=20**
	24			**175**

Thus, **SGPA = 175 ÷ 24 = 7.29**

Illustration No.3

Course	Credit	Grade Letter	Grade Point	Credit Point (Credit x Grade point)
Course 1	4	O	10	4 x 10 = 40
Course 2	4	A+	9	4 x 9 = 36
Course 3	3	B+	7	3 x 7 = 21
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	B+	7	3 x 7 = 21
Course 7	2	A+	9	2 x 9 = 18
Course 8	2	A+	9	2 x 9 = 18
	24			**199**

Thus**, SGPA = 199 ÷ 24 = 8.29**

12.4. Cumulative Grade Point Average (CGPA):

12.4.1. Overall Cumulative Grade Point Average (CGPA) of a candidate after successful completion of the required number of credits (192) for B. Tech degree in Engineering & Technology is calculated taking into account all the courses undergone by a student over all the semesters of a program, i. e : **CGPA = ∑(Ci x Si) / ∑Ci**

Where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration:
CGPA after Final Semester

Semester (ith)	No. of Credits (Ci)	SGPA (Si)	Credits x SGPA (Ci X Si)
1	24	6.83	24 x 6.83 = 163.92
2	24	7.29	24 x 7.29 = 174.96
3	24	8.11	24 x 8.11 = 192.64
4	26	7.40	26 x 7.40 = 192.4
5	26	8.29	26 x 8.29 = 215.54
6	24	8.58	24 x 8.58 = 205.92
7	24	9.12	24 x 9.12 = 218.88
8	24	9.25	24 x 9.25 =222
Cumulative	196		1588.26

Thus, **CGPA** = 24x6.83+24x7.29+24x8.11+26x7.40+26x8.29+24x8.58+24x9.12+24x9.25 = 8.10
196

12.4.2. CONVERSION OF GRADES INTO PERCENTAGE:

Conversion formula for the conversion of CGPA into Percentage is:

Percentage of marks scored = CGPA Earned x 10

Illustration: CGPA Earned 8.10 x 10=81.0

12.5. Classification of Results

The final grade point (FGP) to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

CGPA	Grade (Numerical Index)	Letter Grade	Performance	FGP
	G			Qualitative Index
9 >= CGPA 10	10	O	Outstanding	Distinction
8 >= CGPA < 9	9	A+	Excellent	
7 >= CGPA < 8	8	A	Very Good	First Class
6 >= CGPA < 7	7	B+	Good	
5.5> = CGPA < 6	6	B	Above average	Second Class
> 5 CGPA < 5.5	5.5	C+	Average	
> 4 CGPA <5	5	C	Satisfactory	Pass

Overall percentage=10*CGPA

13. **Challenge Valuation:**

a. A student who desires to apply for challenge valuation shall obtain a photo copy of the answer script(s) of semester end examination by paying the prescribed fee within 10 days after the announcement of the results. He / She can challenge the grade awarded to him/her by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 10 days after the announcement of the results. **This challenge valuation is only for semester end examination.**

b. The answer scripts for which challenge valuation is sought for shall be evaluated by the external examiner who has not involved in the first evaluation. The higher of two marks from first valuation and challenge valuation shall be the final.

14. With regard to any specific case of ambiguity and unsolved problem, the decision of the Vice-Chancellor shall be final.

List of Codes for Programs and Disciplines / Branch of Study

Program Code	Title of the Program	Discipline Code	Name of the Discipline / Branch of Study
BA	Bachelor of Arts	AE	Advanced Embedded Systems
BB	BBM (Bachelor of Business [illegible])	AI	Advanced Information Technology
BC	B.Com (Bachelor of Commerce)	AP	Advanced Power Electronics
BR	B. Arch (Bachelor of Architecture)	CA	Computer Aided Structural Engineering
BS	B Sc, BS (Bachelor of Science)	CE	Civil Engineering
BT	B. Tech (Bachelor of Technology)	CH	Chemistry
BP	Bachelor of Computer Applications	CO	Commerce
BL	LLB (Bachelor of Law)	CS	Computer Science and Engineering / [illegible]
MA	Master of Arts	DE	Data Engineering and Cloud Computing
MB	MBA (Master of Business Administration)	EC	Electronics and Communication Engineering
MC	M.Com (Master of Commerce)	EN	English
MS	M. Sc / MS (Master of Science)	MD	Machine Design and Dynamics
MT	M Tech (Master of Technology)	ME	Mechanical Engineering
MC	Master of Computer Applications	EE	Electrical & Electronics Engineering

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O2	PS O3	PS O4
BTEM 15F1 100	CO1	3	3	2	1	2	1							3	1	1	1
	CO2	3	3	2	2	2	2							3	1	1	1
	CO3	3	2	2	2	1	1							3	1	1	1
	CO4	3	3	2	2	1	1							3	2	1	1
BTEC 15F1 200	CO1	3	2	3	1	1	3	-	-	-	-	-	2	3			
	CO2	3	3	2	2	1	1	-	-	-	-	-	2	3			
	CO3	3	3	-	-	1	1	-	-	-	-	-	-	3			
BTBE 15F1 300	CO4	3	2	1	1	1	-	-	-	-	-	-	1	3			
	CO1	3	3	3	3	2								1	1	1	1
	CO2	3	3	3	3	3									1	2	
	CO3	3	2	3	3	3										1	1
BTCC 15F1 400	CO4	3	2	3	3	2										1	1
	CO1	3	3	2	3	3	-	1	-	-	-	-	3	3	3	3	3
	CO2	3	2	2	3	2	-	-	-	-	-	-	3	3	3	3	3
	CO3	2	3	2	1	2	-	2	-	-	-	-	3	3	3	3	3
BTES 15F1 500	CO4	3	2	1	2	2	-	2	-	-	-	-	3	3	3	3	3
	CO1						3	2		3	3		3				
	CO2						3	3		3	3		3				
	CO3						3	2		3	2		3				
	CO4						3	3		3	3		3				

BTTE 15F1 600	CO1	2	1	2		1	1			2	1	2	2	2	2	2	2
	CO2	2	1	2		1	1			2	1	2	2	2	2	2	2
	CO3	2	1	2		1	1			2	1	1	2	2	2	2	2
BTED 15F1 700	CO4	2	1	2		1	1			2	1	2	2	2	2	2	2
	CO1	3	2	3	2									3	3	3	3
	CO2	2	2		2								1	3	3	3	3
	CO3	3	3	2	3	1								3	3	3	3
BTCL 15F1 800	CO4	2	2	3	3		2					1	2	3	3	3	3
	CO1	2	2	2		-	-	-	-	-	-	-	-	3	2	1	2
	CO2	2	3	1		1	-	-	-	-	-	-	-	3	2	1	2
	CO3	2	2	1		1	1	-	-	-	-	-	-	3	2	1	2
BTCL 15F1 900																	
	CO1	2	2	2		-	-	-	-	-	-	-	-	3	2	1	2
	CO2	2	3	1		1	-	-	-	-	-	-	-	3	2	1	2
	CO3	2	2	1		1	1	-	-	-	-	-	-	3	2	1	2
BTEP 15F2 100	CO4	2	2	1		1	-	-	-	-	-	-	-	3	2	1	2
	CO1	3	2	2	1	1	1							3	1	1	1
	CO2	3	3	2	1	2	1							3	1	1	1
	CO3	3	3	2	2	1	1							3	1	1	1
	CO4	3	3	2	1	2	1							3	2	1	1
	CO1	3	3		1									3	3	3	3
	CO2	3	2	1										3	3	3	3

BTEP 15F2 200	CO3	3	2					1						3	3	3	3
BTCV 15F2 300	CO1	3	3	2	1		2	1				1	3	3	2	2	3
	CO2	3	3	3	1		1					1	2	3	3	2	2
	CO3	3	3	2	1		1	1				1	2	3	3	2	2
	CO4	3	3	1	1		2	1				1	3	3	2	2	1
BTCV 15F2 400	CO1	3	3	2	1		2	1				1	3	3	2	2	3
	CO2	3	3	3	1		1					1	2	3	3	2	2
	CO3	3	3	2	1		1	1				1	2	3	3	2	2
	CO4	3	3	1	1		2	1				1	3	3	2	2	1
BTEE 15F2 500	CO1	3	2	2	2	-	1	-	-	-	-	-	1	3			
	CO2	3	3	1	2	1	1	-	-	-	-	-	-	3			
	CO3	3	2	2	1	1	1	-	-	-	-	-	-	3			
	CO4	3	2	2	2	1	1	-	-	-	-	-	1	3			
BTIC1 5F26 00	CO1						2		3				2	-	-	-	-
	CO2								3		3		2	-	-	-	-
	CO3	2					2		3		2		3	-	-	-	-
	CO4	2					2		3				2	-	-	-	-
BTCE 15F2 700	CO1						3	2		3	3		3				
	CO2						3	3		3	3		3				
	CO3						3	2		3	2		3				
	CO4						3	3		3	3		3				
	CO1	3	3		1									3	3	3	3
	CO2	3	2	1										3	3	3	3

BTEP 15F2 800	CO3	3	2					1						3	3	3	3
	CO4	3	2					1						3	3	3	3
BTEW 15F2 900	CO1	3	2	2	2		1						1	3			
	CO2	3	3	1	2		1							3			
	CO3	3	2	2	1		1							3			
	CO4	3	2	2	2		1						1	3			
BTCE 15F3 100	CO1	3	3	2	2	1	1							3	1	1	1
	CO2	3	3	2	2	1	1							3	1	1	1
	CO3	3	2	1	3	2	1							3	1	1	1
	CO4	3	2	2	2	2	1							3	2	1	1
BTCE 15F3 200	CO1	3	1	2	1					2	2		2	3	1	2	2
	CO2	3	1	2	2					2	2		3	3	1	2	2
	CO3	3	2	3	1					2	2		2	3	1	2	2
	CO4	3	2	3	1					2	2		3	3	1	2	2
BTCE 15F3 300	CO1	3	1	2	1					2	2		2	3	1	2	2
	CO2	3	1	2	2					2	2		3	3	1	2	2
	CO3	3	2	3	1					2	2		2	3	1	2	2
	CO4	3	2	3	1					2	2		3	3	1	2	2
BTCE 15F3 400	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	-	-	-	-	-	-	-	3	3	3	3	3
	CO4	3	3	1	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO1	3	3	1	1	1	2	1		1	2		3	3	3	3	2

BTCE 15F3 500	CO2	3	3	1	2		2	1		1	2		3	3	3	3	2
	CO3	3	3	2	2	2	2	1		1	2		3	3	3	3	2
	CO4	3	3	2	2	2	2	1		1	2		3	3	3	3	2
BTCE 15F3 600	CO1	3	3	2	3	3	-	3					3	3	3	3	3
	CO2	3	3	2	3	2	-	3					3	3	3	3	3
	CO3	3	3	2	2	2	-	2					3	3	3	3	3
	CO4	3	3	2	2	2	-	2					3	3	3	3	3
BTCE 15F3 700	CO1	3	3	2	1	1	1			1	2	2	2	3	2	2	2
	CO2	3	2	1	2	1	2			1	2	3	2	2	3	2	2
	CO3	3	2	1	2	1	2			1	2	3	2	2	3	2	2
	CO4	3	2	1	2	1	2			1	2	3	2	2	3	2	2
BTCE 15F3 800	CO1	3	3	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO4	3	3	3	2	-	-	-	-	2	-	-	3	3	3	3	3
BTCE 15F4 100	CO1	3	3	1										3	2	1	1
	CO2	3	2	1										3	1	1	1
	CO3	3	3	2	3									3	3	3	2
	CO4	3	3	3	2									3	3	3	1
BTCE 15F4 200	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	-	-	-	-	-	-	-	3	3	3	3	3
	CO4	3	3	1	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO1	3	2	2						2			3	3	3	3	3

BTCE 15F4 300	CO2	3	2	3	2					2			3	3	3	3	3
	CO3	3	2	3	2					2			3	3	3	3	3
	CO4	3	2	3	1					2			3	3	3	3	3
BTCE 15F4 400	CO1	3	3	2	3	3				2			3	3	3	3	3
	CO2	3	3	2	3	2				2			3	3	3	3	3
	CO3	3	3	2	1	2		2		2			3	3	3	3	3
	CO4	3	3	1	2	2		2		2			3	3	3	3	3
BTCE 15F4 500	CO1	2	3	2	1		1	2	1	2	1	1	2	3	3	2	1
	CO2	3	3	3	2		1	2	1	2	1	1	2	3	3	2	1
	CO3	3	3	3	3		1	2	1	2		1	2	3	3	2	1
	CO4	3	3	3	3	2	1	3	1	2	2	2	2	3	3	2	1
BTCE 15F4 600	CO1	3	3	2	3	3		3					3	3	3	3	3
	CO2	3	3	2	3	2		3					3	3	3	3	3
	CO3	3	3	2	2	2		2					3	3	3	3	3
	CO4	3	3	2	2	2		2					3	3	3	3	3
BTCE 17F4 700	CO1	3	3	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO4	3	3	3	2	-	-	-	-	2	-	-	3	3	3	3	3
BTCE 15F4 800	CO1	3	3	2	-	-	-	-	-	2	-	-	3	2	2	3	3
	CO2	3	3	2	-	-	-	-	-	2	-	-	3	2	2	3	3
	CO3	2	2	2	2	-	-	-	-	2	-	-	2	2	2	2	2
	CO4	2	2	2	2	-	-	-	-	2	-	-	2	2	2	2	2

BTCE 15F5 100	CO1	3	2		3		2	2					2	3	1		
	CO2	3	3	3	2	3	2	2	2	1	2	1	2	3	3	3	3
	CO3	3	3	3	2	3	2	2	2	1	2	1	2	3	3	3	3
BTCE 15F5 200	CO4	3	3	3	2	3	2	2	2	1	2	1	2	3	3	3	3
	CO1	3	3	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO2	3	2	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO3	1	3	2	2	3	-	3	-	-	-	-	3	3	3	3	3
BTCE 15F5 300	CO4	1	3	2	2	2	-	2	-	-	-	-	3	3	3	3	3
	CO1	3	3				2	3	3	3	3		1	3	3	2	3
	CO2	3	3	3	2	1	2	2	3	2	2			3	2	3	3
	CO3	3	3	3	3		2	3	3	3	3	1	2	3	3	2	2
BTCE 15F5 400	CO4	3			3	3	3	3	2	2	3		2	3	3		1
	CO1	3		2		2	2	3					1	3	2	1	1
	CO2	2	3	1	2		2		2	1		1		2	3	3	2
	CO3	1	1	3	2	3	3	3			1	2	2	3	2	2	1
BTCE 15F5 500	CO4	3	2	2	1		2		1		2	3		2	3	3	2
	CO1	3	3	1	3	2	2	1			2			3	3	3	2
	CO2	3	2	1	3		2	1			2			3	3	3	2
	CO3	3	2	3	3		2	1			2			3	3	3	1
BTCE 15F5 600	CO4	3	2	3	3		2	1			2			3	3	3	2
	CO1	3	3	1		2	2	1					2	3	3		2
	CO2	3	3	1										3	3		
	CO3	3	3	1		3	2						2	3	3		3

BCE15F5710	CO4	3	3	1		3	2						2	3	3		3
	CO 1					3	2	3	2	2		2	2	3	1	1	3
	CO 2	2				2	2	3	1	1		1	2	3	2	1	3
	CO 3	2		2	1	1	1	3	1	1			2	3	2	1	3
BTCE15F5720	CO 4	3	1		1	1		3	2	1	1		3	3	2	1	3
	CO1	3	2	2	1	-	-	-	-	-	-	-	-	3	3	1	2
	CO2	3	3	1	2	1	-	-	-	-	-	-	-	3	3	1	2
	CO3	2	2	-	-	1	1	-	-	-	-	-	-	3	3	1	2
BTCE15F5730	CO4	2	2	-	1	1	-	-	-	-	-	-	-	3	3	1	2
	CO1	3	1	1	2	3				2			3	3	3	3	3
	CO2	3	3	2	3	2				2			3	3	3	3	3
	CO3	3	3	2	1					1			3	3	3	3	3
BTCE15F5740	CO4	3	3	1	2	3	2	3		2			3	3	3	3	3
	CO1	3	1	1	2	3				2			3	3	3	3	3
	CO2	3	3	2	3	2				2			3	3	3	3	3
	CO3	3	3	2	1					1			3	3	3	3	3
BTCE15F5750	CO4	3	3	1	2	3	2	3		2			3	3	3	3	3
	CO1	3					3		2		2		2	3			1
	CO2	3	3			2		2	2	3	3	1		3	3		1
	CO3	3	3		2	2	3	1		3	1	2		3	3	1	2
	CO4	3	3		2	2	1	2	3		3		2	3			2
	CO1	3	2	2						2			3	3	3	3	3
	CO2	3	2	3	2					2			3	3	3	3	3

BTCE 15F4 300	CO3	3	2	3	2					2			3	3	3	3	3
BTCE 15F5 900	CO4	3	2	3	1					2			3	3	3	3	3
	CO1	3	3	1	1	1	2	1	-	1	2	-	2	3	2	2	2
	CO2	3	2	1	2	1	2	1	-	1	2	-	2	3	2	2	2
	CO3	3	2	2	3	1	2	1	-	1	2	-	2	3	2	2	1
BTCE 15F5 300	CO1	3	3				2	3	3	3	3		1	3	3	2	3
	CO2	3	3	3	2	1	2	2	3	2	2			3	2	3	3
	CO3	3	3	3	3		2	3	3	3	3	1	2	3	3	2	2
	CO4	3			3	3	3	3	2	2	3		2	3	3		1
BTCE 15F6 200	CO1	3	3	1	3	2	2	1			2			3	3	3	2
	CO2	3	2	1	3		2	1			2			3	3	3	2
	CO3	3	2	3	3		2	1			2			3	3	3	1
	CO4	3	2	3	3		2	1			2			3	3	3	2
BTCE 15F6 300	CO1	3	3	1	3	2	2	1			2			3	3	3	2
	CO2	3	2	1	3		2	1			2			3	3	3	2
	CO3	3	2	3	3		2	1			2			3	3	3	1
	CO4	3	2	3	3		2	1			2			3	3	3	2
BTCE 15F6 400	CO1	1	2	3		1		2	1	2				3	3	2	3
	CO2	1	2	3		1			1	2				3	3	3	2
	CO3	3	1	3		1				1				3	3	3	1
	CO4	3	1	3		1		1		1				3	3	3	2
	CO1	3	2	2	-	-	-	-	-	2	-	-	3	3	3	3	3

BTCE 15F6 510	CO2	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO4	3	2	3	1	-	-	-	-	2	-	-	3	3	3	3	3
BTCE 15F6 520	CO1	3	2	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO4	3	2	3	1	-	-	-	-	2	-	-	3	3	3	3	3
BTCE 15F6 610	CO1	3	2	3	2		2	1	2		3	2		3	3		3
	CO2	3	2	2	3	3	2	3	1	2	3	1	2	3	3	1	3
	CO3	3	3	3	1	3	1	1		1	2	3	2	3	3	1	3
BTCE 15F6 620	CO4	2	3	3	2	3	2	3	2	1	1	1	2	3	3	3	3
	CO1	2	3	1										2	3		
	CO2		2	2										3		1	2
	CO3	1	2					1						2		1	
BTCE 15F6 630	CO4	1	2	1										2			1
	CO1	3	1	1	2					1				3	3	3	3
	CO2	2	2	2	1		1				1		1	3	3	3	3
	C03	3	3	2	2			1			1	1		3	3	3	3
BTCE 15F6 640	CO4	3	3	2	2			1			1	1		3	3	3	3
	CO1	3	1	1	2					1				3	3	3	3
	CO2	2	2	2	1		1				1		1	3	3	3	3
	C03	3	3	2	2			1			1	1		3	3	3	3
	CO4	3	3	2	2			1			1	1		3	3	3	3

BTCE 15F6 650	CO1	3	3	2	3	3		3					3	3	3	3	3
	CO2	3	3	2	3	2		3					3	3	3	3	3
	CO3	3	3	2	2	2		2					3	3	3	3	3
BTCE 15F6 700	CO4	3	3	2	2	2		2					3	3	3	3	3
	CO1	1	2	3				2	1					3	3	2	3
	CO2	1	2	3					1					3	3	3	2
	CO3	3	2											3	3	3	1
BTCE 15F6 800	CO4	3	2					1						3	3	3	2
	CO1	3	3	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO2	3	3	2	3	2	-	3	-	-	-	-	3	3	3	3	3
	CO3	3	3	2	2	2	-	2	-	-	-	-	3	3	3	3	3
BTCE 15F7 100	CO4	3	3	2	2	2	-	2	-	-	-	-	3	3	3	3	3
	CO1	3	1	1	2					1				3	3	3	3
	CO2	2	2	2	1		1				1		1	3	3	3	3
	C03	3	3	2	2			1			1	1		3	3	3	3
BTCE 15F7 210	CO4	3	3	2	2			1			1	1		3	3	3	3
	CO1	2	1	1			2	3	1	1	1		2	3	3	2	1
	CO2	3	3	3			2	3	1	1	1		2	3	3	2	1
	CO3	3	3	3	1		2	3	1	1	1		2	3	3	3	1
BTCE 15F7 310	CO4	2	3	3	1		2	3	1	1	1		2	3	3	3	1
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3

BTCE 15F7 320	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3
	CO1	3	3	1	3	2	2	1			2			3	3	3	2
	CO2	3	2	1	3		2	1			2			3	3	3	2
	CO3	3	2	3	3		2	1			2			3	3	3	1
BTCE 15F7 410	CO4	3	2	3	3		2	1			2			3	3	3	2
	CO 1					3	2	3	2	2		2	2	3	1	1	3
	CO 2	2				2	2	3	1	1		1	2	3	2	1	3
	CO 3	2		2	1	1	1	3	1	1			2	3	2	1	3
BTCE 15F7 420	CO 4	3	1		1	1		3	2	1	1		3	3	2	1	3
	CO1	3	3	3	1								3	3	3	3	3
	CO2	3	2	3	2								3	3	3	3	3
	CO3	3	2	3	2								3	3	3	3	3
BTCE 15F7 430	CO4	3	2	3	2			1					3	3	3	3	3
	CO1	3	3	3	1								3	3	3	3	3
	CO2	3	2	3	2								3	3	3	3	3
	CO3	3	2	3	2								3	3	3	3	3
BTCE 15F7 440	CO4	3	2	3	2			1					3	3	3	3	3
	CO1	3	3	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO2	3	2	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO3	1	3	2	2	3	-	3	-	-	-	-	3	3	3	3	3
	CO4	1	3	2	2	2	-	2	-	-	-	-	3	3	3	3	3
	CO1	3	3	3	2						1		1	3	2	3	2
	CO2	3	3	3	2			2		3	3			3	3	3	2

BTCE 15F7 450	CO3	3	3	2	2		1			2	1			3	3	3	2
BTCE 15F7 510	CO4	3	3			2					2	3	2	3	3		1
	CO1	1	1	1		1		2	1	2				3	3	2	3
	CO2	1	2	3		1			1	2				3	3	3	2
	CO3	3	3	3	1	1		1		1				3	3	3	1
BTCE 15F7 520	CO4	3	2	3	1	1		1		1				3	3	3	2
	CO1	3	3	1		2	2	1					2	3	3		2
	CO2	3	3	1										3	3		
	CO3	3	3	1		3	2						2	3	3		3
BTCE 15F7 530	CO4	3	3	1		3	2						2	3	3		3
	CO1	3	3	1		2	2	1					2	3	3		2
	CO2	3	3	1										3	3		
	CO3	3	3	1		3	2						2	3	3		3
BTCE 15F7 540	CO4	3	3	1		3	2						2	3	3		3
	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	2	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	2	-	2	-	2	-	-	3	3	3	3	3
BTCE 15F7 550	CO4	3	3	1	2	2	-	2	-	2	-	-	3	3	3	3	3
	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	2	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	2	-	2	-	2	-	-	3	3	3	3	3

BTCE 15F7 800	CO4	3	3	1	2	2	-	2	-	2	-	-	3	3	3	3	3
	CO1	1	2	3				2	1	1				3	3	2	3
	CO2	1	2	3					1					3	3	3	2
	CO3	3	2	3										3	3	3	1
BTCE 15F7 900	CO4	3	2	-	2			1						3	3	3	2
	CO1	3	3	3	3	3							3	3	3	3	3
	Co2	3	3	3	3	3							3	3	3	3	3
	Co3	3	3	3	3	3		3					3	3	3	3	3
BTCE 15F8 100 / BTCE 15F8 200 BTCE 15F8 310	CO4	3	3	3	3	3		3					3	3	3	3	3
	CO	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	3	3											3	3			3
	3	3	1										3	3			3
BTCE 15F8 320	3	3	2			1					1		3	3		1	3
	2	2	1	2	3	2	1	2	1	1		2	3	3	3	2	2
	CO1	2				2		3				2		3	2	1	2
	CO2	2	2	1		2		2						3	2	1	2
BTCE 15F8 330	CO3	2				3		2						3	3	3	1
	CO4	2				3		1						3	3	3	2
	CO1	3	3	2	3	3							3	3	3	3	3
	CO2	3	3	2	3	2							3	3	3	3	3

BTCE 15F8 340	CO3	3	3	2	1	2		2					3	3	3	3	3
	CO4	3	3	1	2	2		2					3	3	3	3	3
	CO1	3	3	3	2						1		1	3	2	3	2
	CO2	3	3	3	2			2		3	3			3	3	3	2
BTCE 15F8 410	CO3	3	3	2	2		1			2	1			3	3	3	2
	CO4	3	3			2					2	3	2	3	3		1
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
BTCE 15F8 420	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
BTCE 15F8 510	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
BTCE 15F8 520	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3

BTCE 15F8 530	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
BTCE 15F8 530	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
BTCE 15F8 540	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3
	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3

Mapping of PEOS with Respect to POs & PSOs

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
PEO1	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
PEO2	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
PEO3	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
PEO4	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

B. Tech in Civil Engineering
Scheme of Instructions

Sl. No.	Course Code	Course Title	Types of course HC/ SC/OE	Credit Pattern and Value				Weekly Contact Hours	Teaching School/Dept.
				L	T	P	C		
First Semester: CHEMISTRY CYCLE									
1	BTEM15F1100	Engineering Mathematics – I	HC	3	1	0	4	5	Mathematics
2	BTEC15F1200	Engineering Chemistry	HC	2	1	0	3	4	Chemistry
3	BTBE15F1300	Basic Electronics Engineering	HC	2	1	0	3	4	Electronics
4	BTCC15F1400	Computer Concepts & C Programming	HC	2	1	0	3	4	CSE
5	BTES15F1500	Environmental Sciences	FC	1	1	0	2	3	Civil
6	BTTC15F1600	Technical Communication and Documentation	FC	1	1	0	2	3	Humanities
7	BTED15F1700	Computer Aided Engineering Drawing	HC	2	0	2	4	8	Mechanical
8	BTCL15F1800	Chemistry Lab	HC	0	0	2	2	3	Chemistry
9	BTCP15F1900	Computer Programming Lab	HC	0	0	2	2	3	CSE
Total Credits for the First Semester:							25	35	
Second Semester: Chemistry Cycle									
1	BTEM15F2100	Engineering Mathematics – II	HC	3	1	0	4	5	Mathematics
2	BTEP15F2200	Engineering Physics	HC	2	1	0	3	4	Physics
3	BTCV15F2300	Elements of Civil Engineering	HC	2	1	0	3	4	Civil
4	BTME15F2400	Elements of Mechanical Engineering	HC	2	1	0	3	4	Mechanical

5	BTEE15F2500	Basic Electrical Engineering	HC	2	1	0	3	4	Electrical
6	BTIC15F2600	Indian Constitution and Professional Ethics	FC	1	1	0	2	3	Humanities
7	BTCE15F2700	Communicative English	FC	1	1	0	2	3	Humanities
8	BTPL15F2800	Physics Lab	HC	0	0	2	2	3	Physics
9	BTEW15F2900	Basic Electrical Engineering lab and Workshop Practice	HC	0	0	2	2	3	Electrical and Mechanical
Total Credits for the Second Semester:							**24**	**33**	

III SEMESTER

Sl. No	**Course Code**	**Title of the Course**	**HC/FC/SC/OE**	**Pre requisite**	**Credit Pattern & Credit Value**				**Contact Hours / Week**	**Teaching School/Dept.**
					L	**T**	**P**	**Total**		
1	BTCE15F3100	Engineering mathematics-III	HC	BTEM15F1100	3	1	0	4	5	Mathematics
2	BTCE15F3200	Building Materials & Construction Technology	HC	-	2	1	0	3	4	Civil
3	BTCE15F3300	Engineering Earth Science	HC	-	2	1	0	3	4	Civil
4	BTCE15F3400	Surveying	HC	-	2	1	0	3	4	Civil

5	BTCE15F3500	Strength of Materials	HC	BTCV15F2300	3	1	0	3	5	Civil
6	BTCE15F3600	Fluid Mechanics	HC	BTCV15F2300	2	1	0	3	4	Civil
7	BTCE15F3700	Basic Materials Testing Lab	HC	BTCE15F3200	1	0	1	2	3	Civil
8	BTCE15F3800	Surveying Practice Lab	HC	BTCE15F3400	1	0	1	2	3	Civil
Total Credits for the Third Semester								**24**	**31**	

IV SEMESTER

Sl. No	Course Code	Title of the Course	HC/ FC/ SC/ OE	Pre requisite	Credit Pattern & Credit Value				Contact Hours / Week	Teaching School/Dept.
					L	T	P	Total		
1	BTCE15F4100	Concrete Technology & Alternative Building Materials	HC	BTCE15F3200	2	1	0	3	4	Civil
2	BTCE15F4200	Applied Surveying & GIS	HC	BTCE15F3400	2	1	0	3	4	Civil
3	BTCE15F4300	Building Planning & Drawing	HC	BTCE15F3200	1	2	0	3	5	Civil
4	BTCE15F4400	Water Supply Engineering & Introduction to EIA	HC	-	2	1	0	3	4	Civil
5	BTCE15F4500	Basic Structural Analysis	HC	BTCE15F3500	3	1	0	4	5	Civil
6	BTCE15F4600	Hydraulic Machines	HC	BTCE15F3600	3	1	0	4	5	Civil
7	BTCE15F4700	Advanced Surveying Lab	HC	BTCE15F4200	1	0	1	2	3	Civil
8	BTCE15F4800	Engineering Earth Science Lab	HC	BTCE15F3300	1	0	1	2	3	Civil
Total Credits for the Fourth Semester								**24**	**34**	

V SEMESTER

Sl. No	Course Code	Title of the Course	HC/ FC/ SC/ OE	Pre requisite	Credit Pattern & Credit Value				Contact Hours/ Week	Teaching School /Dept.
					L	T	P	Total		
1	BTCE15F5200	Used water treatment & Solid Waste Management	HC	BTCE15F3600	2	1	0	3	4	Civil
2	BTCE15F5300	Transportation Engg-I	HC	-	2	1	0	3	4	Civil
3	BTCE15F5400	Hydrology & Irrigation Engineering	HC	BTCE15F3600	2	1	0	3	4	Civil
4	BTCE15F5500	Geotechnical Engg-I	HC	BTCE15F3600, BTCE15F3500	2	1	0	3	4	Civil
5	BTCE15F5600	Intermediate Structural Analysis	HC	BTCE15F3500	2	1	0	3	4	Civil
6	BTCE15F5710	Design of Masonry Structures	SC	BTCE15F3500	2	1	0	3	4	Civil
	BTCE15F5720	Advanced Surveying		BTCE15F4200	3	1	0	4	5	Civil
	BTCE15F5730	Remote Sensing and GIS		BTCE15F4200	3	1	0	4	5	Civil
	BTCE15F5740	Ground Water Hydraulics		BTCE15F5200	3	1	0	4	5	Civil
	BTCE15F5750	Urban Transport Planning		-	3	1	0	4	5	Civil
7	BTCE15F5800	CAD Lab	HC	BTCE15F3200	3	1	0	4	5	Civil
8	BTCE15F5900	Geotechnical Engineering Lab	HC	BTCE15F5500	1	0	1	2	3	Civil
Total Credits for the Fifth Semester								**26**	**35**	

VI SEMESTER

Sl. No	Course Code	Title of the Course	HC/FC/SC/OE	Pre requisite	Credit Pattern & Credit Value				Contact Hours/ Week	Teaching School/Dept.
					L	T	P	Total		
1	BTCE15F6100	Transportation Engg-II	HC	BTCE15F5300	2	1	-	3	4	Civil
2	BTCE15F6200	Geotechnical Engg-II	HC	BTCE15F5500	2	1	-	3	4	Civil
3	BTCE15F6300	Design of steel structures	HC	BTCE15F3500	2	1	-	3	4	Civil
4	BTCE15F6400	Estimation and project management	HC	-	2	1	-	3	4	Civil
5	BTCE15F6510	Design of Hydraulic structures	SC	BTCE15F3600	2	1	-	3	4	Civil
	BTCE15F6520	Earth and Rock Fill Dams		BTCE15F3600	2	1	-	3	4	Civil
	BTCE15F6610	Repair & rehabilitation of structures		BTCE15F3500	2	1	-	3	4	Civil
	BTCE15F6620	Structural Dynamics		BTCE15F3500	2	1	-	3	4	Civil
6	BTCE15F6630	Earth & Earth retaining structures	SC	BTCE15F5500	2	1	-	3	4	Civil
	BTCE15F6640	Transportation Economics		BTCE15F5300	2	1	-	3	4	Civil
	BTCE15F6650	Air and noise pollution		-	2	1	-	3	4	Civil
	BTCE15F6700	Extensive survey Practice		BTCE15F4200	2	1	-	3	4	Civil
7	BTCE15F6800	HHM Lab	HC	BTCE15F3600	1	0	2	3	3	Civil
Total Credits for the Sixth Semester								**24**	**32**	

VII SEMESTER

Sl. No	Course Code	Title of the Course	HC/FC/SC/OE	Pre requisite	Credit Pattern & Credit Value				Contact Hours/Week	Teaching School/Dept.
					L	T	P	Total		
1	BTCE15F7100	Transportation Engineering-III	HC	BTCE15F6100	2	1	0	3	2	MBA
2	BTCE15F7200	Design & Drawing of RCC & steel Structures	HC	BTCE15F5710, BTCE15F6300	1	1	0	2	1	Civil
3	BTCE15F7310	Design of precast & pre-stressed concrete structures	SC	BTCE15F6300	3	1	0	4	3	Civil
	BTCE15F7320	Advanced Design of Shallow Foundations		BTCE15F6200	3	1	0	4	3	Civil
4	BTCE15F7410	Theory of elasticity	SC	BTCE15F3500	3	1	0	4	3	Civil
	BTCE15F7420	Open channel hydraulics		BTCE15F3600	3	1	0	4	3	Civil
	BTCE15F7430	Foundation engineering in difficult ground		BTCE15F6200	3	1	0	4	3	Civil
	BTCE15F7440	Solid & hazardous waste management		-	3	1	0	4	3	Civil
	BTCE15F7450	Road safety & Management		-	3	1	0	4	3	Civil
5	BTCE15F7510	Design of bridges & water tanks	SC	BTCE15F3500	3	1	0	4	3	Civil
	BTCE15F7520	Matrix methods of structural analysis		BTCE15F3500	3	1	0	4	3	Civil
	BTCE15F7530	Reinforced earth structures		BTCE15F6200	3	1	0	4	3	Civil
	BTCE15F7540	Pavement management system		-	3	1	0	4	3	Civil
	BTCE15F7550	Environmental impact assessment		-	3	1	0	4	3	Civil
6	XXXXXXXXX	Open Elective-II	HC	-	4	0	0	4	4	Civil

7	BTCE15F7800	Concrete & Highway Materials Lab	HC	BTCE15F4100	1	0	1	2	1	Civil
8	BTCE15F7900	Environmental Engineering Lab	HC	-						
Total Credits for the Sixth Semester								**25**	**32**	

VIII SEMESTER

Sl. No	Course Code	Title of the Course	Practical /Term Work / Sessions	Pre requisite	Credit Pattern & Credit Value				Contact Hours/ Week	Teaching School/ Dept.
					L	T	P	Total		
1	BTCE15F8100	Seminar	HC	-	0	0	2	2	0	Civil
2	BTCE15F8200	Project Work	HC	-	0	1	5	6	0	Civil
3	BTCE15F8310	Finite Element Analysis	SC	BTCE15F3500	3	1	0	4	3	Civil
	BTCE15F8320	Ground Improvement Techniques		BTCE15F5500	3	1	0	4	3	Civil
	BTCE15F8330	Industrial Waste Water Treatment		-	3	1	0	4	3	Civil
	BTCE15F8340	Highway Geometric Design		-	3	1	0	4	3	Civil
	BTCE15F8410	Advanced Design of pre-stressed concrete structures	SC	-	3	1	0	4	3	Civil
	BTCE15F8420	Analysis And Design Of Deep Foundation		BTCE15F6200	3	1	0	4	3	Civil
	BTCE15F8430	Earthquake Geotechnical Engineering		BTCE15F6200	3	1	0	4	3	Civil
	BTCE15F8510	Computer Applications in	SC	-	3	1	0	4	3	Civil

		Civil Engineering								
	BTCE15F8520	Environmental Geotechnology		-	3	1	0	4	3	Civil
	BTCE15F8530	Traffic Engineering & Management		-	3	1	0	4	3	Civil
	BTCE15F8540	Earthquake Resistant Design Of Structures		-	3	1	0	4	3	Civil
Total Credits for Eigth Semester								**20**	**24**	
Total credits for all Eight semesters								**192**		

B. Tech in Civil Engineering

DETAILED SYLLABUS

(Effective from Academic Year 2015 - 19)

Semester – I

Course Code: BTEM15F1100	Engineering Mathematics – I	C	L	T	P	CH
Duration: 16 Weeks		3	2	1	0	5

Prerequisites:

Knowledge of basics limits, continuity, differentiation, integration, matrices, determinants, and geometry.

Course Objectives:

1. To understand the concepts of differential calculus and its applications.
2. To familiarize with partial differentiation and its applications in various fields.
3. To familiarize with linear algebraic applications and different reduction techniques.
4. To familiarize with concept of vector calculus and its applications.

Course Outcomes:

1. Apply the knowledge of differential calculus in the field of wave theory and communication systems.
2. Apply the knowledge of Differential Equations in the field of Engineering.
3. Analyze and implement the concepts of Divergence and curl of vectors which play significant roles in finding the Area and volume of the closed surfaces.
4. Apply the knowledge of convergence of the series, which help in forming JPEG image compression.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTEM 15F1 100	CO1	3	3	2	1	2	1							3	1	1	1
	CO2	3	3	2	2	2	2							3	1	1	1
	CO3	3	2	2	2	1	1							3	1	1	1
	CO4	3	3	2	2	1	1							3	2	1	1

Course Contents:

UNIT-I: Differential Calculus-I **[14hrs]**

Successive differentiation, standard results, Leibnitz Theorem (without proof) and problems, Taylors series, Maclaurins series expansion, Indeterminate forms and solution using L'Hospital's rule. Tangents and Normal-Cartesian curves, polar curves, Angle between polar curves, Pedal equation for polar curves. Derivative of arc length – concept and formulae without proof, Radius of curvature-Cartesian, parametric, polar and pedal forms**.**

UNIT-II: Differential Calculus-II **[14hrs]**

Curve Tracing-Cartesian, Parametric and polar forms -examples. Applications – Area, Perimeter, surface area and volume. Computation of these in respect of the curves – (i) Astroid(ii) Cycloid and (iii) Cardioids

Partial Differentiation: Partial derivatives-Euler's theorem-problems, total derivative and chain rule, Jacobians-direct evaluation. Taylor's Expansion of function of two variables. Maxima and Minima for a function of two variables.

UNIT-III:Differential Equations : **[14hrs]**

Exact Equations, Equation reducible to Exact form, Orthogonal Trajectories in Cartesian and polar.

Linear Differential Equations: Definitions, Complete solution, Operator D, Rules for finding the complementary function, Inverse operator, Rules for finding the particular integral, Method of variation of parameters, Method of undetermined coefficients, Cauchy's and Legendres linear equations, simultaneous linear equations with constant coefficients.

Non-Linear Differential Equations(*p*-*y*-*x* forms):.Equations solvable for *p*, *y* and *x*, Singular solution, Clairauts equation.

UNIT-IV: Vector Calculus **[14hrs]**

Differentiation of Vectors, Curves in space, Velocity and acceleration, Tangential and normal acceleration, Relative velocity and acceleration, scalar and vector point functions-Vector operator del. Del applied to scalar point functions-Gradient, Del applied to vector point function-Divergence and curl.

Applications: Line integral-Circulation-work, Surface integral-Flux, Green's Theorem in the plane, Stokes Theorem, Volume integral, Divergence theorem, Green's Theorem, Irrotational and Solenoidal fields, Orthogonal curvilinear coordinates.

Reference Books:

Text books:

1. B.S. Grewal, Higher Engineering Mathematics, 42nd edition, Khanna Publishers, 2013.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9th edition, Wiley Publications, 2012.

Reference Books:

1. B.V. Ramana, "Higher Engineering Mathematics", 1st edition, Tata McGraw Hill Publications 2010.
2. R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", 4th edition, Narosa Publishing House, 2002.

Course Code: BTEC15F1200	Engineering Chemistry	C	L	T	P	CH
Duration: 16 Weeks		3	2	1	0	4

Prerequisites:

Basics of Pre University Chemistry.

Course Objectives:

1. Applied chemistry covers the very basic knowledge required for Civil Engineering students to understand its importance in technology.
2. Sources of water and its treatment for drinking. Different methods of water treatment.
3. Corrosion and metal finishing, explains why and how materials corrode and its Prevention. It also covers the importance of metal finishing in various industries and fabrication of PCB
4. Polymers are all about the properties of various polymeric materials and their Commercial significance. The chapter reveals about technical and commercial Importance of composite materials.

Course Outcomes:

1. The importance of water treatment for drinking.
2. Corrosion phenomenon and precautions to be taken in the selection of materials in controlling corrosion
3. Fabrication of PCB, an important component for electronic industries
4. Properties of polymers and their applications in various field, also that of composite materials in sports, aviation etc.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
BTEC 15F1 200	CO1	3	2	3	1	1	3	-	-	-	-	-	2	3			
	CO2	3	3	2	2	1	1	-	-	-	-	-	2	3			
	CO3	3	3	-	-	1	1	-	-	-	-	-	-	3			
	CO4	3	2	1	1	1	-	-	-	-	-	-	1	3			

Course Contents:

UNIT-I: Cells and Batteries: [**11hrs]**

Introduction to electrochemistry, Basic concepts, Battery characteristics –primary, secondary and reserve batteries, Super capacitors, Lithium batteries.

Fuel cells-Difference between battery and fuel cell, types of fuel cells- construction working, applications, advantages& limitations of Solid oxide fuel cells and phosphoric acid fuel cell.

Photovoltaic cell-Production of single crystal semiconductor by Crystal pulling technique (Czocharlski method), zone refining of si, antireflective coatings,Construction and working of photovoltaic cells and its applications and advantages using elemental si and semiconductors.

UNIT-II: Corrosion & its control & metal finishing. [10hrs]

Introduction: Electrochemical theory of corrosion, Galvanic series Types of Corrosion- Differential metal corrosion Differential aeration corrosion(Pitting & water line),Stress corrosion (Caustic embrittlement), and Grain boundary corrosion, Factors affecting rate of corrosion-Primary, secondary, pilling bed worth role, Energy concept (Pourbiax) under different pH conditions. Corrosion Studies on Al, Fe with phase diagram Corrosion control: Inorganic coating -Anodizing & Phosphating, metal coating- galivanzing & tinning, cathodic protection, Anodic Protection. Role of secondary reference electrode in corrosion studies (calomel ,Ag/AgCl)

Metal Finishing-Technological importance, significances of polarization. Decomposition potential & overvoltage in electroplating, theory of electroplating. Effect of plating variables on the nature of electrodeposit- electroplating process, Electroplating of gold, Introduction to Electro less plating-Cu.

UNIT-III: Introduction to Nano science and Nanotechnology [11 hrs]

Introduction to Nanomaterials, Properties –optical, electrical, magnetic and thermal .Chemical synthesis of Nanomaterials – sol gel (MOx NPs), phase transfer method (Au NPs). Carbon Nanomaterials-Fullerenes, graphene, CNT. Applications of nano materials- nano catalysis, nano-electronics, energy conversion materials (in batteries, solar cells), nano sensors.

Introduction to electromagnetic spectrum-material analysis, Instrumentation-principle, working and applications of UV-Visible, XRD, SEM.

UNIT-IV: polymers: [10 hrs]

Introduction, Types of polymerization-Addition and Condensation, Ziegler's natta catalyst, molecular weight determination by viscosity method, glass transition temperature, Structure and Property relationship. Synthesis &Applications of -Bakelite, ABS, Nylon6,6, PMMA.

Adhesives-Synthesis and applications of epoxy resins, Polymer composites- Synthesis and applications of Kevlar and Carbon fibers, Conducting polymers-Definition, Mechanism of conduction in polyacetylene , Synthesis & applications of conducting Polyaniline,Polymer liquid crystals, Biopolymers, Polymer membranes-ion exchange & ionic conductivity,

REFERENCES:

1. R.V. Gadag and Nithyananda Shetty, Engineering chemistry, 2, revised, I.K. International Publishing House Pvt. Limited, 2010

2. S.F. Jadhav and H.C. Shashidhara, Engineering Chemistry, Himalaya publishing house, First edition,

96, (2004).

3. B.S. Jai Prakash, R. Venugopal, Shivakumaraiah and Pushpa Iyengar, Chemistry for Engineering Students, Subhas publishers, Third edition, 239, (2010).

4. Mars G. Fontana, Corrosion Engineering, Tata McGraw-Hill publishers, Third edition, 12, (2005).

5. Introduction to Nanotechnology by Charles P. Poole Jr., Frank J. Owens Wiley India Publishers

6. Theory and practice in applied chemistry by O.P. Vermani and Narulla, New age international publications

7. Vogel's text book of quantitative chemical analysis by G.H. Jeffery, J. Bassett, J. Mendham and R.C. Denney.

Course Code: BTBE15F1300	**Basic Electronics Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration: 16 Weeks		**3**	**2**	**1**	**0**	**4**

Prerequisites:

Basics of Physics.

Course Objectives:

1. To familiarize with the number systems, Boolean algebra and digital circuit design.
2. To understand the diode characteristics and its applications.
3. To learn the working principles of various electronic circuits.
4. To understand the transistor characteristics and its applications.
5. To compare the different biasing methods of transistors.
6. To understand the working of amplifiers and communication systems.
7. To understand the power electronic devices.

Course Outcomes:

1. To Design the digital circuits using various logic gates.
2. To analyze various diode circuits and work on various application based on electronic instruments.
3. To design of amplifier circuit based on BJT and emonstrate the working of amplifiers and the oscillators.
4. To analyze the various communication techniques and Design Zener voltage regulator

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTBE 15F1 300	CO1	**3**	**3**	**3**	**3**	**2**								**1**	**1**	**1**	**1**
	CO2	**3**	**3**	**3**	**3**	**3**									**1**	**2**	
	CO3	**3**	**2**	**3**	**3**	**3**										**1**	**1**
	CO4	**3**	**2**	**3**	**3**	**2**										**1**	**1**

Course Contents:

UNIT-I: Digital Electronics and Number Systems [14hrs]

Digital Electronics: Introduction, Switching and Logic Levels, Digital Waveform. Number Systems: Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System.

Number base conversions: Binary to Decimal, Decimal to Binary, Binary to Octal, Octal to Binary, Binary to Hexadecimal, Hexadecimal to Binary, Decimal to Octal, Octal to Decimal, Decimal to Hexadecimal, Hexadecimal to Decimal, Octal to Hexadecimal, Hexadecimal to octal.

Complement of Binary Numbers. Binary addition, binary subtraction. Boolean Algebra Theorems, De Morgan's theorem. Digital Circuits: Logic gates, NOT Gate, AND Gate, OR Gate, NAND Gate, NOR Gate, XOR Gate, XNOR Gate. Algebraic Simplification, NAND and NOR Implementation NAND Implementation, NOR Implementation. Half adder and Full adder Implementations.

UNIT-II: Semiconductor Diodes and Applications [13hrs]

p-n junction diode, Characteristics and Parameters, Diode approximations, DC load line analysis, Half-wave rectifier, Two-diode Full-wave rectifier, Bridge rectifier, Capacitor filter circuit, Zener diode voltage regulators: Regulator circuit with no load, Loaded Regulator, Series and Shunt diode Clipping Circuits, Clamping Circuits: Negative and Positive Clamping Circuits, Numerical examples as applicable.

UNIT-III: Bipolar junction Transistors [13hrs]

BJT configuration: BJT Operation, BJT voltages and currents, BJT amplification, Common Base, Common Emitter and Common Collector Characteristics, Numerical examples as applicable.

BJT Biasing: DC load line and Bias Point, Base Bias, Voltage divider Bias, Numerical examples as applicable.

UNIT-IV: Electronic Devices and Applications [14hrs]

SCR, controlled rectifier-full bridge type. Oscillators and applications. OPAMP-summer, subtractor, integrator and differentiator, and typical applications in measurements.

Communication system, embedded system, cellular communication, satellite communication, remote sensing. (block diagram approach)

REFERENCE BOOKS:

1. David A. Bell, "Electronic Devices and Circuits", Oxford University Press, 5th Edition, 2008.

2. D.P. Kothari, I. J. Nagrath, "Basic Electronics", McGraw Hill Education (India) Private Limited, 2014.

Course Code: BTCC15F1400	Computer Concepts and C Programming	C	L	T	P	CH
Duration: 16 Weeks		3	2	1	0	4

Prerequisites:

Nil

Course Objectives:

1. Introduce the fundamentals of computer hardware and software;
2. Provide an understanding of problem solving with computers;
3. Introduce C programming language;
4. Provide a familiarization with the Unix programming environment;
5. Introduceproblem solving through authoring and executing C programs.

Course Outcomes:

A student who successfully completes the course will have the ability to:

1. Use the basic terminology of computer programming; Explain the different Unix commands, their usage and their syntax;
2. Write, compile and debug programs in C language; Use different data types and operators in a computer program;
3. Design programs involving decision structures, loops and functions; Use procedure calls by value and by reference;
4. Use arrays in applications like sorting and searching; Handling strings; Apply the C language knowledge to solve variety of problems.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCC 15F1 400	CO1	**3**	**3**	**2**	**3**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO2	**3**	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO3	**2**	**3**	**2**	**1**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO4	**3**	**2**	**1**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**

Course Contents:

UNIT-I **[11 hrs]**

Introduction to Computer System, Computer Organization, Hardware and Software: Definition of Computer, Early history, Structure of a computer, Information Processing life cycle, Essential computer hardware - Microprocessors, Storage media, Essential computer software, Types and Functions of operating systems, Number systems, Computer processing techniques, Networking.

UNIT-II:Getting started with UNIX – Introduction and Commands: **[10 hrs]**
Introduction to Unix Operating System, Introduction to Basic Command Format, Working with Files, Using the VI text editor, working with Files and Directories, Filename Substitution and Wild Cards, Standard Input, Output & Error, Pipes and redirection, Shell Commands.

UNIT-III: Fundamentals of Problem Solving and Introduction to C Language: **[11 hrs]**
Algorithms and Flow charts, Introduction to C Language – Background, structure of a C Program, Input / Output, Tips and common programming errors, Expressions and Statements, Branching constructs, Looping constructs.

UNIT-IV: More towards C language: **[10 hrs]**
Functions in C, Recursion, Arrays, Strings, Introduction to pointers.

REFERENCE BOOKS:

1. Herbert Schildt, C: The Complete Reference, 4th Edition, Tata McGraw Hill, Published by McGraw-Hill Osborne Media (2000), ISBN 10: 0072121246ISBN 13: 9780072121247

2. Sumitabha Das, UNIX Concepts and Applications, 4th Edition; Tata McGraw-Hill Education **Published Date :** 2006-05-01

3. Reema Thareja, Computer fundamentals and programming in C, Second Edition, Oxford University press, 2016.

4. Kernighan, Dennis Ritchie, The C Programming Language ,2nd edition, Englewood Cliffs, NJ: Prentice Hall, 1988

Course Code: BTES15F1500	Environmental Sciences	C	L	T	P	CH
Duration: 16 Weeks		2	1	1	0	3

Prerequisites:

Pre University Science.

Course Objectives:

1. To gain knowledge on the components of environment and importance of environmental studies.
2. To understand the various types of energy and natural resources.
3. To acquire knowledge with respect to biodiversity, its threats and its conservation and appreciate the concept of ecosystem.
4. To get knowledge about environmental pollution-sources, effects and control measures of environmental pollution.
5. To explore ways for protecting the environment.

Course Outcomes:

On completion of this course the students will be able to:

1. Analyze the environmental conditions and protect it.
2. Find new renewable energy resources.
3. Analyze the ecological imbalances and protect it.
4. List the causes of environmental pollution and design pollution controlled products.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
	CO1						3	2		3	3		3				
	CO2						3	3		3	3		3				

BTES 15F1 500	CO3						3	2		3	2		3				
	CO4						3	3		3	3		3				

Course Contents:

UNIT-I: Introduction:

Basic definitions, Objectives and Guiding principles of Environmental Studies, Components of Environment, Structures of atmosphere, Man-Environment relationship, Impact of Technology on the environment, sustainable environment, Environmental Protection - Role of Government, Initiatives by Non - Governmental Organizations (NGO).

UNIT-II: Energy & Natural Resources:

Energy - Different types of energy, Electro-magnetic radiation. Conventional and Non-Conventional sources - Hydro Electric, Fossil fuel based, Nuclear, Solar, Biomass and Bio-gas. Hydrogen as an alternative future source of Energy, Natural Resources- Water resources, Mineral Resources, Forest Wealth.

UNIT-III: Ecology & Ecosystems:

Ecology- Objectives and Classification, Concept of an ecosystem - structure & function, Balanced ecosystem, Components of ecosystem - Producers, Consumers, Decomposers, Bio-Geo- Chemical Cycles & its Environmental significance (Carbon Cycle and Nitrogen Cycle), Energy Flow in Ecosystem, Food Chains: Types & Food webs Ecological Pyramids.

UNIT-IV: Environmental Pollution:

Introduction, Types, Concepts -Air Pollution, Water Pollution& Noise Pollution. Environmental Degradation- Global Warming, Green Houses Effects, Acid Rain, and Depletion of Ozone Layer.

REFERENCE BOOKS:

1. Benny Joseph, Environmental Studies, Tata McGraw – Hill Publishing Company Limited, 2005
2. Meenakshi P, Elements of Environmental Science and Engineering, Prentice Hall of India Private Limited, New Delhi, 2006
3. Rajagopalan R, Environmental Studies – From Crisis to Cure, Oxford University Press, 2005
4. Raman Sivakumar, Principles of Environmental Science and Engineering, Second Edition, Cengage learning, Singapore, 2005
5. Ranjit Daniels R.J. and JagdishKirshnaswamy, (2009), Environmental Studies, Wiley India Private Ltd., New Delhi, 2009
6. Prakash S.M, Environmental Studies, Elite Publishers, Mangalore, 2007
7. ErachBharucha, Text Book of Environmental Studies, for UGC, University Press, 2005

8. Tyler Miller Jr. G. Environmental Science – Working with the Earth, Eleventh Edition, Thomson Brooks/Cole, 2006

Course Code: BTTE15F1600	Technical Communication and Documentation	C	L	T	P	CH
Duration: 16 Weeks		2	1	1	0	3

Prerequisites:

Pre University English.

Course Objectives:

To make the learning process more practical and participatory.

1. To enhance the process of imparting skills of communication more effective
2. To make the learners aware of the latest communication tools and process.
3. To encourage participation of students and follows an interactive approach.
4. To cater the learners in professionals and academic contexts and in day-to-day interactions.

Course Outcomes:

1. To eradicate their stage fear, able to communicate properly. Students enable to speak, read without any mistakes.
2. To practice LSRW skills and how to use them in a daily life.
3. To exhibits clarity of language, encourages participation of students. And follows an interactive approach.
4. To help standardize the teaching of communication and cater to the learners.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
	CO1	2	1	2		1	1			2	1	2	2	2	2	2	2
	CO2	2	1	2		1	1			2	1	2	2	2	2	2	2

BTTE 15F1 600	CO3	**2**	**1**	**2**		**1**	**1**			**2**	**1**	**1**	**2**	**2**	**2**	**2**	**2**
	CO4	**2**	**1**	**2**		**1**	**1**			**2**	**1**	**2**	**2**	**2**	**2**	**2**	**2**

Course Contents:

UNIT-I : Professional Communication [5hrs]

Introduction to Communication: Types of communication, Barriers to communication, Importance of communication, Technical communication.

UNIT-II: Reading: [5hrs]

Reading skills, Vocabulary, Jargon, Text component: Of Discourse- Francis Bacon, Unity of Minds - Dr. A.P.J Abdul Kalam.

UNIT- III: Writing: [5hrs]

Introduction to writing skills, Common Grammatical errors, Sentence structure, Paragraph writing, Précis, Letter writing, Text component: After Twenty years - O. Henry, The open window- Saki.

UNIT-IV: Listening: [13hrs]

Listening skills, Barriers to Listening, Listening Comprehension and Note- Taking Practice in Listening Comprehension, Enhancing Listening skills Text component: The Refund - Fritz Karinthy.

Speaking: Speaking skills, Phonetics, Stress, Rhythm and Intonation, Practice in speaking skills.

REFERENCE BOOKS:

1. Murphy,Raymond, Intermediate English Grammar, Fourth edition, Cambridge University press, New York, 2012
2. Wren &Martin,English Grammar & Composition, Fifth edition, Cambridge University press, New York, 2001
3. Mudambadithaya G.S., English Grammar and composition, Cambridge University press, New York, 2002
4. Lupton, Mary Jane, *Maya Angelou: A Critical Companion*. Westport, Connecticut: Greenwood Press. ISBN 978-0-313-303225, 1998
5. Booher, Diana. (2004),*Booher's Rules of Business Grammar*, OUP Ur, Penny .(2002),*Grammar Practice Activities*, OUP
6. Glendinning, Eric H. and Beverly Holmstrom, Study Reading: A Course in Reading Skills for Academic Purposes, New Delhi: CUP. Langan, John (1996). College Writing Skills. McGraw Hills, 2008.

Course Code: BTED15F1700	Computer Aided Engineering Drawing	C	L	T	P	CH
Duration: 16 Weeks		4	2	0	2	8

Prerequisites:

Building palnning and Drawing

Course Objectives:

1. To comprehend general projection theory, with emphasis on orthographic projection to represent in two-dimensional views (principal, auxiliary, sections).
2. To dimension and annotate two-dimensional engineering drawings.
3. To understand the application of industry standards and best practices applied in engineering graphics.
4. To emphasize freehand sketching to aid in the visualization process and to efficiently communicate ideas graphically.
5. To introduction of CAD software for the creation of 2D engineering drawings.
6. To the theoretical concepts delivered in this course would help the students to understand the sign considerations and tolerances to be used in the design and manufacture of engineering components.
7. To this course will be very much basics for students to learn and wisely apply for the advanced Computer Aided Engineering (CAE) tools such as ABAQUS, ANSYS etc.

Course Outcomes:

1 To understand the concepts of engineering drawing.
2 To understand the concepts of projection of objects in CAD drawing.
3 To draw the sections of various objects in CAD drawing.
4 To draw the isometric projections of various soilds in view of 2D and simple 3D drawings

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
	CO1	3	2	3	2									3	3	3	3
	CO2	2	2		2								1	3	3	3	3

BTED 15F1 700	CO3	**3**	**3**	**2**	**3**	**1**								**3**	**3**	**3**	**3**
	CO4	**2**	**2**	**3**	**3**		**2**					**1**	**2**	**3**	**3**	**3**	**3**

Course Contents:

UNIT-I: Introduction to Drawing: 12Hours

Introduction to Engineering Drawing: Introduction, Drawing Instruments and their uses, BIS conventions, Drawing sheets, Lettering, Dimensioning, Scales, regular polygons and its methods, tangents, ellipse, parabola, hyperbola, loci, cycloids, trochoids, epi and hypocycloids, spirals and involutes, helix, Co-ordinate system and reference planes.

Introduction to Software (solid edge): 12Hours

Computer screen, layout of the software, standard tool bar/menus and description of most commonly used tool bars, navigational tools Creation of 2D/3D environment. Selection of drawing size and scale. Commands and creation of Lines, Co-ordinate points, axes, poly-lines, square, rectangle, polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend to next ,split, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination and perpendicularity. Dimensioning, line conventions, material conventions and lettering.

Orthographic Projection: Projection – Orthographic Projection – Planes of Projection – Four quadrants – First-angle projection – Third-angle projection – Reference line – Conventions employed.

Projection of points: Points in different quadrants.

Projection of Straight Lines (First-angle Projection only): Parallel to one or both planes – Contained by one or both planes – Perpendicular to one plane and parallel to other plane – Inclined to one plane and parallel to the other – Inclined to both planes.

Projection of Planes: Types of Planes – Perpendicular Planes – Oblique Planes – Projection of Planes - Parallel to one Plane – perpendicular to both planes – perpendicular to one inclines to other – Oblique planes (only change of position method).

UNIT-II:Projection of Solids: 12Hours

Polyhedra (Cube – Tetrahedron - Prisms and Pyramids) – Solids of revolution(Cone and Cylinder) – Solids in simple position – Axis perpendicular to a plane – Axis parallel to both planes – Axis parallel to one plane and inclined to the other – Axis inclined to both plane (only change of position method).

UNIT-III: Sections of Solids: **12Hours**

Section Planes – Sections – True Shape of Section – Sections of Prisms – Sections of Pyramids – Sections of Cylinders – Section of Cones.Developments of Lateral Surfaces of Solids - Polyhedra (Cube – Tetrahedron - Prisms and Pyramids) – Solids of revolution (Cone and Cylinder) and their Frustums.

UNIT-IV:Isometric Projection: **12Hours**

Isometric axes - Lines and Planes – Isometric Scale – Isometric Projection of Planes – Prisms – Pyramids – Cylinders – Cones – Spheres - Hemi-Spheres - frustums - Combination of Solids (Maximum Three). Conversion of Orthographic Drawing to Isometric View / Pictorial Drawing of a simple Machine Components. Application Drawings: Civil drawing (building plans), electrical symbols and circuits, electronic symbols and circuits and simple assembly drawing (bolt and nut).

REFERENCE BOOKS:

1. N.D.Bhatt and V.M. Panchal, Engineering Drawing, 48th Edition, Charotar Publishing House, Gujarat, 2005.
2. A Primer on Computer Aided Engineering Drawing-2006, Published by VTU, Belgaum.
3. Dr Balaveer Reddy and Co authors, Computer Aided Engineering Drawing, CBS Publications, 2014
4. K.R. Gopalakrishna Engineering Graphics, 32nd Edition,Subhas Publishers, Bangalore 2005.
5. P. S. Gill, Engineering Drawing, 11th Edition, S. K. Kataria & Sons, Delhi2001.

E-Material:

Computer Aided Engineering Drawing- Vol I, (PPT) by Dr. Rajashekar Patil and Prof Gururaj Sharma T

Course Code: BTCL15F1800	Engineering Chemistry Lab	C	L	T	P	CH
Duration: 16 Weeks		0	0	0	2	3

Prerequisites:

Basics of Engineering Chemistry

Course Objectives:

To provide students with practical knowledge of quantitative analysis of materials by classical and instrumental methods for developing experimental skills in building technical competence

Course Outcomes:

On completion of lab course students will have the knowledge in;

1. Handling of Chemicals and COD can be determined.
2. Handling different types of instruments for analysis of materials for better accuracy and precision
3.
4. Carrying out different types of titrations for quantitative estimations of materials.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
BTCL15F1800	CO1	2	2	2		-	-	-	-	-	-	-	-	3	2	1	2
	CO2	2	3	1		1	-	-	-	-	-	-	-	3	2	1	2
	CO3	2	2	1		1	1	-	-	-	-	-	-	3	2	1	2
	CO4	2	2	1		1	-	-	-	-	-	-	-	3	2	1	2

Course Contents:

LAB EXERCISES

1. Potentiometric estimation of FAS using standard $K_2Cr_2O_7$
2. Conductometric estimation of an acid mixture using standard NaOH solution
3. Determination of pKa of a weak acid using pH meter
4. Determination of molecular weight of given polymer sample using ostmail's Viscometer
5. Colorimetric estimation of copper
6. Determination of COD of the given industrial waste water sample
7. Determination of total and temporary hardness of water using disodium salt of EDTA
8. Estimation of alkalinity of given water sample using standard HCl solution.
9. Determination of Iron in the given haematite ore solution using potassium dichromate
10. Determination of calcium oxide in the given sample of cement by rapid EDTA method
11. Flame photometric estimation of sodium in the given sample of water
12. Electroplating of copper and nickel

REFRENCE BOOKS:

1. Engineering Chemistry of Wiley India Pvt. Ltd., Vairam and others, 2014 edition (second).
2. S. S. Dara, Mukkanti, "Text of Engineering Chemistry", S. Chand & Co, New Delhi, 12th Edition, 2006
3. C. V. Agarwal, C. P. Murthy, A. Naidu, "Chemistry of Engineering Materials", Wiley India, 5th Edition, 2013.

Course Code: BTCP15F1900	**Computer Programming Lab**	C	L	T	P	CH
Duration: 16 Weeks		2	0	0	2	3

Course Objectives:

1. Introduce the Basic Principles of Problem Solving using a Computer;
2. Present and Provide the Programming Constructs of 'C' Programming Language;
3. Provide the skills required to Design, Demonstrate and Implement Computable Problems / Mini-projects / Projects using 'C' Programming Language;
4. Provide the Arena for Development of Analytical, Reasoning and Programming Skills;
5. Set the Strong Foundation for Software Development in the field of Programming and hence to Create high quality 'C' Professionals.

Course Outcomes:

After completion of this course, the students would be able to

1. Understand the Basic Principles of Problem Solving; Study, understand and identify the Representation of Numbers, Alphabets and other Characters in the memory of Computer System;
2. Understand Analyze, Integrate, Apply and Demonstrate Software Development Tools; like Algorithms, Pseudo Codes and Programming Structures;
3. Study, Understand, Analyze and Categorize the logical structure of a Computer Program, and hence to Apply different programming constructs to develop a Computer Program using 'C' Programming

Language; Offer Engineering Solutions to simple (moderate) mathematical and logical problems using 'C' Programming Language;

4. Study, Understand, Analyze, Integrate, Classify, Compare and Apply simple Data Structures, Pointers, Memory Allocation and Data Handling through files using 'C' Programming Language; Understand and identify the working of different Operating Systems; like Windows and Linux; Enhance their Analytical, Reasoning and Programming Skills;

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCL 15F1 900	CO1	**2**	**2**	**2**		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**1**	**2**
	CO2	**2**	**3**	**1**		**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**1**	**2**
	CO3	**2**	**2**	**1**		**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**1**	**2**
	CO4	**2**	**2**	**1**		**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**2**	**1**	**2**

Course Contents:

1. Unix Commands – execution and learn extra options than what is taught in theory
2. How to edit, compile and execute a C program on UNIX using editors like G-edit, K-write, writing a shell program.
3. Programs on data types, operators, expressions
4. Conditional statements – simple if statement, if-else statement, nested if-else, else-if ladder, switch statement
5. Looping statements – for, while and do-while statements
6. Arrays – 1-D and 2-D arrays
7. Programs on Sorting and searching
8. User defined Functions – pass by value, pass by reference, passing arrays to functions
9. Strings – finding length, string concatenation, string compare, substring search, palindromes etc
10. Programs on pointers.

Recommended Learning Resources:

1. Herbert Schildt, C: The Complete Reference, 4th Edition, Tata McGraw Hill
2. Sumitabha Das, UNIX Concepts and Applications, 4th Edition; Tata McGraw Hill
3. Reema Thareja, Computer fundamentals and programming in C.
4. Kernighan, Dennis Ritchie, The C Programming Language ,2nd edition, Englewood Cliffs, NJ: Prentice Hall, 1988
5. http://c-faq.com/index.html
6. Paul Deitel, C How to Program, 7th Edition, Deitel How to Series.

SEMESTER II

Course Code: BTEM15F2100	**Engineering Mathematics – II**	C	L	T	P	CH
Duration: 16 Weeks		4	3	1	0	5

Prerequisites:

Differential Equations and Linear Algebra

Course Objectives:

1. How to solve linear Partial Differential Equations with different methods.
2. Find the magnitude, direction and component form of displacement vectors.
3. To study and understand the application approach of the concepts of Vector calculus.
4. Introduce students to some physical problems in Engineering models that results in partial differential equations.

Course Outcomes:

1. Classify partial differential equations and transform into canonical form.
2. Use vector models for applications of velocity, force, work, finding angles between vectors, and projections.
3. Solve civil engineering problems by using vector concept.
4. Solve linear partial differential equations of both first and second order.

Mapping of Course Outcomes with programme Outcomes

Course Code	**POS/ COs**	**PO 1**	**P 0 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**P S O 1**	**PS O2**	**PS O3**	**PS O4**
BTEM 15F2 100	CO1	3	2	2	1	1	1							3	1	1	1
	CO2	3	3	2	1	2	1							3	1	1	1
	CO3	3	3	2	2	1	1							3	1	1	1

	CO4	3	3	2	1	2	1							3	2	1	1

Course Contents:

UNIT-I: Linear Algebra [14hrs]

Elementary row and column operations on a matrix, Rank of matrix, Normal form, Inverse of a matrix using elementary operations, Solution of a system of non-homogeneous equations by Gauss elimination and Gauss –Jordan methods. Reduction to diagonal form, Reduction of a quadratic form to canonical form, orthogonal transformation and congruent transformation. Rayleigh Power method to find the largest eigen value and corresponding eigen vector.

UNIT-II : Integral Calculus [14hrs]

Differentiation under the integral sign – simple problems with constant limits. Reduction formulae for the integrals of $\sin^n x$,$\cos^n x \sin^n x \cos^n x$and evaluation of these integrals with standard limits - Problems.

Multiple Integrals **–** Double integrals, change of order of integration, double integrals in polar coordinates, area enclosed by plane curves, Beta and Gamma functions – definitions- relation between beta and gamma functions and problems.

Applications: Volume of solids, Change of variables, Area of a curved surface, Calculation of mass.

UNIT-III: Partial Differential Equation [14hrs]

Introduction: Formation of Partial differential equations, Solutions of non-homogeneous PDE by direct integration, Solutions of homogeneous PDE involving derivatives with respect to one independent variable, Solution of Lagranges linear PDE, Solutions of PDE by product method,

Applications: vibrations of a stretched string-Wave equation, one dimensional heat flow. Laplace equation using separation of variables.

UNIT-IV: Laplace Transforms: [14 hrs]

Introduction, definition, Transforms of elementary functions, properties of Laplace Transforms, Transforms of derivatives, Transforms of integrals, evaluation of integrals by Laplace transforms, Transforms of periodic functions, Unit step functions and unit impulse functions.

Inverse Laplace transforms- Problems, convolution theorem-problems, solution of linear differential equation using Laplace transforms, simultaneous linear equations, Applications of Laplace transforms.

Text books:

1. B.S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, 42nd edition, 2013.
2. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Publications, 9th edition, 2012.

Reference Books:

1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Publications, 1stedition, 2010.
2. R.K.Jain and S.R.K.Iyengar, "Advanced Engineering Mathematics", Narosa Publishing House, 4th edition, 2002.

Course Code: BTEP15F2200	Engineering Physics	C	L	T	P	CH
Duration: 16 Weeks		3	2	1	0	4

Prerequisites:

Basics of Pre University Physics.

Course Objectives:

1. To make a bridge between the physics fundamentals which they studied in schools and their applications which they are going to study in Civil Engineering.
2. To be acquainted with the basic concepts of properties of fluids, pressure and its measurements.
3. To get exposed to basic concepts of elastic properties of solids, vibrations & To Know about the different types of kinematic motions

Course Outcomes:

Understand the Concepts of Kinematics

1. Understand the advanced concepts of wave mechanics.
2. Understand and demonstrate different applications of Laser and optical fibers.
3. Understands the concepts of conductors and nano materials.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTEP 15F2 200	CO1	3	3		1									3	3	3	3
	CO2	3	2	1										3	3	3	3
	CO3	3	2					1						3	3	3	3

Course Contents::

UNIT-I:Wave mechanics: [10hrs]

Introduction to Wave mechanics, Wave particle dualism. de-Broglie hypothesis,Matter waves and their characteristic properties. Expression for de-Broglie wavelength of an electron in terms of

accelerating potential. Phase velocity and group velocity,Relation between phase velocity and group velocity. Relation between group velocity and particle velocity, Expression for de-Broglie wavelength using the concept of group velocity. Heisenberg's uncertainty principle ,its significance and its applications(non existence of electron inside the nucleus) . Wave function,properties of wave function and physical significance. Probability density and Normalization of wave function, Schrodinger time- dependent and independent wave equation,Eigen values and Eigen functions. Applications of Schrödinger wave equation – energy Eigen values of a free particle, Particle in one dimensional infinite potential well. Numericals.

UNIT-II: Lasers and optical fibers:[11hrs]

LasersInteraction between radiation and matter (induced absorption, spontaneous and stimulated emission). Expressionfor energy density at thermal equilibrium in terms of Einstein's coefficients. Characteristics of laser light, Conditions for laser operation (population inversion and Meta stable state). Requisites oflaser system, Construction and working of Carbon Dioxide (CO_2) laser & semiconductor laser. Applications: Holography (recording and reconstruction of images) and its applications, Numericals.

Optical fibers: Construction and light propagation mechanism in optical fibers (total internal reflection and its importance), Acceptance angle, Numerical Aperture (NA), Expression for numerical aperture in terms of core and cladding refractive indices,Condition for wave propagation in optical fiber, V-number and Modes of propagation,Types of optical fibers, Attenuation and reasons for attenuation,Applications: Explanation of optical fiber communication using block diagram, Optical source (LED) and detector (Photodiode). Advantages and limitations of optical communications, Numericals.

UNIT-III: Electrical properties of conductors and superconductors: [10hrs]

Electrical Conductivity in Metals, Drude-Lorentz classical free electron theory,drift velocity, mean free path, mean collision time and relaxation time.Expression for electrical conductivity in metals,Effect of impurity and temperature on electrical resistivity in metals,Failures of classical free electron theory. Quantum free electron theory, Fermi-Dirac statistics, Fermi level, Fermi energy and Fermi factor, Variation of Fermi factor with energy and temperature, Density of states (qualitative explanation), effective mass, Merits of Quantum free electron theory, Numericals.

Superconductors: Temperature dependence of resistivityin superconductors, variation of critical field with temperature,Properties of superconductors (Isotope effect, Meissner effect, Silsbee effect), Types of superconductors, BCS theory, Applications of super conductors,Maglev vehicle and superconducting magnet.

UNIT-IV: Ultrasonics, Dielectric and Nanomaterials: **[11hrs]**

Ultrasonics: Production of ultrasonics by piezoelectric method, Measurement of velocity of ultrasonics in solid andliquid, Non-destructive testing of materials using ultrasonics.

Dielectricmaterials: Electric dipole and dipole moment, electric polarization (P), dielectric susceptibility (χ,), dielectric constant, relation between χ and P,Electrical polarization mechanisms (electronic,ionic, orientational, space charge polarization),Expression for internal fieldin one-

dimensional solid dielectrics, Ferro, Piezo and Pyro electric materials – their properties and applications, Numericals.

Nanomaterials: Introduction to nanoscience, nanomaterials and their applications, Synthesis of nano materials using bottom-up method (arc method), top-down methods (ball milling method), Carbon Nanotubes: properties andapplications.

Text books:

1. R.K Gaur and S.L. Gupta, Engineering Physics, Dhanpat Rai Publications (P) Ltd, New Delhi.
2. M.N. Avadhanulu and P.G. Kshirsagar, S. Chand and Company, A text book of Engineering Physics, New Delhi.
3. Solid State Physics, S.O. Pillai, New Age International publishers, New Delhi.

Reference Books:

1. Laser Fundamentals, William T. Silfvast, 2nd Edition, Cambridge University press, New York (2004).
2. Fundamentals of Physics, 6th Edition, D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, New York (2001).
3. Introduction to Solid State Physics,7th Edition Charls Kittel, Wiley, Delhi (2007).
4. Arthur Beiser, Concepts of modern Physics, Tata McGraw Hill publications, New Delhi.

Course Code: BTCV15F2300	**Elements of Civil Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration: 16 Weeks		**3**	**2**	**1**	**0**	**4**

Pre University Physics

Course Objectives:

1. To understand a broad concept of engineering mechanics.
2. To understand the basics of composition of coplanar forces.
3. To understand the concept of equilibrium of coplanar forces.
4. To provide an overview of centroid of plane area & Moment of Inertia of plane area.

Course Outcomes:

1. Describe the moment of force and couples and equivalent force-couple system.
2. Solve numerical problems on composition of coplanar concurrent and non-concurrent force system.
3. Solve numerical problems on equilibrium of coplanar force system.
4. Locate the centroid and moment of inertia of different geometrical Shapes.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCV 15F2 300	CO1	3	3	2	1		2	1				1	3	3	2	2	3
	CO2	3	3	3	1		1					1	2	3	3	2	2
	CO3	3	3	2	1		1	1				1	2	3	3	2	2
	CO4	3	3	1	1		2	1				1	3	3	2	2	1

Course Contents:

UNIT-I [14hrs]

Introduction to basic civil engineering – Scope of civil engineering, role of civil engineer, branches of civil engineering (brief discussion 2 to 3 hours only)

Engineering mechanics

Basic idealizations - Particle, Continuum and Rigid body; Force and its characteristics, types of forces, Classification of force systems; Principle of physical independence of forces, Principle of superposition of forces, Principle of transmissibility of forces; Newton's laws of motion, Introduction to SI units, Moment of aforce, couple, moment of a couple, characteristics of couple, Equivalent force - couple system, Resolution of forces, composition of forces; Numerical problems on moment of forces and couples and equivalentforce - couple system.

UNIT-II [14hrs]

Analysis of Force Systems

Composition of forces - Definition of Resultant, Composition of coplanar -concurrent force system, Parallelogram Law of forces, Principle of resolved parts, Numerical problemson composition of coplanar concurrent force systems, Composition of coplanar - non-concurrent force system, Varignon'sprinciple of moments; Numerical problems on composition of coplanar concurrent force systems.

UNIT-III [14hrs]

Equilibrium of coplanar forces

Definition of static equilibrium and Equilibrant, Conditions of staticequilibrium for different coplanar force systems, Lami's theorem, Concept of Free Body Diagram, Numericalproblems on equilibrium of coplanar – concurrent and non concurrent force systems.

UNIT-IV **[14hrs]**

Centroid and Moment of Inertia

Centroid: Introduction to the concept, Centroid of plane figures, Locating the centroid of triangle, semicircle,quadrant of a circle and sector of a circle using method of integration, Centroid of composite sections; Numerical problems.

Moment of Inertia: Introduction to the concept, Rectangular and polar moment of inertia, Radius of gyration,Perpendicular axis theorem and Parallel axis theorem, Moment of Inertiaof rectangle, circle, semi-circle, quarter circle and triangle from method of integration, Moment of inertia of composite areas, Numerical problems.

Text Books:

1. M. N. Shesha Prakash and Ganesh B. Mogaveer, **"Elements of Civil Engineering and Engineering Mechanics"**, PHI Learning, 3rd Revised edition
2. A. Nelson, **"Engineering Mechanics-Statics and Dynamics"**, Tata McGrawHill Education Private Ltd, New Delhi, 2009
3. S. S. Bhavikatti, **"Elements of Civil Engineering"**, New Age InternationalPublisher, New Delhi, 3rd edition 2009.

Reference Books:

1. S. Timoshenko, D.H. Young and J.V. Rao, **"Engineering Mechanics"**, TATA McGraw-Hill Book Company, New Delhi
2. Beer FP and Johnston ER, **"Mechanics for Engineers- Dynamics andStatics"**, 3rd SI Metric edition, Tata McGraw Hill. - 2008
3. Shames IH, **"Engineering Mechanics–Statics & Dynamics"**, PHI–2009.

Course Code: BTME15F2400	**Elements of Mechanical Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration: 16 Weeks		**3**	**2**	**1**	**0**	**4**

Course Objectives:

1. To develop the basic knowledge of working of various turbines and IC engines
2. To incorporate the concepts of metal joining process, their applications and power transmission modes like belt drives, gears and gear trains
3. To understand various mechanical machines and operations.
4. Introduce about lubrication and its importance.
5. To understand basic power transmission concepts.

Course Outcomes:

The student will be able to

1. Apply the concepts of working principle of turbines in the power plants and also of the IC engines in the basic design of the vehicles
2. Have a basic knowledge of metal joining and power transmission and apply them in some basic requirements
3. Gain the knowledge about machine tools and cutting operations.

4. Gain the knowledge about belt and gear drive power transmission.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCV 15F2 400	CO1	3	3	2	1		2	1				1	3	3	2	2	3
	CO2	3	3	3	1		1					1	2	3	3	2	2
	CO3	3	3	2	1		1	1				1	2	3	3	2	2
	CO4	3	3	1	1		2	1				1	3	3	2	2	1

Course Contents:

UNIT–I:

Properties of steam - Introduction**,** Steam formation, Types of steam. Steam properties, Specific Volume, Enthalpy and Internal energy, Steam table and simple numerical problems

Steam Generators – classification, Lancashire boiler, Babcock and Wilcox boiler, Boiler mountings, accessories and applications

Turbines- Introduction to turbines & prime movers, Classification of turbines, Working principle and applications of impulse and reaction steam turbines, gas turbines (open and closed cycle type) and water turbines (Pelton wheel, Francis and Kaplan), Compounding of impulse turbine

UNIT–II:

Internal Combustion Engines – Introduction, Classification of IC engines, parts of IC engine, Working principle of four stroke (petrol and diesel) and two stroke petrol engines, differences between 4 Stroke & 2 Stroke engines and petrol & diesel engines, Numerical problems on power and efficiencies.

Refrigeration and Air conditioning- Introduction, Principle of refrigeration, parts of refrigerator, Principle and working of vapor compression refrigeration and vapor absorption refrigeration.Refrigerants, Properties of refrigerants, Refrigerating effect, Ton of Refrigeration, COP, Relative COP, UNIT of Refrigeration, Principle and applications of Room air conditioners.

UNIT–III:

Machine Tools- Introduction, working principle and classification of lathe, drilling and milling machines, major parts of a lathe and their functions, lathe operations on lathe - Specifications of lathe, parts of radial drilling machines, drilling operations, parts of horizontal milling machines, milling operations.

Metal joining processes- Introduction, classification of metal joining processes, method of welding (Electric Arc welding), soldering and brazing and their differences.

UNIT-IV:

Lubrication- Necessity, types of lubrications, properties of good lubricant.

Bearings- Classification and application of bearings only.

Power Transmission- Introduction totransmission systems and its classification, types of Belt Drives**,** Definitions of Velocity ratio, angle of contact Creep and slip, Idler pulley, stepped pulley, fast & loose pulley, simple problems.

Gears - Definitions, Spur gear terminology, Types and applications of Gears.

Gear Trains – Simple and compound gear trains, Simple problems on gear trains.

Text Books:

1. K.R. Gopalkrishna, A Text Book of Elements of Mechanical Engineering –Subhash Publishers, Bangalore.

2. Kestoor Praveen and M.R. Ramesh Elements of Mechanical Engineering –2nd Edition, Suggi Publications**,** 2011,

Reference Books:

SKH Chowdhary, AKH Chowdhary , Nirjhar Roy, The Elements of Workshop Technology - Vol I & II , 11th edition 2001, Media Promotors and Publishers, Mumbai.

Course Code: BTEE15F2500	**Basic Electrical Engineering**	**C**	**L**	**T**	**P**	**CH**
Duration: 16 Weeks		**3**	**2**	**1**	**0**	**4**

Course Objectives:

1. To establish a broad concept of various types of generation of electricity.
2. To make students understand the basics of representation of electrical quantities and relationship among them.
3. To provide an overview of various types of electrical apparatus.
4. To introduce the concept of domestic wiring and importance of safety and sensing devices.
5. To provide an insight into various sources of power generation.

Course Outcomes:

On completion of this course the students will be able to:

1. Describe the operation and control of various types of generation of electricity
2. Describe the principle of operation of electrical apparatus
3. Differentiate between single and three phase systems
4. Solve simple mathematical relationships related to electrical apparatus. Relate the applications of electronic devices and sensors in practical life.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTEE 15F2 500	CO1	**3**	**2**	**2**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**1**	**3**			
	CO2	**3**	**3**	**1**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**3**			
	CO3	**3**	**2**	**2**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**3**			
	CO4	**3**	**2**	**2**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**1**	**3**			

Course Contents:

UNIT-I: Introduction to Electrical Parameters [11hrs]

Concept of Alternating Voltage and Current, Sinusoidal functions-specifications, Phasor representation, concept of impedance, admittance, conductance and susceptance –series and parallel circuits of RLC. Concept of power and power factor. Kirchoff's laws and network solutions. Electromagnetic induction-laws, direction & magnitude of indused emf, mmf, permeability, reluctance and comparison of electric and magnetic circuits. Self and mutual inductance of a coil, coupling coefficients. Concept of energy storage in L & C, resonance between L &C. Generation of three phase voltages, star-Wye configurations, relation between line and phase quantities and expression for power.

UNIT-II: Electrical Apparatus [11hrs]

DC generator, DC motor- concept of force, torque and mechanical work. Single and three phase induction motors, shaded pole motor, universal motor, stepper motor: Basic construction, principle of operation and applications. Single and three-phase transformers: Principle, emf equation.

UNIT-III: Generation & Distribution: [10hrs]

Block diagram representation of generation, transmission and distribution.Current generation and transmission scenario,need for transmission at high voltage. Block diagram representation of thermal, hydel, nuclear, diesel and renewable power plants. Concept of smart-grid and role of ICT in smart-grid.

UNIT-IV: Tariff, Protective Devices and Sensors [10hrs]

Tariff schemes, basic concepts of domestic wiring and types, earthing, protective fuses, MCB. Sensors: pressure sensor, strain gage, proximity sensor, displacement sensor, rotary encoder and ultrasonic sensors (applications in relevant disciplines- ref to 8 and 9)

References:

1. Theodore Wildi,"Electrical Machines, Drives, and Power Systems",Pearson Education, 5th Edition, 2007
2. Hughes, "Electrical Technology", International Students 9th Edition, Pearson, 2005
3. Kulshreshtha C,"Basic Electrical Engineering"Tata McGraw Hill, 2nd Edition, 2011
4. Mittle V.N. and A. Mittal, "Basic Electrical Engineering" Tata McGraw Hill, 2nd Edition, 2005
5. Kothari D.P., L.J. Nagrath"Basic Electrical Engineering",Tata McGraw Hill, 2009

6. Robert L. Boylestad and Louis Nashelsky, "Introduction to Electricicty, Electronics and Electromagnetics" Prentice Hall, 5th edition, 2001
7. Introduction to smart grid: http://www.occ.ohio.gov/publications/electric/Smart_Grid_An_Introduction.pdf
8. Role of ICT in smart grid: http://users.atlantis.ugent.be/cdvelder/papers/2010/develder2010sgc.pdf

Course Code: BTIC15F2600	Indian Constitution and Professional Ethics	C	L	T	P	CH
Duration: 16 Weeks		2	1	1	0	3

Prerequisites:

Basics of Social Sciences

Course Objectives:

1. Discuss the Fundamental Rights, Duties and other Rights which is been given by our law.
2. Explain the practicality of Constitution perspective and make them face the world as a bonafide citizen.
3. Acquire knowledge about ethics and also know about professional ethics.
4. Explore ethical standards followed by different companies.

Course Outcomes:

1. Interpret the fundamental rights and human rights.
2. Explain the duties of a citizen and more importantly practice it in a right way.
3. Get exposed about professional ethics and know about etiquettes about it.
4. Acquire the knowledge of ethical standards of different companies which will increase their professional ability.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3	PS O4
BTIC15F2600	CO1						2		3				2	-	-	-	-
	CO2								3		3		2	-	-	-	-
	CO3	2					2		3		2		3	-	-	-	-
	CO4	2					2		3				2	-	-	-	-

Course Contents:

UNIT-I:Constitution of India : [13 hrs]

Definition,Making of Indian Constitution, Preamble to the Constitution of India, Fundamental Rights under Part III; Rights to Equality, Right to Freedom, Right against Exploitation, Rights to Freedom of Religion, Cultural and Educational Rights, Constitutional Remedies. Fundamental Duties of the Citizen, Significance and Charecteristics.Elements of National Significance; National Flag, National Anthem, National Emblem.

UNIT-II:Union and State : [10 hrs]

Organs of the Government; Legislature, Executive and Judiciary. Union and State Excecutives : President, Vice President, Prime Minister, Supreme Court, Cabinet, Governor, Councill of Ministers, Electoral process, Election Commission. Right to Information (RTI), Consumer and Consumer Protection.

UNIT III:Ethics: [13hrs]

Meaning, Definition, Evoltion, Need of ethics,Aristotlean Ethics, Utilitarianism, Katianism, Professional Ethics, Personal Ethics and Business Ethics, Ethical Standards, Duties of Employers and Employees.

UNIT IV:Engineering Ethics: [10hrs]

Definition Scope and needs, Ethics in Consumer Protection, Due Care theory, Environmental Ethics, Ethical Code of Conduct in ethics.Best Ethical Companiesin India and Abroad; Corporate Social Responsibilities,Code of Conduct and Ethical Excellence.

Reference books :

1. M V Pylee, An introduction to Constitution of India
2. M Govindarajan, S Natarajan, V S Senthil Kumar, Engineering

Course Code: BTCE15F2700	Communicative English	C	L	T	P	CH
Duration: 16 Weeks		2	1	1	0	3

Prerequisites:

Pre University English.

Course Objectives:

ls in English.

2. To emphasize specially the development of speaking skills amongst learners of Engineering and Technology.
3. To ensure that learners use the electronic media such as internet and supplement the learning materials used in the classroom.
4. To inculcate the habit of reading and writing leading to effective and efficient communication.

Course Outcomes:

1. Speak clearly, confidently, comprehensibly, and communicate with one or many listenersusingappropriate communicative strategies.
2. Write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide
3. Vocabulary range, organizing their ideas logically on a topic.
4. Read different genres of texts adopting various reading strategies.Listen/view and comprehend different spoken discourses/excerpts in different accents.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F2 700	CO1						3	2		3	3		3				
	CO2						3	3		3	3		3				
	CO3						3	2		3	2		3				
	CO4						3	3		3	3		3				

Course Contents:

UNIT-I: [7hrs]

Text Component: Lamb to the Slaughter -Roald Dahl, My Mother's Hands-Robert Fontaine, Communicative Component: ,E-Mail Etiquette: Objective, Drafting, Language, Presentation Skills.

UNIT-II: [7hrs]

Text Component: ,Poor Girl-Maya Angelou ,A Glowing Future -Ruth Rendell, Communicative Component**:** *Employment Related Communication***,** Curriculum vitae and cover letters, Facing interviews.

UNIT-III: [7hrs]

Text Component**:** A Story of an Hour -Kate Chopin;,Communicative Component: *Writing:*Note taking/Note making, Report writing, Persuasion skills.

UNIT-IV: [7hrs]

Text Component: La Belle Dame Sans Merci- John Keats,Communicative Component: **Oral** *Communication:* Understanding Communication-Greeting, Introducing one self – others –in formal and informal contexts , Making Requests, Asking for and Giving Permission, Offering Help, Giving Instructions and Directions.

Reference Books:

1. Murphy,Raymond, Intermediate English Grammar,New York1998.
2. Wren &Martin ,English Grammar & Composition, New York 2001.
3. Mudambadithaya G.S., English Grammar and composition 2002
4. Digne, Flinders and Sweeney Cambridge University press2010
5. Lupton, Mary Jane . Maya Angelou: A Critical Companion. Westport, Connecticut:Greenwood Press. ISBN 978-0-313-303225, 1998
6. Booher, Diana. , Booher's Rules of Business Grammar, OUP 2004
7. Ur, Penny ,Grammar Practice Activities, OUP 2002
8. Wren &Martin,English Grammar & Composition, New York 2001
9. Joan Van Emden and Lucinda Becker Palgrave. Effective Communication for Arts and Humanities Students. Macmillan.
10. Glendinning, Eric H. and Beverly Holmstrom, Study Reading: A Course in Reading Skills for Academic Purposes, New Delhi: CUP. 2008
11. Langan, John, College Writing Skills. McGraw Hills 1996.

Course Code: BTPL15F2800	**Engineering Physics Lab**	**C**	**L**	**T**	**P**	**CH**
Duration: 16 Weeks		**2**	**0**	**0**	**2**	**3**

Course Objectives:

1. To make the students gain practical knowledge of Physics to co-relate with the theoretical studies.
2. To provide students with a theoretical and practical knowledge of Physics.
3. To achieve perfectness in experimental Skills and the study of practical applications improve confidence and ability to develop and fabricate engineering and technical equipments.
4. Students should be getting idea of basic electronic circuits, optical instruments and will be able to carry out experiments in optics and verify other important laws of Physics.

Course Outcomes:

At the end of the course a students are able to

1. Develop skills to apply practical knowledge of Physics in real time solution.
2. To understand and verify different laws of Physics using some simple experiments.
3. To design simple electrical circuits and analyze obtained result. Ability to use the knowledge acquired for different applications and projects.
4. Ability to apply knowledge of basic electronics in making simple circuits using diodes and transistors and analyze the responses.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTEP 15F2 800	CO1	**3**	**3**		**1**									**3**	**3**	**3**	**3**
	CO2	**3**	**2**	**1**										**3**	**3**	**3**	**3**
	CO3	**3**	**2**					**1**						**3**	**3**	**3**	**3**
	CO4	**3**	**2**					**1**						**3**	**3**	**3**	**3**

Course Contents:

List of Experiments:

1. Determination of wavelength of the given laser using diffraction grating.

2. I-V characteristics ofZener-diode – (determination of knee voltage breakdown voltage and forward resistance).
3. Determination of Planck's constant using LED.
4. Determination of energy gap of a semiconductor.
5. Measurement of dielectric constant by charging and discharging method.
6. Determination of Fermi energy of copper.
7. I-V characteristics of NPN-Transistor in C-E mode. (Determination of knee voltage input resistance, output resistance, current gain and current amplification factor breakdown).
8. Photo diode characteristics (I-V characteristics in reverse bias, variation of photocurrent as a function of intensity and reverse voltage).
9. Determination of Young's modulus of the material by single cantilever method/uniform bending method.
10. Determination of resonant frequency, band width and quality factor of the given LCR series and parallel resonance circuits.
11. Determination of rigidity modulus of the material and moment of inertia of an irregular body using Torsional pendulum.
12. Measurement of numerical aperture and attenuation in optical fibers. (Demo Expt.)
13. Determination of electrical resistivity by four probe method. (Demo expt.)
14. Measurement of velocity of ultrasonics in the given liquid-acoustic grating method. (Demo Expt.)

Text Books:

1. C. L. Arora, "Practical Physics", S. Chand & Co., New Delhi, 3rd Edition, 2012.
2. Vijay Kumar, Dr. T. Radhakrishna, "Practical Physics for Engineering Students", S M Enterprises, 2nd Edition, 2014.

Reference Books:

1. C.F. Coombs,"Basic Electronic Instrument Handbook", McGraw-Hill Book Co., 1972.
2. C.H. Bernard and C.D. Epp, John Wiley and Sons, "Laboratory Experiments in College Physics" Inc., New York, 1995.

Course Code: BTEW15F2900	**Basic Electrical Engineering Lab and Workshop Practice**	**C**	**L**	**T**	**P**	**CH**
Duration: 16 Weeks		**2**	**0**	**0**	**2**	**3**

Prerequisites:

Basic Electrical and Electronics Engineering

Course Objectives:

1. To establish a broad concept of various types of electrical apparatus and instrumentation.
2. To provide hands on experience with electrical apparatus.
3. To train students to read and understand schematics so as to make connection.
4. To train students in collecting and interpreting experimental data.

Course Outcomes:

1. Recognize various symbols in a schematic and make connection as per the schematic
2. Make use of various measuring instruments to collect experimental data
3. Relate experimental results with theoretical analysis.
4. Demonstrate the ability to critically evaluate the performance of an electrical apparatus.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTEW 15F2 900	CO1	**3**	**2**	**2**	**2**		**1**						**1**	**3**			
	CO2	**3**	**3**	**1**	**2**		**1**							**3**			
	CO3	**3**	**2**	**2**	**1**		**1**							**3**			
	CO4	**3**	**2**	**2**	**2**		**1**						**1**	**3**			

Course Contents:

List of experiments -Electrical

1. Electronic tools introduction: ammeter, voltmeter, CRO.(demo)
2. Home electrical wiring demonstration: energy meter, MCB, tube light wiring.
3. Study of mutual induction effect.
4. Home electrical wiring demonstration: short circuit, series and parallel operation of load.
5. Electrical safety training: electrical activities to avoid shocks and importance of earthing, role of fuse, working of MCB.
6. Single phase transformer: study of polarity, turns ratio, losses, open circuit and closed circuit test
7. Diode rectifier applications: half wave & full wave rectifier, ripple factor calculations.
8. Thyristor applications: half wave & full wave rectifier (demo)
9. Sensor experiments: ultrasonic sensor, pressure sensor, LDR, opto coupler.

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WORKSHOP PRACTICE	
Objectives	1. To train students in metal joining process like welding, soldering etc. 2.To impart skill in fabricating simple components using sheet metal.

	3.To cultivate safety aspects in handling of tools and equipment.
Expected outcome	On completion of this course, the students will be able to 1.Welding and soldering operations. 2.Fabrication of simple sheet metal and wood parts.
Course Contents:	
UNIT-I	Welding Shop
1.Instruction of standards and reading of welding drawings. 2.Making Butt joint, Lap joint, Corner joint.	
UNIT-II	Sheet Metal and Soldering shop
1.Making of Cube, Prism, Cone, Cylinder, Funnel using development of lateral surfaces. 2. Instruction of standards and reading of soldering tools. 3.Soldering of sheet metal models.	
UNIT-III	Fitting/Carpentering
1.Introduction to Fitting tools. 2.Making V Joint, Square Joint. 3.Introduction to carpentry tools. 4.Making T Joint, Dovetail Joint.	
UNIT-IV	BOSCH Tools
1.Demonstration of all BOSCH tools and their applications.	

Text Books:

Workshop Manual Prepared by REVA University Staff	
Mode of Evaluation	Tutorials/Class Tests/Lab exam

BTCE15F3100	**Engineering Mathematics -III**	**L**	**T**	**P**	**C**	**Hrs/Wk**
Duration :16 Wks		**3**	**1**	**0**	**4**	**5**

Prerequisites:

BTCE15F1100, BTCE15F2100

Course Objectives:

To study and understand the application approach of the concepts of Numerical methods, curve fitting, and statistics.

Course outcomes:

At the end of the course the students would

1. Be capable of mathematically formulating certain practical problems.
2. Recognize and understand the methodologies of various numerical techniques and associated error estimation analysis.

3. Understand the importance of statistical analysis in engineering and other fields, the nature of uncertaintly and the concept of propability, numerical techniques for solving first-order differential equations.

4. Be able to solve the problems in dynamics of rigid bodies, optimization of orbit's and vibration problems.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F3 100	CO1	3	3	2	2	1	1							3	1	1	1
	CO2	3	3	2	2	1	1							3	1	1	1
	CO3	3	2	1	3	2	1							3	1	1	1
	CO4	3	2	2	2	2	1							3	2	1	1

UNIT - I: Numerical Methods

Introduction, solution of algebraic and transcendental equation, Bisection method, Regula false method.

Finite differences and Interpolation :-Forward and Backward differences , Newton's forward and Backward interpolation formulae, Divided differences-Newton's divided difference formula, Lagrange's Interpolation formula and Inverse Interpolation formula and Problems.

UNIT-II: Curve Fitting

Introduction, graphical Method, Principles of Least Squares, Method of Least squares, fitting of other curves, Methods of group averages, fitting a parabola, Method of Moments

UNIT-III: Probability and Information Theory:

Introduction, Principal of counting, and combinations, basic terminology, definition and probability, set notations. Addition law of probability, independent events, multiplication law of probability, Baye's Theorem, Random variables, Discrete Probability distribution, continuous probability distribution, Expectation, variance, Moments generating functions, Probability generating functions, repeated trials, Binomial distribution, Poisson Distribution, Normal Distribution.

UNIT-IV: Sampling and inference:

Introduction, sampling distribution, standard error, testing of hypothesis, errors, level of significance, tests of significance, confidence limits, simple sampling of attributes, test of significance for large samples, comparison of large samples, sampling of variables, central limit theorem, confidence limits, test of significance for means of two large samples, sampling variables, student-t- distribution, significance test of a sample mean, significance test of difference between sample means, chi-square test, goodness of fit.

Text Books:

1. B.S.Grewal, "Higher Engineering Mathematics" Khanna Publishers, latest edition
2. Erwin Kreyzig, "Advanced Engineering Mathematics", Wiley Pub lications, Latest edition

Reference Books:

1. B.V.Ramana, Higher Engineering Mathematics", Ist edition, Tata McGrraw Hill Publications,2010
2. R.K.jain and S.R.K.Iyengar, "Advanced Engineering Mathematics" ,Narosa Publishing House, 4th Edition

BTCE15F3200	Building Materials & Construction Technology	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

None

Course Objectives:

1. To learn about types of bricks, stones, cement and Concrete
2. To understand about types of foundations and brick and stone masonry.
3. To know about the lintels, stairs, roofs, doors and windows.
4. To understand the concepts of flooring and plastering.

Course Outcomes:

1. To identify the types of foundations and construction process.

2. To assess the different types of members of structures.
3. To Provide Suitable doors and windows
4. To carry out the Suitable type of paints.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F3 200	CO1	3	1	2	1					2	2		2	3	1	2	2
	CO2	3	1	2	2					2	2		3	3	1	2	2
	CO3	3	2	3	1					2	2		2	3	1	2	2
	CO4	3	2	3	1					2	2		3	3	1	2	2

Course contents

UNIT1: Foundation and Masonry

Function and requirements of a good foundation, Types of foundations, Preliminary investigation of soil, Safe Bearing Capacity of Soil, Introduction to spread, combined, strap, mat and pile foundations. (Basic Concepts and Sketches only)

Classification of Masonry, Definition of terms used in Masonry, Introduction to classification and qualities of bricks, Bonds in Brick work - English Bond, Flemish Bond, Reinforced Brick Masonry, Common building stones, their properties and uses, Classification of stone masonry, Joints in stone masonry, load bearing, cavity and partition walls.

UNIT2: Arches, Lintel, Balcony, Roofs and Floors

Elements of an arch, Classification of arches, Definition and classification of Lintels, Definition and functions of Chejja, Canopy & Balcony. Types of Roofs & Roofing materials, Flat roof (RCC), Types of pitched roofs, Wooden truss, Steel truss, Types of flooring, Factors affecting selection of flooring materials. (Classification and sketches only)

UNIT3: Doors, Windows , Stairs and plastering

Location of doors and windows with a plan of typical residential building (line diagram only), Definition of technical terms, Types of Doors, Types of windows, Varieties of materials for doors and windows & properties of wood. Definition of technical terms related to stairs, Types of Stairs, Geometrical design of RCC Dog legged and open well stairs (Plan and sectional elevation).Purpose of plastering, Materials of plastering, Methods of plastering, Defects in plastering,

UNIT4: Painting and Miscellaneous topics

Types of Paints, Constituents of paints, Purpose of Painting, Defects in Painting, Application of Paints to new and old surfaces.

Properties and uses of plastics, aluminum, glasses, varnishes, Introduction to smart materials and its application, Introduction to formwork and scaffolding, Formwork details for RCC Column, Beams and Floors, Shoring and under pinning, Damp Proofing - Causes of Dampness, Effects of Dampness, Methods of Damp Proofing

REFERENCE BOOKS

1. Rangawala P.C, Engineering Materials, Charter Publishing House, Anand, India.
2. Sushil Kumar, Engineering Materials, Standard Publication and Distributors, New Delhi.
3. M..S. Shetty, S. Chand and Co, Concrete technology – Theory and practice, New Delhi, 2002.
4. P.G. Varghese,A Text Book Building Materials, Prentice-Hall of India Pvt. Ltd., Publication.
5. Mohan Rai and M.P. Jain Singh, Advances in Building Materials and Construction publication by CBRI, Roorkee.
6. byNeville A.M and Brooks J.J , Concrete Technology ELBS Edition, London
7. byGambhir M.L, Concrete Technology–Dhanpat Rai and Sons, New Delhi.
8. C B Kukreja and Ravi Chawla, Material Testing Laboratory Manual by Standard Publishers Distributors, New Delhi.
9. H.M. Raghunath, Strength of Materials Lab Testing, Theory & Problems, New Age International (P) Ltd, 2010, New Delhi.

BTCE15F3300	**Engineering Earth Science**	**L**	**T**	**P**	**C**	**Hrs/Wk**
Duration :16 Wks		**2**	**1**	**0**	**3**	**4**

Course Prerequisite: PUC with Science

Course Learning Objectives:

- To learn about Geomorphology and interior of the Earth.
- To study the origin, properties and uses of minerals.
- To study the origin, properties and uses of rocks.
- To study the causes and effects of earth quakes.
- To understand the various structures developed in rocks.
- To know the Geological details in the selection of dam and tunnel sites.
- To study the groundwater formation, exploration and exploitation.
- To study the Geomatics and its applications in the field.

Course Outcome:
At the end the course the students

1. Students will have knowledge about Engineering properties of Rocks and their Minerals.
2. Student will be appraised about Dam, reservoir, tunnel
3. Student will understand about Earthquake phenomena.
4. Student will able to carry out Physical exploration CE304.5 Student will able to estimate various geological parameters by use of modern tools & techniques

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F3 300	CO1	3	1	2	1					2	2		2	3	1	2	2
	CO2	3	1	2	2					2	2		3	3	1	2	2
	CO3	3	2	3	1					2	2		2	3	1	2	2
	CO4	3	2	3	1					2	2		3	3	1	2	2

Course Contents:

UNIT-I: **12hrs**

Introduction: Role of Earth Science in Civil Engineering Practices, Understanding the earth, interior of the earth, composition and density of crust, mantle and core layers.

Mineralogy: Quartz Group (Glass); Feldspar Group (Ceramic wares and Flooring tiles); Kaolin (Paper, paint and textile); Asbestos (AC sheets); Carbonate Group (Cement) ; Gypsum (POP, gypsum sheets, cement); Mica Group (Electrical industries); Ore minerals - Iron ores (Steel); Chromites (Alloy); Bauxite (aluminum); Chalcopyrite (copper). Mineral properties, composition and uses, in the manufacture of construction materials of above minerals.

Petrology: Strength Characteristics of rocks - Compressive, Tensile and Shear strengths and Hardness. Formation, Classification of Engineering properties and uses of rocks in construction : Igneous Rocks - Granite, Dolerite, Gabbro, Basalt; Sedimentary rocks - Sandstone, Shale, Limestone, Laterite; Metamorphic rocks - Gneiss, Quartzite, Slate, Charnockite: Decorative stones - Porphyries, Marble and Quartzite.

UNITII:12hrs

Geomorphology: Geomorphological agents: River valley, Drainage development and patterns; Coastlines and their engineering considerations , deserts and its features. Rock weathering and its effect on Civil Engineering projects;

Seismology: Introduction, seismic waves, Engineering problems related to Earthquakes, Earthquake intensity, causes and effects, Seismograph: , Seismic zones- World and India, Tsunami. Reservoir Induced Seismicity, Plate Tectonics.

Unit-III: 12hrs

Rock Mechanics: Concept of stress and strain, deformation of rocks, Development of Joints, Folds, Faults and Unconformity and their impact on the selection of sites for Dams, Reservoirs, Tunnels, Highways and bridges.

Construction Materials: Introduction, Selection of good quality rocks based on geological and engineering properties for use in the construction of Dams, Roads, Railway lines; Flooring slabs, Masonry, aggregates; Decorative stones-Colour, texture, hardness and durability.

Unit -IV: **12hrs**

Hydrogeology: Hydrological cycle, Occurrence of Groundwater in different terrains - Weathered, Hard and Stratified rocks. Groundwater pollution, Groundwater Exploration- Electrical Resistivity Method, Resistivity curves, Aquifer and its types, Springs and Artesian Wells, Rain water harvesting and recharge of Groundwater, Sea water intrusion and remedies.

Toposheets and Geological Maps: Study of Toposheets, Geological maps, Use of maps in Civil Engineering, Disaster Management – types of Disasters early warning system and their mitigation.

References:

1) Principles of Engineering Geology and Geotechnics by Dimitri P Krynine and William R Judd, CBS Publishers and Distributors, New Delhi.
2) Earthquake Tips - Learning Earthquake Design and Construction by C V R Murthy Published by National Information Centre of Earthquake Engineering, Indian Institute of Technology, Kanpur.
3) Bureau of Indian Standards, IS: 1893, IS: 4326, IS: 13827, IS: 13828, IS: 13920, IS: 13925, IS: 15662-2006.
4) Principles of Engineering Geology by K V G K Gokhale, BS Publications, Hyderabad
5) Fundamentals of Geology by A B Roy, Narosa Publishing House, New Delhi
6) Text book of Remote Sensing and Geographical information System by M Anji Reddy, BS Publications, Hyderabad
7) Physical Geology by Arthur Holmes, Tata Mac Grow Hill, New Delhi
8) Ground Water by K. Todd, Tata Mac Grow Hill, New Delhi
9) Structural Geology by M P Billings, CBS Publishers and Distributors, New Delhi
10) Engineering Geology by D. Venkata Reddy, New Age International Publications, New Delhi

BTCE15F3400	Surveying	L	T	P	C	Hrs/Wk
Duration:16 Wks		2	1	0	3	4

Prerequisites:

Basic Mathematics, and Basic science

Course Objectives:

1. To provide basic knowledge about principle of surveying for location, design and construction of engineering projects and also study about chain and compass surveying.
2. To develop skills for using surveying instruments including levelling instruments, plane tables etc.
3. To develop skills for using theodolite instruments to find horizontal and vertical angles and determine the elevation and distances.
4. To make students to set out various types of curves.

Course Outcomes:

1. Gain the basic surveying and application of chain and compass surveying for various different conditions.
2. Gained the ability to use plane table and levelling equipment with their accessories and to meet various requirements.
3. Gain the ability to use of theodolite to measure angles, elevation and distances.
4. Set out horizontal and vertical curves for various engineering projects.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F3 400	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	-	-	-	-	-	-	-	3	3	3	3	3

	CO4	**3**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**3**	**3**	**3**	**3**	**3**

UNIT – I: Introduction to Surveying

Importance of surveying to Civil Engineering – Definition– Classification– Concepts of plane and geodetic surveying – Principles of surveying –Plans and maps – Surveying equipments, their type and uses (Chain, Tape, Ranging rod, Cross staff, Optical square, Prism square, Offset rod) – Obstacles in chain surveys. Meridians, Bearings, Dip, Declination, Local attraction - Chain & Compass traverse, Local attraction, Calculation of bearings and included angles with numerical examples

UNIT – II: Plane Table Surveying and Levelling

Plane table surveying – Methods of plotting – Radiation, Intersection, Traversing and Resection – Two and Three point problem and solutions

Levelling – Principles and basic definitions – Types of Levels – Types of adjustments and objectives – Types of levelling – Simple, Differential, Fly, Reciprocal, Profile, Cross sectioning – Booking of levels – Rise & fall and H. I methods – Contours and their characteristics – Methods of contour plotting – Interpolation – Grade contour – application of contours. Numerical examples on levelling and calculation of reservoir capacity,.

UNIT – III: Theodolite Survey, Trignometric Levelling and Tacheometry

Theodolite – Types of adjustments and objectives - Horizontal and Vertical angle measurements by repetition and reiteration – Trigonometric levelling - Single and Double plane for finding elevation of objects – Application of tacheometry– Finding constants K & C – Computation of distances and elevations using Tacheometric methods, only concepts.

Calculation of areaand Volumes- calculation of area using cross staff surveying-coordinates method -Simpson's and Trapezoidal rules and use of Digital Planimeter-Measurement of volume by Trapezoidal and Prismoidal formula – Volume calculation from spot levels and contour plans. Problems on Railway and Highway embankments.

UNIT – IV : Curves

Simple curve-Elements of simple curves, Designation of a curve, setting out simple curve by offsets from long chord and offsets from chords produced, Setting out simple curve by Rankine's method, Numerical problems. Compound Curve- Tabulation and setting out of compound curve, Reverse curve, transition curve, combined curve and vertical curves, numerical examples.

Text Books:

1.Punmia B C., "Surveying", Vol. 1 & 2, Laxmi Publications Pvt. Ltd., New Delhi. 2009

2.T P Kanetkar & S P Kulkarni., "Surveying", Vol. 1 & 2, Tata McGraw Hill Publishing Co. Ltd, New Delhi. 2009.

Reference Books:

1.S K Roy, "Fundamentals of Surveying", Prentice Hall of India, New Delhi. 2009

2.S K Duggal, "Surveying", Vol. 1, Tata McGraw Hill Publishing Co. Ltd., New Delhi. 2008.

3.M. Chandra, "Plane Surveying"– New age international (P) Ltd.

BTCE15F3500	Strength of Materials	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Applied Physics, and Engineering Mechanics.

Course Objectives:

1. About the basic concepts of simple stresses, strains and elastic constants, composite bars and temperature stresses in simple and compound bars.
2. About bending moment and shear force of various beams
3. About bending and shear stresses in beams subjected to simple bending and deflections in loaded statically determinate beams
4. About torsional stress induced in circular members and critical buckling load of prismatic columns with different end conditions.

Course Outcomes:

1. To has the concepts of simple stresses, strains and elastic constants and able to analyse stresses in composite bars and temperature stresses in simple and compound bars.
2. To compute shear force and bending moment of different types of loadings of various beams
3. To compute bending and shear stresses in beams subjected to simple bending slope and deflection in loaded statically determinate beams
4. To compute torsional stress induced in circular members and critical buckling load of prismatic columns with different end conditions.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F3 500	CO1	3	3	1	1	1	2	1		1	2		3	3	3	3	2
	CO2	3	3	1	2		2	1		1	2		3	3	3	3	2
	CO3	3	3	2	2	2	2	1		1	2		3	3	3	3	2
	CO4	3	3	2	2	2	2	1		1	2		3	3	3	3	2

Course Contents:

UNIT 1: Simple Stresses and Strains:
Introduction, Properties of Materials, Stress, Strain, Hooke's law, Poisson's Ratio, Stress–Strain Diagram for structural steel and non ferrous materials, Principle of superposition, Total elongation of tapering bars of circular and rectangular cross sections, volumetric strain, expression for volumetric strain, Elastic constants, Relationships among elastic constants, Stresses in composite bars, Thermal stresses in simple and compound bars.

UNIT 2:Bending moment , shear force and deflections in beams
Introduction, Types of beams, loadings and supports, Shearing force, Bending moment, Sign convention, Relationships among loading intensity, shear force and bending moment, Shear force and bending moment equations and diagrams for cantilever beams, simply supported beams and overhanging beams considering point loads, UDL, UVL and Couples.
Deflection of beams
Introduction – Definition of slope, deflection and elastic curve, Derivation of differential equation of flexure (Euler-Bernoulli equation), Sign convention, Slope and deflection of statically determinate beams by the method of singularity functions(Macaulay's method).

UNIT 3: Compound Stresses , Bending and shear stresses in beams
Compound Stresses: Introduction, Stress components on inclined planes, General two dimensional stress system, Principal planes and stresses.
Introduction – Bending stress in beam, Assumptions in simplebending theory, Simple bending equation, section modulus, Flexural rigidity, Modulus of rupture. Expressionfor horizontal shear stress in beam, Shear stress diagram for homogeneous rectangular,symmetrical 'I' and 'T' beam sections.
UNIT 4:Torsion of circular shafts:
Introduction – Pure torsion-torsion equation of circular shafts, Strength and stiffness, Torsional rigidity and polar modulus, Powertransmitted by shaft of solid and hollow circular sections.
Elastic stability of columns:
Introduction – Short and long columns, Euler's theory on columns, Effective length, slenderness ratio, buckling load, Assumptions and derivation of Euler's Buckling load for different end conditions, Limitations of Euler's theory.

TEXT BOOKS:

1. Beer & Johnston, Mechanics of Materials
2. James M. Gere, Mechanics of Materials, (5th Edition), Thomson Learning
3. Singer, Strength of Materials, Harper and Row Publications.
4. Timoshenko and Young, Elements of Strength of Materials, Affliated East-West Press.

REFERENCE BOOKS:

1. Basavarajaiah and Mahadevappa, Strength of Materials, University Press (2009).
2. B.C Punmia Ashok Jain, Arun Jain, Mechanics of Materials, Lakshmi Publications, New Delhi.
3. Subramanyam, Strength of Materials, Oxford University Press, Edition 2008

BTCE15F3600	Fluid Mechanics	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Applied Physics

Course Objectives:

1. Understand the flow of fluids in motion, kinematics and dynamics, its properties and familiarize with Bernoulli's Energy Equation and Venturimeter.
2. Understand the types of losses in pipe flow, estimate the major loss and minor loss due to sudden expansion and pipe networks.
3. Understand various types of notches and weirs and their applications and estimate the flow of fluid in channels.
4. Learn the geometric properties and designing of open channels to carry uniform flow and for most economical conditions of channels

Course Outcomes:

1. Know the types of flow of fluids in motion, kinematics and dynamics, its properties and solve the numerical with Bernoulli's Energy Equation and Venturimeter.
2. Know about the types of losses in pipe flow, estimate the major loss and minor loss due to sudden expansion and pipe networks.
3. Know various notches and weir and their applications in estimating the flow of fluid in channels.
4. Know the geometric properties and designing of open channels to carry uniform flow and conditions for most economical channels.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3	PS O4
BTCE 15F3 600	CO1	3	3	2	3	3	-	3					3	3	3	3	3
	CO2	3	3	2	3	2	-	3					3	3	3	3	3
	CO3	3	3	2	2	2	-	2					3	3	3	3	3
	CO4	3	3	2	2	2	-	2					3	3	3	3	3

Course Contents:

UNIT-1: BASIC PROPERTIES OF FLUIDS

Introduction, Definition of Fluid, Systems of units, properties of fluid: Mass density, Specific weight, Specific gravity, Specific volume, Viscosity, Cohesion, Adhesion, Surface tension,& capillarity. Newton's law of viscosity (theory & problems).Capillary rise in a vertical tube and between two plane surfaces (theory only).

PRESSURE AND ITS MEASUREMENT

Definition of pressure, Pressure at a point, Pascal's law, Variation of pressure with depth. Types of pressure. Vapour pressure. Measurement of pressure using simple, differential & inclined manometers (theory & problems). Introduction to Mechanical and electronic pressure measuring devices. .

HYDROSTATIC PRESSURE ON SURFACES

Basic definitions, equations for hydrostatic force and depth of centre of pressure for Vertical and inclined submerged laminae (plane and curved) - Problems.

UNIT-2: KINEMATICS OF FLOW

Introduction, methods of describing fluid motion, definitions of types of fluid flow, streamline, path line, stream tube. Three dimensional continuity equation in Cartesian Coordinates (derivation only). General Continuity equation (problems). Velocity potential, Stream function, Equipotential line, Stream line- problems, Physical concepts of Stream function. Introduction to flow net.

DYNAMICS OF FLUID FLOW

Introduction, Energy possessed by a fluid body. Euler's equation of motion along a streamline and Bernoulli's equation. Assumptions and limitations of Bernoulli's equation. Momentum equation problems on pipe bends.

UNIT-3: PIPE FLOW

Introduction, losses in pipe flow, Darcy-Weisbach equation for head loss due to friction in a pipe. Pipes in series, pipes in parallel, equivalent pipe, pipe networks-problems. Minor losses in pipe flow, equation for head loss due to sudden expansion- problems.

UNIT-4: UNIFORM FLOW IN OPEN CHANNELS

Introduction, Geometric properties of Rectangular, Triangular, Trapezoidal and Circular channels. Chezy's equation, Manning's equation-problems. Most economical open channels-Rectangular, Triangular, Trapezoidal and Circular channels- problems.

TEXT BOOKS:

1. R.K.Rajput, S.Chand & Co, 'A Textbook of Fluid mechanics & Hydraulic Machines'-, New Delhi, 2006.
2. N.Narayana Pillai, 'Principles of Fluid Mechanics and Fluid Machines'- Universities Press (India), Hyderabad, 2009 Edition.
3. Madan Mohan Das, 'Fluid Mechanics and Turbomachines'- PHI Learning Pvt. Limited, New Delhi. 2009 Edition.

REFERENCE BOOKS:

1. Bruce R. Munson,Donald F.Young, Theodore H. Fundamentals of Fluid Mechanics' –Okiishi, Wiley India, New Delhi, 2009 Edition.
2. Edward j.Shaughnessy, jr; Ira m. Katz 'Introduction To Fluid Mechanics' –:; James p Schaffer, Oxford University Press, New Delhi, 2005 Edition.
3. R.K.Bansal, 'Text Book Of Fluid Mechanics& Hydralic Machines'- Laxmi Publications, New Delhi, 2008 Edition.
4. Streeter, Wylie, 'Fluid Mechanics' –Bedford New Delhi,2008(Ed)

BTCE15F3700	Basic Material Testing Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Building Materials and Strength of Materials.

Course Objectives:

1. Ability to apply knowledge of mathematics and engineering in calculating the mechanical properties of structural materials
2. To provide an opportunity to learn how to measure hardness of ferrous and non-ferrous materials.
3. To study the behaviour of mild steel under impact load, torsion, tension, compression and shear.
4. To study the behaviour of wood under compression and bending.

Course Outcomes:

1. Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion.
2. Measure the hardness of ferrous and nonferrous metals.
3. Identify, formulate and solve engineering problems of structural elements subjected to flexure.
4. Analyse the behaviour of wood under compression and bending test.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F3 700	CO1	3	3	2	1	1	1			1	2	2	2	3	2	2	2
	CO2	3	2	1	2	1	2			1	2	3	2	2	3	2	2
	CO3	3	2	1	2	1	2			1	2	3	2	2	3	2	2
	CO4	3	2	1	2	1	2			1	2	3	2	2	3	2	2

Laboratory Experiments:

1. Tension test on Mild steel and HYSD bars.
2. Compression test of Mild Steel, Cast iron and Wood.
3. Torsion test on Mild Steel circular bar
4. Bending Test on Wood under two point loading
5. Shear Test on Mild steel.
6. Impact Test on Mild Steel (Charpy & Izod)
7. Tests on Bricks and Tiles
8. Tests on Fine aggregates – Moisture content, Specific gravity, Bulk density, Sieve analysis and Bulking
9. Tests on Coarse aggregates – Absorption, Moisture content, specific gravity, Bulk density and Sieve analysis.
10. Demonstration of Strain Gauges.

Reference Books:

1. Davis, Troxell and Hawk, Testing of Engineering Materials, International Student Edition – McGraw Hill Book Co, New Delhi.
2. Fenner, Mechanical Testing of Materials, George Newnes Ltd. London.
3. Holes.K.A, Experimental Strength of Materials, English Universities Press Ltd. London. Relevant IS Codes.
4. M.L.Gambhir, Concrete Manual, Dhanpat Rai & Sones, New Delhi.

BTCE15F3800	Surveying Practice Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Applied Surveying

Course Objectives:

1. To understand basics of linear and angular measurements in field using surveying equipment's.
2. To use compass for setting out of various civil engineering works involving linear and angular measurements.
3. Levelling techniques and contour map development.
4. To set out simple and compound curves by different methods.

Course Outcomes:

1. Develop skills of using instruments for distance measurement and angular measurements.
2. Develop skills to use theodolite for horizontal and vertical angle measurements.
3. Develop skill to measure distance and angle by single plane and double plane methods.
4. Develop skill to setting out simple and compound curves by different methods.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F3 800	CO1	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO2	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO3	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO4	**3**	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**3**	**3**	**3**	**3**	**3**

LIST OF PRACTICALS:

1. To measure distance between two points using direct ranging, to set out perpendiculars at various points on given line and thus to calculate the area of a plot by cross-staff survey.
2. Measurement of bearing of the sides of a closed traverse using prismatic compass.
3. To locate points using Radiation and Intersection method of plane tabling and to solve 3-point problem in plane tabling using Bessel's graphical solution.
4. To determine difference in elevation between two points using fly levelling & to conduct Fly back levelling to check the accuracy of levelling work. Booking of levels using both H I & Rise and fall methods.
5. To conduct profile levelling for water supply/sewer line and to draw the longitudinal section to determine the depth of cut/fill for a given gradient.
6. Measurement of horizontal angles using method of Repetition and reiteration & measurement of vertical angles using Theodolite.
7. To determine the distance & elevation of an object using single plane and double plane methods.

Text Books:

1. Punmia B C., "Surveying", Vol. 1 & 2, Laxmi Publications Pvt. Ltd., New Delhi. 2009
2. T P Kanetkar & S P Kulkarni., "Surveying", Vol. 1 & 2, Tata McGraw Hill Publishing Co. Ltd, New Delhi. 2009.

Reference Books:

1. S K Roy, "Fundamentals of Surveying", Prentice Hall of India, New Delhi. 2009
2. S K Duggal, "Surveying", Vol. 1, Tata McGraw Hill Publishing Co. Ltd., New Delhi. 2008.

A. M. Chandra, "Plane Surveying"– New age international (P) Ltd.

SYLLABUS IV SEMESTER

BTCE15F4100	Concrete Technology & Alternative Building Materials	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Civil engineering materials and Engineering Construction.

Course Objectives:

1. To learn about different alternative building materials and its characteristics
2. To understand about properties of lime-pozzolana cements
3. To know the factors and properties of structural masonry and equipment for the production of alternative materials.
4. To understand the different alternative building technology and cost effective building design.

Course Outcomes:

1. Have learnt about different alternative building materials.
2. Be able to understand properties of lime-pozzolana cements.
3. Be able identify the equipment's for the alternative building materials.
4. Able to explain the different technology and their design.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F4 100	CO1	3	3	1										3	2	1	1
	CO2	3	2	1										3	1	1	1
	CO3	3	3	2	3									3	3	3	2
	CO4	3	3	3	2									3	3	3	1

Course Contents:

UNIT1:Cement and Aggregates:

Cement and aggregates, Chemical composition, hydration of cement, Types of cement, manufacture of OPC by wet and dry, process (flow charts only) .Testing of cement and grades of cement, Quality of mixing water. Fine aggregate testing, deleterious materials. Coarse aggregate – Importance of size, shape and texture. Grading of aggregates - Sieve analysis, specific gravity, Flakiness and elongation index, crushing, impact and abrasion tests.

UNIT :Properties of concrete:

Workability - factors affecting workability, Measurement of workability, Segregation and bleeding, Process of manufactures of concrete: Batching, Mixing, Transporting, Placing, Compaction and Curing, RMC concrete.
Chemical admixture, Mineral admixtures, Factors affecting strength, w/c ratio, gel/space ratio, maturity concept, Effect of aggregate properties, relation between compressive strength, and tensile strength, bond strength, modulus of rupture, Accelerated curing, aggregate - cement bond strength, Testing of hardened concrete by various methods.
Elasticity - Relation between modulus of elasticity and Strength, factors affecting modulus of elasticity, Poisson's Ratio, Shrinkage and creep concepts only.

UNIT3:Durability of Concrete and mix design:
Durability - definition, significance, permeability, Sulphate attack, Chloride attack, carbonation, freezing and thawing, Factors contributing to cracks in concrete - plastic shrinkage, settlement cracks, construction joints, Thermal expansion, transition zone, structural design deficiencies.
Concept of Concrete Mix design, variables in proportioning, exposure conditions, Procedure of mix design as per IS 10262, Numerical examples of Mix Design**.**

UNIT4:Alternative building materials:
Energy in building materials, Environmental issues concerned to building materials, Global warming and construction industry, Environmental friendly and cost effective building technologies, Characteristics of building different blocks for wall, Alternative for wall construction, Types, Construction method, Masonry mortars,
Ferro-cement - materials, techniques of manufacture, properties and. Fiber reinforced concrete - Fibers types and properties, Self compacting concrete concept, materials, tests, properties, application and Typical mix.(theoretical concepts only). Nansu method of mix design for SCC (procedure only)

REFERENCE BOOKS:

1. M.S.Shetty, **Concrete Technology -Theory and Practice**, S.Chandand Company, New Delhi.
2. Neville, A.M **Properties of Concrete**, ELBS, London
3. A.R.Santhakumar, "**Concrete Technology**", Oxford University Press (2007)
4. N Krishnaraju, **Design of Concrete Mixes**, Sehgal Educational Consultants & Publishers Pvt. Ltd, Faridabad.
5. "**Recommended guidelines for concrete mix design**" - IS: 10262, BISPublication.
6. K.S. Jagadish, B.V.Venkatarama Reddy & K S NanjundaRao, Alternative building materials and technologies, New Age International Publishers Ltd, New Delhi.
7. Relevant IS Codes
8. Gambhir, M.L., Concrete Manual: Laboratory Testing for Quality Control of *Concrete*, 4th Edn., Dhanpat Rai and Sons, Delhi, 1992.

Sood, Hemant, Mittal L N and Kulkarni P D, **Laboratory Manual on Concrete Technology** CBS Publishers, New Delhi, 2002.

BTCE15F4200	Applied Surveying & GIS	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Basic Mathematics, and Basic science

Course Objectives:

1. To provide basic knowledge about principle of surveying for location, design and construction of engineering projects and also study about chain and compass surveying.
2. To develop skills for using surveying instruments including levelling instruments, plane tables etc.
3. To develop skills for using theodolite instruments to find horizontal and vertical angles and determine the elevation and distances.
4. To make students to set out various types of curves.

Course Outcomes:

1. Gain the basic surveying and application of chain and compass surveying for various different conditions.
2. Gained the ability to use plane table and levelling equipment with their accessories and to meet various requirements.
3. Gain the ability to use of theodolite to measure angles, elevation and distances.
4. Set out horizontal and vertical curves for various engineering projects.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O2	PS O3	PS O4
BTCE 15F4 200	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	-	-	-	-	-	-	-	3	3	3	3	3
	CO4	3	3	1	2	-	-	-	-	2	-	-	3	3	3	3	3

UNIT – I : Introduction

General requirements and specifications for engineering project surveys, reconnaissance. Preliminary and locations survey for highway, earthen bund and canals. (brief types and concepts only)

Setting out of Construction works-Setting out of a bridge, determination of the length of the central line and the location of piers, Setting out of a tunnel – surface setting out and transferring the alignment underground.

EDM: Principles of EDM's. Total Station-salient features and capabilities. Digital levels-salient features and capabilities.

UNIT – II: Hydrographic Survey and Aerial Photogrammetry

Hydrographic Survey- horizontal and vertical control. Soundings and location Shoreline and river survey, Methods of soundings, equipments, three point problem. Tidal and Stream Discharge measurement

Aerial Photogrammetry -Introduction, Principle, Uses, Aerial Camera, Aerial Photographs, Definitions, Scale of vertical and tilted photograph, ground co-ordinates, ground control procedure for aerial survey.

UNIT – III : **Remote Sensing and GPS**

Definition and concepts. Concept of signatures. Multi-spectral concept. Remote sensing systems. Remote sensors and platforms. Data products generation and analysis. Application of remote sensing in agriculture, water resources, wet land management, land cover/use mapping and forestry. Global Positioning System-Advantages of GPS, Components of GPS-Space, control and user segments. Relative and differential positioning. Factors affecting GPS, GPS applications.

Unit 4: GIS

Introduction to GIS, GIS terminology, concepts, Geographic data-data input, processing – data base structure-vector and raster data structure, database management-layer concepts, spatial manipulation and analysis and graphical output and visualization.

Use of GIS in Management and monitoring of land, air, change detection, water and pollution studies, conservation of resources, geological applications, coastal zone management - Limitations.

Text Books:

1. Punmia B C., "Surveying", Vol. 1 & 2, Laxmi Publications Pvt. Ltd., New Delhi. 2009

2. T P Kanetkar & S P Kulkarni., "Surveying", Vol. 1 & 2, Tata McGraw Hill Publishing Co. Ltd, New Delhi. 2009.

3.Anji Reddi, "Remote Sensing and GIS", BS publications, 2001

Reference Books:

1. S K Roy, "Fundamentals of Surveying", Prentice Hall of India, New Delhi. 2009

2.S K Duggal, "Surveying", Vol. 1, Tata McGraw Hill Publishing Co. Ltd., New Delhi. 2008.

3.M. Chandra, "Plane Surveying"– New age international (P) Ltd.

BTCE15F4300	Building Planning & Drawing	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	2	0	3	5

Prerequisites:

Prerequisite: Building Material and Construction Technology

Course Objectives:

1. Preparation of drawings of building components
2. Functional design of buildings (residential, public and industrial)
3. Development of plan, elevation and sectional views, water supply, sanitary and electrical layouts of residential buildings given line diagram.
4. To develop line diagrams for non-residential buildings

Course Outcomes:

1. Able to prepare drawings of building components
2. Able to carry out functional design of buildings (residential, public and industrial)
3. Able to develop plan, elevation and sectional views of residential buildings given line diagram. To prepare water supply, sanitary and electrical layouts.
4. Able to develop line diagrams for non-residential buildings Using drafting software.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F4 300	CO1	3	2	2						2			3	3	3	3	3
	CO2	3	2	3	2					2			3	3	3	3	3
	CO3	3	2	3	2					2			3	3	3	3	3
	CO4	3	2	3	1					2			3	3	3	3	3

Course Contents:

UNIT-1

Preparation of geometrical drawing of components of buildings i) Stepped wall footing and isolated RCC column footing, ii) Fully paneled and flush doors, iii) Half-paneled and half-glazed window, iv) RCC dog legged and open well stairs, v) Steel truss.

UNIT-2

Functional design of building (Residential, Public and Industrial), positioning of various components of buildings, orientation of buildings, building standards and bye-laws, set back distances and calculation of carpet area, plinth area and floor area ratio.

UNIT-3

Development of plan, elevation, section and schedule of openings from the given line diagram of residential building: i) Two bed room building, ii) Two-storeyed building.

Preparation of water supply, sanitary and electrical layouts for a given single line diagram.

UNIT-4

Functional design of buildings using inter-connectivity diagrams (bubble diagram), development of line diagram for following buildings i) Primary health centre, ii) Primary school building, iii) College canteen iv) Office building.

Note: The drawings shall be prepared using AUTOCAD or any other drafting software.

Examination & Evaluation:

1. Based on manual drawing practice & submission of drawing sheets of Unit I & Unit-II C1 Assessment has to be done.
1. Based on manual drawing practice & submission of drawing sheets of Unit III & Unit-IV C2 Assessment has to be done.
2. C3 examination must be with Auto CAD 3hours lab examination for UNIT-III & UNIT-IV only (TWO problems must be given one from UNIT-III (35 Marks) , One from UNIT-IV 15 Marks . UNIT-III (Plan – 10 marks, front elevation- 5 marks, Sectional elevation – 10 marks , dimensioning – 5 marks and Schedule of openings – 5 marks)

REFERENCE BOOKS:

1. Shah M.H and Kale C.M, **Building Drawing**, Tata Mc-Graw Hill Publishing co. Ltd., NewDelhi.
2. Gurucharan Singh, **Building Construction,** Standard Publishers &distributors, New Delhi.
3. **National Building Code**, BIS, New Delhi.
4. 4. N.Kumarswamy and A. Kameswara Rao, **Building Planning And Drawing,** Chartor Publishing House Pvt. Ltd.
5. Dr.*Balagopal and T.S.Prabhu*, ***Building Drawing and Detailing*** - *Spades Publishers*, Calicut.

BTCE15F4400	Water Supply Engineering & Introduction to EIA	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Water and Waste Water Engineering

Course Objectives:

1. Identify the various Water sources, water borne diseases, types of pumps for rural water supply and Water treatment methods to control contamination of water.
2. Describe Principles of rural sanitation and rain water harvesting.
3. Identify the Methods of communicable diseases and Refuse collection system
4. Describe the Milk Sanitation principle and identify the insects control measures.

Course Outcomes:

1. Understanding the concepts of protected water supply. Estimate water demand for a particular town and forecast the population.
2. Exposure to various sources of water, the methods of collection and its conveyance and Calculate the economical diameter of rising main.
3. Ability to identify the various physical chemical and biological parameters of water and the drinking water standards. Select and design appropriate water treatment unit processes.
4. Understanding the concepts of EIA and the methodology of preparation of a systematic EIA report. Exposure to standard laboratory methods of water quality analysis.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO	PSO2	PSO3	PSO4
BTCE15F4400	CO1	3	3	2	3	3				2			3	3	3	3	3
	CO2	3	3	2	3	2				2			3	3	3	3	3
	CO3	3	3	2	1	2		2		2			3	3	3	3	3
	CO4	3	3	1	2	2		2		2			3	3	3	3	3

Course Contents:

UNIT-I: INTRODUCTION : Need for protected water supply, Concepts of rural water supply scheme, Types of water demands- domestic demand in detail, institutional and commercial, public uses, fire demand, per capita consumption and design period –factors affecting, population forecasting, Numerical on population forecast, different methods with merits &demerits- variations in demand of water, peak factors.

Sources and Collection of Water

Surface and subsurface sources – suitability with regard to quality and quantity, Intake structures – different types, sketches, factors of selection and location of intake

UNIT-II:CONVEYANCE OF WATER: Pipes – Design of the economical diameter for the rising main; Pipe appurtenances, various valves, type of fire hydrants, pipe fitting, layout of water supply pipes in buildings; systems of water supply, methods of layout of distribution systems.

QUALITY OF WATER: Objectives of water quality management, Water quality parameters – Physical, chemical and Microbiological, Sampling, Water quality analysis (IS: 3025 and IS: 1622), Drinking water standards BIS & WHO guidelines. Health significance of Fluoride, Nitrates and heavy metals like Mercury, Cadmium, Arsenic etc and toxic / trace organics, water borne diseases, Objectives of Water Treatment, Flow chart of treatment units.

UNIT-III:WATER TREATMENT :

Aeration- Principles, types; Sedimentation- theory, types, Coagulant aided sedimentation-jar test, feeding, flash mixing and clariflocculator; Filtration-theory, types, construction, operation and maintenance of filters; Disinfection- theory, types, minor methods, treatment of swimming pool water; Design criteria of all treatment units, numerical

Miscellaneous treatments -Softening- definition, lime soda process, zeolite process, RO and membrane techniques, - removal of colour, odour and taste, Fluoridation and Defluoridation

UNIT-IV:INTRODUCTION TO EIA :

Environment Impact Assessment, step by step procedure for conducting EIA , Rapid and comprehensive EIA, EIS, FONSI, Need for EIA, , Limitations of EIA, Methodologies- adhoc, checklist, matrix, networks, index, overlay, simulation modeling

EIA guidelines for Development Projects, Public participation in Project activities, Case Studies.

TEXT BOOKS

1. S.K.Garg, Water supply Engineering –Khanna Publishers
2. B C Punima and Ashok Jain, Environmental Engineering I
3. Peavy, H.S., Rowe, D.R., and Tchobanoglous, G., Environmental Engineering - (1986), Mc Graw Hill Book Co.
4. Anjaneyalu Y; BS Publications, Environmental Impact Assessment- Hyderabad.

REFERENCES

1. Manual on Water supply and treatment –CPHEEO, Ministry of Urban Development, New Delhi

2. Hammer, M.J., (1986), Water and Wastewater Technology –SI Version, 2nd Edition, John Wiley and Sons.
3. Karia, G.L., and Christian, R.A., (2006), Wastewater Treatment – Concepts and Design Approach, Prentice Hall of India Pvt. Ltd., New Delhi.
4. Sincero, A.P., and Sincero, G.A., (1999), Environmental Engineering – A Design Approach– Prentice Hall of India Pvt. Ltd., New Delhi.
5. E.W.Steel,Mc Ghee, Terence -'Water Supply Engineering and Sewerage; Mc.Graw Hill
6. Fair, Geyer and Okun-'Water and Wastewater Engineering: Water Supply and Wastewater Removal, 3rd Edition, John Wiley and Sons.
7. Larry. W .Canter, Environmental Impact Assessment, Mc Graw Hill Publications.
8. Ministry of Environment and Forests Notification on EIA of Developments Projects.

BTCE15F4500	Basic Structural Analysis	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	3	4

Prerequisites:

Strength of Materials

Course Objectives:

1. To learn the basics of structures and present the concept of moment area method, conjugate beam method and unit load method to compute slopes and deflections.
2. Present systematic approach for analysing three hinged and two hinged arches.
3. Compute the moments of statically indeterminate structures by consistent deformation method, Clapeyron's theorem of three moments and slope deflection method.
4. Explain and demonstrate the concept involved in the analysis of indeterminate structures by moment distribution method and Kani's method**.**

Course Outcomes:

1. Enumerate the concept involved in analysingstructures by moment area method, conjugate beam method and unit load method.
2. Describe arches and explain the various parameters involved in analysing three hinged and two hinged arches.
3. Analyse statically indeterminate structures using consistent deformation method, Clapeyron's theorem of three moments and slope deflection method.
4. Represent the concept involved in moment distribution method and Kani's method and be able to apply for practical problems.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F4 500	CO1	**2**	**3**	**2**	**1**		**1**	**2**	**1**	**2**	**1**	**1**	**2**	**3**	**3**	**2**	**1**
	CO2	**3**	**3**	**3**	**2**		**1**	**2**	**1**	**2**	**1**	**1**	**2**	**3**	**3**	**2**	**1**
	CO3	**3**	**3**	**3**	**3**		**1**	**2**	**1**	**2**		**1**	**2**	**3**	**3**	**2**	**1**
	CO4	**3**	**3**	**3**	**3**	**2**	**1**	**3**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**1**

Course Contents:

UNIT 1:Introduction: Conditions of equilibrium, Degrees of freedom, Linear and Nonlinear Structures, One, Two, Three-dimensional structural systems, Determinate and indeterminate structures , Static and Kinematic indeterminacy, and simple numerical examples. Strain energy and complementary strain energy, Strain energy due to axial load, bending and shear, Law of conservation of energy, Principle of virtual work, First and second theorems of Castigliano, Maxwell's theorem of reciprocal deflection, Betti's law.(theoretical concepts only)

UNIT 2:Slope and Deflection of Beams

Moment area method, Conjugate beam method, unit load method, simple Numerical examples.

Deflection of Trusses:

Unit load method, simple Numerical examples.

UNIT 3:Three-hinged arches

Three hinged circular and parabolic arches with supports at same level and different levels, Determination of normal thrust, radial shear and bending moment, Numerical problems.

Two-hinged arches:

Two hinged parabolic arch and circular arch, Numerical problems.

UNIT 4:Analysis of statically indeterminate beams:

Analysis of propped cantilever and fixed beam by consistent deformation methods, Analysis of continuous beams by Clapeyron's theorem of three moments, Numerical Problems.

TEXT BOOKS:

1. Devdas Menon, Structural Analysis Narosa Book Distributors Pvt Ltd. (2009).
2. Reddy C. S., Basic Structural Analysis Tata McGraw Hill, New Delhi.
3. Pandit and Gupta, Theory of Structures, Vol. – I, Tata McGraw Hill, New Delhi.
5. B.C. Pumia, R.K., Jain, Strength of Materials and theory of structures Vol I & II, Laxmi Publication New Delhi

REFERENCE BOOKS:

1. Norris and Wilbur, Elementary Structural Analysis, International Student Edition, McGraw Hill Book Co., New York
2. Wang and Chu Kia, Intermediate Structural Analysis by McGraw Hill, New York.
3. R C Hibbeler, Structural Analysis Prentice Hall, New Jersey.

BTCE15F4600	Hydraulic Machines	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	3	4

Prerequisites:

Fluid Mechanics

Course Objectives:

1. Impulse momentum equation and its applications related to Impact of jet on vanes-Flat and Curved – Stationary and moving, Concept of velocity triangles, Work done and efficiency related problems.
2. Introduction to turbines, Classifications, theory, equation for work done and efficiency, design parameters related Pelton, Francis and Kaplan.
3. To learn about performance evaluation of turbines, water hammer in pipes and its estimation.
4. Centrifugal pump, definition, description and general principal of working and related problems.

Course Outcomes:

1. Impulse momentum equation and its applications and learn how to find the magnitude and direction of force excreted by a jet of water on fixed and moving vane and also on a series of flat and curved vanes
2. Determination of work done and efficiency of various types of turbines.
3. How to evaluate the performance of various types of turbines (Impulse and Reaction turbines).
4. Designing and performance evaluation of Centrifugal pumps.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F4 600	CO1	3	3	2	3	3		3					3	3	3	3	3
	CO2	3	3	2	3	2		3					3	3	3	3	3
	CO3	3	3	2	2	2		2					3	3	3	3	3
	CO4	3	3	2	2	2		2					3	3	3	3	3

Course Contents:

UNIT-1: IMPACT OF JET ON VANES

Introduction, Impulse- Momentum equation. Direct impact of a jet on a stationary flat plate, Oblique impact of a jet on a stationary flat plate, Direct impact on a moving plate, Direct impact of a jet on a series of flat vanes on a wheel. Conditions for maximum hydraulic efficiency. Impact of a jet on a hinged flat plate- problem. Force exerted by a jet on a fixed curved vane, moving curved vane. Introduction to concept of velocity triangles, Impact of jet on a series of curved vanes-numerical examples.

UNIT-2: PELTON WHEEL

Introduction to Turbines, Classification of Turbines. Pelton wheel- components, working and velocity triangles. Maximum power, efficiency, working proportions- problems.

KaplanTurbine-Theory, equation for the work done and efficiency, design parameters, problems. Components, Working and Velocity triangles, Properties of the Turbine, Discharge of the Turbines, Number of Blades-numerical examples.

UNIT-3: PERFORMANCE OF TURBINES

Draft tubes types, equation for efficiency, problems.Cavitations in turbines, governing of turbines. Specific speed of a turbine, Equation for the specific speed and problems. Unit quantities of a turbine, definitions, equations and problems. Characteristics curves of turbines, general layout of hydroelectric plants.Water hammer in pipes, equation for pressure rise due to gradual valve closure & sudden closure for rigid and elastic pipes numerical examples.

UNIT-4: CENTRIFUGAL PUMPS

Introduction, Classification, Priming, methods of priming. Heads and Efficiencies. Equation for work done, minimum starting speed, velocity triangles. Multistage Centrifugal Pumps (Pumos in Series and Pumps in parallel). Characteristic Curves for a Single stage Centrifugal Pumps- numerical examples.

TEXT BOOKS:

1. R.K.Rajput, S.Chand & Co, 'A Textbook of Fluid mechanics & Hydraulic Machines'- New Delhi, 2006 Edition.
2. R.K.Bansal, ' Text Book Of Fluid Mechanics& Hydralic Machines'Laxmi Publications, New Delhi, 2008 Edition.
3. Madan Mohan Das, 'Fluid Mechanics and Turbomachines'- PHI Learning Pvt. Limited, New Delhi. 2009 Edition.

REFERENCE BOOKS:

1. Robert w. Fox: Philip j. Pritchard: Alan t. 'Introduction to Fluid Mechanics' –McDonald, Wiley India, New Delhi, 2009 Edition.
2. Edward j.Shaughnessy,jr; Ira m. Katz 'Introduction To Fluid Mechanics' – James p Schaffer, Oxford University Press, New Delhi, 2005 Edition.
4. Dr. P.N. Modi& Dr S.M. Seth, 'Hydraulics and Fluid Mrchanics' –Standard Book House- New Delhi. 2009 Edition.

BTCE17F4700	Advanced Surveying Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Applied Surveying

Course Objectives:

1. To understand basics of linear and angular measurements in field using surveying equipment's.
2. To use compass for setting out of various civil engineering works involving linear and angular measurements.
3. Levelling techniques and contour map development.
4. To set out simple and compound curves by different methods.

Course Outcomes:

1. Develop skills of using instruments for distance measurement and angular measurements.
2. Develop skills to use theodolite for horizontal and vertical angle measurements.
3. Develop skill to measure distance and angle by single plane and double plane methods.
4. Develop skill to setting out simple and compound curves by different methods.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 17F4 700	CO1	3	3	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO4	3	3	3	2	-	-	-	-	2	-	-	3	3	3	3	3

LIST OF PRACTICALS:

1. To determine the tacheometric constants and to determine distance and elevation of an object using tacheometric methods (elevated/depressed LOS).
2. To set a simple curve by offsets from long chord and offsets from chords produced.

3.To set a simple curve and a compound curve by Rankine's deflection angle method.
4.Marking of residential building by centre line method for load bearing wall.
5.Marking of small commercial complex by centre line method for columns.
6.To set out compound curve with angular methods with using theodolite only.
7.Use of Total station in highway alignment.
8.Measurement and data logging of distances, horizontal angles and vertical angles using Total station.
9.Use of GIS software for land Water Resources Engineering Water Resources Engineering.
10.Office work-Design and plotting using AutoCAD.

Text Books:

1. Punmia B C., "Surveying", Vol. 1 & 2, Laxmi Publications Pvt. Ltd., New Delhi. 2009 5T
2. P Kanetkar & S P Kulkarni., "Surveying", Vol. 1 & 2, Tata McGraw Hill Publishing Co. Ltd, New Delhi. 2009.

Reference Books:

1. S K Roy, "Fundamentals of Surveying", Prentice Hall of India, New Delhi. 2009
2. S K Duggal, "Surveying", Vol. 1, Tata McGraw Hill Publishing Co. Ltd., New Delhi. 2008 3.M. Chandra, "Plane Surveying"– New age international (P) Ltd.

BTCE15F4800	Engineering Earth Science Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Engineering Earth Science

Course Objectives:

To make the students capable to identify and study properties of rock and minerals . They also should be able to use modern tools line microscope

Course Outcomes:

1. Student should acquire knowledge about engg. properties of rocks and their minerals.
2. Student should be able to identify rocks and minerals
3. Student should be able to use modern tools live microscope to explore samples.
4. Student should be able to interpret map

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F4 800	CO1	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**3**	**2**	**2**	**3**	**3**
	CO2	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**3**	**2**	**2**	**3**	**3**
	CO3	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**2**	**2**	**2**	**2**	**2**
	CO4	**2**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**2**	**2**	**2**	**2**	**2**

Exp. No.	Name of the Experiment	No. of classes
1.	Identification of Minerals as mentioned in theory, their properties, uses and manufacturing of construction materials	2
3.	Identification of rocks as mentioned in theory, their engineering properties and uses in construction and decorative purposes	2
4.	Dip and Strike problems: Determination of dip and strike direction in Civil Engineering projects (Railway lines, tunnels, dams, reservoirs) - graphical method	2
5.	Bore hole problems: Determination of subsurface behavior of rocks, their attitude related to foundation, tunnels, reservoirs and mining(Triangular & Square Method)	2
6.	Calculation of bifurcation ratio, drainage density and drainage frequency of a river basin	2
7.	Interpretation of geological maps related to Civil Engineering projects	2
8.	Viva Voce	--
	Total	12

References:

11) Principles of Engineering Geology and Geotechnics by Dimitri P Krynine and William R Judd, CBS Publishers and Distributors, New Delhi.
12) Earthquake Tips - Learning Earthquake Design and Construction by C V R Murthy Published by National Information Centre of Earthquake Engineering, Indian Institute of Technology, Kanpur.
13) Bureau of Indian Standards, IS: 1893, IS: 4326, IS: 13827, IS: 13828, IS: 13920, IS: 13925, IS: 15662-2006.

V SEMESTER

BTCE15F5100	Design of RCC Structural Elements	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Concrete Technology and Alternative Building Materials basic Structural Analysis

Course Objectives:

1. To learn about the concepts and principles of limit state design
2. To compute the ultimate flexural strength, shear strength and torsional strength of reinforced concrete beams.
3. To design reinforced concrete one-way , two-way slabs and Stairs
4. To design reinforced concrete columns and footings.

Course Outcomes:

1. Explain about the concepts and principles of limit state design
2. Compute the ultimate flexural strength, shear strength and torsional strength of reinforced concrete beams
3. Design reinforced concrete, one-way , two-way slabs and Stairs
4. Design reinforced concrete columns and footings

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
BTCE15F5100	CO1	3	2		3		2	2					2	3	1		
	CO2	3	3	3	2	3	2	2	2	1	2	1	2	3	3	3	3
	CO3	3	3	3	2	3	2	2	2	1	2	1	2	3	3	3	3
	CO4	3	3	3	2	3	2	2	2	1	2	1	2	3	3	3	3

UNIT 1:GENERAL PRINCIPLES OF REINFORCED CONCRETE:

Introduction, Materials for Reinforced Concrete, Design Loads, Limit States, Philosophy of limit state design, Partial safety factors, Characteristic and design loads, Characteristic and design strengths, Codal Provisions.

ULTIMATE STRENGTH OF R.C. SECTION: General aspects of Ultimate strength, Stress block parameters for limit state of collapse, Ultimate flexural strength of singly reinforced rectangular sections, Ultimate flexural strength of doubly reinforced rectangular sections, Ultimate flexural strength of flanged sections, Ultimate shear strength of RC sections, Ultimate torsional strength of RC sections, Concepts of development length and anchorage.

UNIT-II:LIMIT STATES OF COLLAPSE AND SERVICEABILITY:

Numerical problems on flexural strength of singly reinforced, doubly reinforced rectangular sections, flanged sections, shear strength and development length.

Codal provisions for flexural design of beams - practical requirements, size of beam, cover to reinforcement-spacing of bars. General aspects of serviceability, Deflection limits in IS: 456–2000, Calculation of short-term and long-term deflections of flexural members, cracking in structural concrete members, Calculation of crack widths.

UNIT-III:DESIGN OF R.C. BEAMS: Codal provisions for critical sections for moment and shears. Anchorages of bars, check for development length, Reinforcement requirements, Slenderness limits for beams to ensure lateral stability, Numerical problems on design of simply supported and cantilever beams (rectangular and flanged sections).

DESIGN OF R.C. SLABS: General considerations of design of slabs, Rectangular slabs spanning one direction, Rectangular slabs spanning in two directions with various boundary conditions. Design of simply supported, cantilever and continuous slabs as per IS: 456–2000.

UNIT-IV:DESIGN OF R.C. COLUMNS: Codal provisions, effective length of column, loads on columns, slenderness ratio, minimum eccentricity, design of short axially loaded columns, design of columns subject to combined axial load and uniaxial moment and biaxial moment using SP–16 charts.

DESIGN OF ISOLATED R.C. FOOTINGS: Introduction, Codal provisions, Design of isolated square and rectangular footings for axial load and uniaxial moment by limit state method, Numerical problems.

DESIGN OF STAIR CASES: General considerations, types of stair case, Codal provisions, live loads, effective span, distribution of loading on stairs, Design of stairs with waist slab.

REFERENCE BOOKS:

1. Unnikrishna Pillai and Menon, Reinforced concrete Design TMH Education Private Limited, New Delhi.
2. P.C. Varghese, Limit State Design of Reinforced concrete PHI Learning Private Limited 2008-2009
3. M.L.Gambhir, Fundamentals of Reinforced concrete Design PHI Learning Private Limited 2008-2009.
4. S.N.Shinha, Reinforced concrete Design TMH Education Private Limited, New Delhi.
5. Karve & Shah, Reinforced concrete Design Structures Publishers, Pune.
6. S. S. Bhavikatti, Design of RCC Structural Elements Vol-I, New Age International Publications, New Delhi.
7. IS:456-2000 and SP-16

BTCE15F5200	Used Water Treatment & Solid Waste Management	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

BTCE14F4400

Course objectives: -

1. Gain an understanding on types of sewerage system, dry weather flow, wet weather flow and design of hydraulic elements of sewers.
2. Understand the various sewer materials, sewer appurtenances and the basic principles of house drainage.
3. Acquire an understanding on the physical, chemical and biological parameters of wastewater and on the self purification of natural streams.
4. To be able to select and design appropriate used water treatment unit processes and understand the objectives of used water reuse and recycle.
5. To learn about solid waste, different methods of collection, treatment, disposal and reuse.
6. Understand the various analytical methods for wastewater analysis.\

Course outcome: -

1. Exposure to the necessity of sanitation, types of sewerage system, dry weather flow and wet weather flow and design of hydraulic elements of sewers.
2. Ability to analyze the various sewer materials, sewer appurtenances and the basic principles of house drainage.
3. Acquire an understanding of the physical, chemical and biological parameters of wastewater and on the self purification of natural streams.
4. Ability to select and design appropriate wastewater treatment unit processes and understand objectives of wastewater reuse and recycle. Acquire knowledge on solid waste management. Exposure to standard laboratory methods of wastewater quality analysis.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS / COs	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
BTCE15	CO1	3	3	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO2	3	2	2	3	3	-	3	-	-	-	-	3	3	3	3	3

F5200	**CO3**	**1**	**3**	**2**	**2**	**3**	**-**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO4	**1**	**3**	**2**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**

Course Contents:

Unit 1: INTRODUCTION

Necessity for sanitation, types of sewerage systems and their suitability. Dry weather flow-factors affecting dry weather flow, flow variations and their effects on design of sewerage system; computation of design flow, wet weather flow, Hydraulic formulae for velocity, effects of flow variations on velocity, self cleansing and non scouring velocities, Design of hydraulic elements for circular sewers flowing full and flowing partially full.

Sewer Materials and Sewer Appurtenances

Sewer materials, shapes of sewers, laying of sewers, joints and testing of sewers, ventilation and cleaning of sewers, Catch basins, manholes, flushing tanks, oil and grease traps, Drainage traps, Basic principles of house drainage, Typical layout plan showing house drainage connections.

Unit 2: USED WATER CHARACTERIZATION

Sampling-significance, techniques and frequency; Physical, Chemical and Biological characteristics of used water; Aerobic and Anaerobic activity, BOD and COD, their significance & problems; self-purification phenomenon, Oxygen sag curve, Zones of purification, , Effluent Disposal standards for land, surface water & ocean, Numerical Problems on Disposal of Effluents, Streeter Phelps equation.

Preliminary Treatment of Used Water

Flow diagram of municipal waste water treatment plant, Preliminary & Primary treatment-Screening, grit chambers, skimming tanks, primary sedimentation tanks – Design criteria & Design examples.

Unit 3: TREATMENT OF USED WATER-REUSE AND RECYCLE

Trickling filter – theory and operation, types and designs; Activated sludge process- Principle and flow diagram, Modifications of ASP, F/M ratio. Design of ASP; Anaerobic Sludge digestion, Sludge digestion tanks, Design of Sludge drying beds; Low cost waste treatment method; Septic tank, Oxidation Pond and Oxidation ditches – Design

Reuse and recycle of used water- Zero effluent discharge systems - Quality requirements for used water reuse, Examples, Sewage farming, sewage sickness, Recreational Reuse, Uses of Sewage in Pisciculture, Groundwater recharge of Sewage Effluents.

Unit 4: SOLID WASTE MANAGEMENT

Definition of solid waste, scope and importance of solid waste management, functional elements, classification and characteristics, collection and transportation, treatment / processing techniques-component separation, volume reduction, size reduction, chemical reduction, biological processing. Disposal methods – open dumping, ocean disposal, incineration, composting, sanitary landfill, biomedical waste disposal, Recycle and reuse of Solid waste – material and energy recovery operations, plastic waste recycle.

TEXT BOOKS

1. S.K.Garg,Sewage Disposal and Air Pollution Engineering –Khanna Publishers
2. B C Punima and Ashok Jain, Wastewater Engineering –Lakshmi Publishers
3. Peavy, H.S., Rowe, D.R., and Tchobanoglous, G., Environmental Engineering - (1986), Mc Graw Hill Book Co.
4. Integrated Solid Waste Management- Tchobanoglous, Mc.Graw Hill

REFERENCES

1. Manual on Wastewater Treatment –CPHEEO, Ministry of Urban Development, New Delhi
2. E.W.Steel,Mc Ghee, Terence -'Water Supply Engineering and Sewerage; Mc.Graw Hill
3. Fair, Geyer and Okun-'Water and Wastewater Engineering: Water Supply and Wastewater Removal, 3rd Edition, John Wiley and Sons.
4. Metcalf and Eddy: 'Waste Water Treatment, Disposal and Reuse'; Tata McGraw Hill Publications.
5. Solid Waste Management in Developing Countries; Bhinde and Sunderashan

BTCE15F5300	Transportation Engineering-I	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

NONE

Course Objectives:

1. To educate students about the importance of transportation, various modes of transportation with emphasis on road transportation.
2. To make students familiar with the components of railway tracks along with the basic geometric features.
3. To give students an overview of the planning and working of airports, along with the geometric features of runways and taxiways.
4. To make students appreciate the effects of natural phenomena on the components of harbours and ports and the basic aspects of tunneling.

Course Outcomes:

1. Compare the various modes of transportation; explain the principles of transportation planning and the need for integration of the various modes of transportation, with emphasis on highway geometrics and road traffic.
2. Describe the characteristics of rail transportation and the requirements of the components, simple track junctions; compute the geometric features of railway tracks and the permissible speeds.

3. Associate the aircraft characteristics to the functioning of the various components of airports; illustrate the utility of the guiding and control aids; compute the geometric features of runways and taxiways.
4. Enumerate the different types of harbours and their components; illustrate the effects of wind, waves and tides on water front structures and the protection measures; outline the methods of tunneling, tunnel lining, drainage and ventilation

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 300	CO1	**3**	**3**				**2**	**3**	**3**	**3**	**3**		**1**	**3**	**3**	**2**	**3**
	CO2	**3**	**3**	**3**	**2**	**1**	**2**	**2**	**3**	**2**	**2**			**3**	**2**	**3**	**3**
	CO3	**3**	**3**	**3**	**3**		**2**	**3**	**3**	**3**	**3**	**1**	**2**	**3**	**3**	**2**	**2**
	CO4	**3**			**3**	**3**	**3**	**3**	**2**	**2**	**3**		**2**	**3**	**3**		**1**

UNIT – 1

Importance of transportation, comparison of various modes of transportation, importance and scope of highway engineering, highway planning and alignment, importance of highway geometric design and scope of traffic engineering, principles of urban transportation, mass transit facilities, integration of different modes of transportation – numerical examples.

UNIT – 2

Components of railway track, gauges, typical cross sections, coning of wheels and tilting of rails, hauling capacity of locomotives and train loads on railways, types of rails, rail length, rail joints, creep of rails, sleepers, ballast, rail fixtures, gradients and grade compensation, speed of trains on curves, points and crossings, design calculations of turnouts - numerical examples.

UNIT – 3

Layout of an airport and components, typical airport layouts, planning of terminal area, aircraft parking system, aircraft characteristics affecting planning and design of airports, site selection, orientation of runway, basic runway length and corrected runway length, taxiways and exit taxiways, airport markings and lighting, air traffic control, ILS - numerical examples.

UNIT – 4

Classification of harbours, layout of harbours, component parts, effects of natural phenomena on harbour structures, breakwaters, tunnels and open-cuts, – advantages and disadvantages, setting out of tunnel, shapes of tunnels, tunneling in soft soils (needle beam and shield methods only), tunneling in rocks, tunnel lining, drainage of tunnels, tunnel ventilation.

REFERENCE BOOKS:

1. Khanna S.K and Justo C.E.G, "Highway Engineering", Nemchand and Bros, Roorkee.
2. Saxena S C and Arora S P, "A Text Book of Railway Engineering", Dhanpat Rai Publications Pvt. Ltd. New Delhi.
3. Khanna S K, Arora M G and Jain S S, "Airport Planning and Design", Nemchand and Bros. Roorkee.
4. Srinivasan R, "Harbour Dock and Tunnel Engineering", Charotar Publishing House, Anand.
5. Kadiyali L.R, "Traffic Engineering and Transportation Planning", Khanna Publishers, Delhi.
6. Satish, Chandra and Agarwal M M, "Railway Engineering", Oxford University Press, New Delhi.
7. Horonjeff, "Planning and Design of Airports", McGraw Hill Publications, New Delhi. William W. Hay, "An Introduction to Transportation Engineering", Toppan Company Ltd., Tokyo.

BTCE15F5400	Hydrology & Irrigation Engineering	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Fluid mechanics

Course Objectives:

1. To impart the knowledge of hydrology that deals with the occurrence, distribution and movement of water on the earth.
2. To educate the students about the Precipitation and related losses of water, concepts of Runoff & Hydrograph for applications like Flood etc.
3. To impart knowledge of various irrigation techniques and water requirements of crops along with assessment of irrigation water.
4. To learn the canal irrigation distribution system along with design of canal.

Course Outcomes:

1. Outline the important process involved in the water cycle & identify methods for determining Precipitation & Components of Water Losses.
2. Classify the runoff components and predict the surface runoff based on hydrograph theory.
3. Summarize various irrigation techniques &estimate water requirements of the crops.

4. Classify the distribution system for canal irrigation. And describe the design procedure of canal systems.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O2	PS O3	PS O4
BTCE 15F5 400	CO1	**3**		**2**		**2**	**2**	**3**					**1**	**3**	**2**	**1**	**1**
	CO2	**2**	**3**	**1**	**2**		**2**		**2**	**1**		**1**		**2**	**3**	**3**	**2**
	CO3	**1**	**1**	**3**	**2**	**3**	**3**	**3**			**1**	**2**	**2**	**3**	**2**	**2**	**1**
	CO4	**3**	**2**	**2**	**1**		**2**		**1**		**2**	**3**		**2**	**3**	**3**	**2**

Course Contents:

UNIT 1

INTRODUCTION & WATER LOSSES: Introduction, Water budget equation, Precipitation: introduction, forms of precipitation, types of precipitation, measurement of precipitation (Simon's gauge & Syphon gauge only), selection of rain gauge station. Adequacy of rain gauges, methods of computing average rainfall, interpolation of missing data, adjustment of missing data by double mass curve method. Hyetograph and mass curve of rainfall. Evaporation: Definition, factors affecting, measurement (Class A pan). Estimation using empirical methods (Meyer's and Rohwer's equation), evaporation control. Evapo-transpiration: Definition, factors affecting, measurement, estimation (Blaney criddle method) Infiltration: Definition, factors affecting, measurement (double ring infiltrometer), infiltration indices, Horton's equation of infiltration.

UNIT 2

RUNOFF & HYDROGRAPHS: Definition, concept of catchment, water budget equation, componenets, factors affecting, rainfall runoff relationship using simple regression analysis. Definition, components of hydrographs, unit hydrograph and its derivation from simple storm hydrograph, base flow separation, Prepositions of unit hydrograph-problems.

UNIT 3

INTRODUCTION TO IRRIGATION ENGINEERING:

Introduction, need for irrigation, advantages and disadvantages of irrigation, environmental impacts of irrigation, Systems of irrigation: Gravity irrigation, lift irrigation, well irrigation, tube well

irrigation, infiltration galleries, sewage irrigation, supplemental irrigation. Soil-water-plant relationship, soil moisture. Irrigation relationship, frequency of irrigation. Water requirement of crops: Introduction, definitions, crop seasons of India, water requirement of a crop, duty, delta, base period. Consumptive use. Irrigation efficiencies. Assessment of irrigation water with numerical examples.

UNIT 4

CANALS: Definition, Types of canals, Silt theory, Alignment of canals, Design of canals by Kenedy's and Lacey's methods- Problems

TEXT BOOKS:

1. Subramanya.K Engineering Hydrology – Tata Mcgraw Hill NewDelhi-2008 (Ed)
2. Madan Mohan Das, Mim Mohan Das Hydrology- -PHI learning private Ltd. New Delhi-2009 (Ed)
3. Jayarami Reddy, A Text Book Of Hydrology- Laksmi Publications, New Delhi-2007 (Ed)
5. P.N.Modi Irrigation, water Resources and water power Engineering-standard book house, New Delhi.
6. Madan Mohan Das & Mimi Das Irrigation and Water Power Engineering- Saikia; PHILearning pvy. Ltd. New Delhi 2009 (Ed).

REFERENCE BOOKS:

1. Ghanshyam Das- Hydrology & Soil Conservation Engineering- PHI Learning Private Ltd., New Delhi-2009 (Ed)
2. Patra K.C.Narosa Hydrology & Water Resources Engineering- Book Distributors Pvt. Ltd. New Delhi-2008 (Ed)
3. R.K.Sharma & Sharma, Hydrology & Water Resources Engineering- Oxford and Ibh, New Delhi
4. S. K.garg-Irrigation Engineering and Hydraulic structures- Khanna Publication, New Delhi.

BTCE15F5500	Geotechnical Engineering-I	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Basic knowledge of Engineering Mechanics, Strength of Materials and Fluid Mechanics

Course Objectives:

1. To create an ability to apply knowledge of geotechnical engineering.
2. To conduct experiments, as well as to analyse and interpret data related to the geotechnical engineering.
3. To accentuate the understanding of the basic principles.
4. To identify the type and characteristics of soil.

Course Outcomes:

1. Understand basic concepts of soil and they will be knowing the classification of soil.
2. Analysis of water soil interaction and seepage activities in soil.
3. Characterisation of compaction and consolidation of soil in field and Laboratory.
4. Understands the strength characteristic of soil in construction.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 500	CO1	3	3	1	3	2	2	1			2			3	3	3	2
	CO2	3	2	1	3		2	1			2			3	3	3	2
	CO3	3	2	3	3		2	1			2			3	3	3	1
	CO4	3	2	3	3		2	1			2			3	3	3	2

Course Contents:

UNIT I - INTRODUCTION

Formation of soil – types of soil – clay mineralogy and soil stucture**:** Soil-Water system, Electrical diffuse double layer, adsorbed water, base-exchange capacity, Common clay minerals in soil and their structures- **INDEX PROPERTIES**-Three phase system of soil and their relationships –Grain size analysis – Stoke's law and hydrometer analysis – Consistency of soils –Determination of consistency indices – Classification of coarse grained and fine grained soil as per BIS

08 hours

UNIT II - PERMEABILITY AND SEEPAGE

Permeability –Definition – Assumption - one dimensional flow through soil – Darcy's law – Limitations - Discharge velocity and seepage velocity – factors affecting the permeability – permeability determination - lab and field methods – permeability in stratified soil deposits – Introduction of flow net and its properties - application of flow net.

08 hours

UNIT III - COMPACTION AND CONSOLIDATION

Compaction – field and lab methods – Proctor's test – factors affecting the compaction – effect of compaction in soil properties – **Consolidation** – Terzaghi's theory of one dimensional consolidation

- partial differential equation (no analytical solution) – Lab method - coefficient of consolidation – Determination - √t and log t methods.

8 hours

UNIT IV – EFFECTIVE STRESS AND SHEAR STRENGTH

Introduction – stresses in soil – concept of effective and neutral stresses – Introduction. Shear strength – shear strength of cohesive and cohesion less soils – Mohr coulomb's theory –Direct shear, Triaxial, unconfined shear strength – Lab and field vane shear test - factors affecting the shear strength.

08 hours

TEXT BOOKS

1. Murthy V.N.S. **Principles of Soil Mechanics and Foundation Engineering**-, 4th Edition, UBS Publishers and Distributors,New Delhi(1996).

2. Punmia .B.C, ***"Soil Mechanics and Foundations"***, Laxmi Publications Pvt. Ltd., 2005.

3. Gopal Ranjan and Rao .A.S.R**, "*Basic and Applied Soil Mechanics*",** New age international(p) Ltd.,2007.

4. Braja, M. Das **Geotechnical Engineering**;, Fifth Edition, Thomson Business Information India (P) Ltd., India(2002)

REFERENCES BOOKS:

1. Bowles J.E. **Foundation Analysis and Design**- 5th Edition, McGraw Hill Pub. Co. New York. (1996),

2. Alam Singh and Chowdhary G.R. **Soil Engineering in Theory and Practice**, CBS Publishers and Distributors Ltd., New Delhi. (1994)

4. Donold P Coduto **Geotechnical Engineering**- Phi Learning Private Limited, New Delhi

5. Shashi K. Gulathi & Manoj Datta. **Geotechnical Engineering**, Tata Mc Graw Hill(2009).

7. Narasimha Rao A. V. & Venkatrahmaiah C.**Numerical Problems, Examples and objective questions in Geotechnical Engineering**, Universities Press,Hyderabad (2000).

8. **BIS Codes of Practice**: IS 2720(Part-3/Sec. 1) – 1987; IS 2720 (Part – 2)- 1973; IS 2720 (Part – 4) – 1985; IS 2720 (Part – 5) – 1985; IS 2720 (Part – 6) – 1972; IS 2720 (Part – 7) – 1980; IS 2720 (Part – 8) – 1983; IS 2720 (Part – 17) – 1986; IS 2720 (Part - 10) – 1973; IS 2720 (Part – 13) – 1986; IS2720 (Part 11) – 1971; IS2720 (Part 15) – 1986; IS 2720 (Part 30) – 1987; IS 2720 (Part 14) – 1977; IS 2720 (Part – 14) – 1983; IS 2720 (Part – 28) – 1974; IS 2720 (Part – 29) – 1966, IS 2720 (Part-60) 1965.

BTCE15F5600	**Intermediate Structural Analysis**	**L**	**T**	**P**	**C**	**Hrs/Wk**
Duration :16 Wks		**2**	**1**	**0**	**3**	**4**

Prerequisites:

Basic Structural Analysis

Course Objectives:

1. To learn about the basic concepts and principles of vibration of structures.
2. To learn about mathematical modeling of vibratory systems.
3. To analyze the free vibration of SDOF system (undamped and damped)

Course Outcomes:

1. To learn about the advantages and disadvantages of statically indeterminate structures
2. To determine the degree of static and kinematic indeterminacy of skeletal structures
3. To analyze statically indeterminate beams and rigid-jointed plane frames by slope deflection, moment distribution and Kani's methods.
4. To analyze plane trusses and axially rigid plane frames by stiffness and flexibility matrix methods (system approach only)

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 600	CO1	3	3	1		2	2	1					2	3	3		2
	CO2	3	3	1										3	3		
	CO3	3	3	1		3	2						2	3	3		3
	CO4	3	3	1		3	2						2	3	3		3

Course Contents:

UNIT1:Introduction: Statically indeterminate structures**,** Advantages and advantages**,** Concept of compatibility, determination of degree of static and kinematic determinacies of plane trusses, rigid frames and grids.

Slope Deflection Method: Assumptions and development of slope-deflection equations, analysis of statically indeterminate beams and rigid-jointed plane frames with and without sidesway. Numerical examples.

UNIT2:Moment Distribution Method: Introduction, Definition of terms Stiffness factor, Distribution factor, Carry-over factor, Analysis of beams and rigid jointed plane frames with and without side sway. Numerical examples.

Kani's Method: Introduction, rotation and displacement contribution factors, Advantages, Analysis of Continuous beams and Analysis of rigid jointed plane frames with and without sideway. Numerical examples.

UNIT3:Flexibility Method: Introduction, system and element approaches, Analysis of plane trusses and axially rigid plane frames by flexibility method (system approach only). Numerical Problems

Stiffness Method: Introduction, system and element approaches, Analysis of plane trusses and axially rigid plane frames by stiffness method (system approach only). Numerical examples,

UNIT4:Basic principles of structural dynamics: Vibrations and causes, periodic and aperiodic motion, harmonic and non-harmonic motion, Basic elements of a vibratory system, Concepts of free and forced Vibration, Viscous damping, Mathematical modeling, Dynamics degrees of freedom, Free vibration of Single Degree of Freedom System with and without damping, Simple Numerical Problems.

REFERENCE BOOKS:

1. Devdas Menon, Advanced Structural Analysis Narosa Book Distributors Pvt.Ltd, (2009).
2. Reddy C.S. Basic Structural Analysis - Second Edition, Tata McGraw Hill Publication Company Ltd.
3. Wang and Chu-Kia, Intermediate Structural Analysis McGraw Hill, New York.
4. Theory of Structures Vol. 2 - Tata McGraw Hill Publication Company Ltd.
5. S.P. Gupta, G.S. Pandit and R.Gupta, Structural Dynamics Mario Paz, & William League, Kluwer Academic Publishers.
6. S. S. Bhavikatti – Structural Analysis-II - Vikas Publishers, New Delhi.
7. D.S. Prakash Rao, Structural Analysis- A Unified Approach,University Press Structural Analysis, 4th SI Edition by Amit Prasanth & Aslam Kassimali, Thomson Learning.

BTCE15F5710	Design of Masonry Structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Knowledge of Alternate Building Materials and Concrete Technology

Course Objectives:

1. To learn the history of masonry structures
2. To learn the characteristics, classification and properties of masonry materials
3. To learn the strength and elastic behaviour of masonry under compression
4. To learn the failure theories of masonry under compression.

Course Outcomes:

1. Has learnt the history of masonry structures
2. Has learnt the characteristics, classification and properties of masonry materials
3. Has learnt the strength and elastic behaviour of masonry under compression
4. Has learnt the failure theories of masonry under compression.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 710	CO 1					3	2	3	2	2		2	2	3	1	1	3
	CO 2	2				2	2	3	1	1		1	2	3	2	1	3
	CO 3	2		2	1	1	1	3	1	1			2	3	2	1	3
	CO 4	3	1		1	1		3	2	1	1		3	3	2	1	3

Course Contents:

UNIT1: Masonry Units, Materials, Types, Masonry Construction, Strength and Stability:

Brick, stone and block masonry units, strength, modulus of elasticity and water absorption of masonry materials, classification and properties of mortars, selection of mortars, Defects and errors in masonry construction, cracks in masonry, types, reasons for cracking, methods of avoiding cracks. Strength and Stability of concentrically loaded masonry walls, effect of unit strength, mortar strength, joint thickness, rate of absorption, effect of curing, effect of ageing, workmanship, strength formulae and mechanism of failure for masonry subjected to direct compression.

UNIT 2: Permissible stresses, Design considerations:

Permissible compressive stress, stress reduction and shape reduction factors, increase in permissible stresses for eccentric vertical and lateral loads, permissible tensile and shear stresses, Effective height of walls and columns, opening in walls, effective length, effective thickness, slenderness ratio, eccentricity, load dispersion, arching action, lintels.

UNIT 3: Load considerations for masonry, Design of masonry walls:

Wall carrying axial load, eccentric load with different eccentricity ratios, walls with openings, freestanding wall, Design of load bearing masonry for building up to 3 storeys using IS: 1905 and SP: 20 procedure.

UNIT 4: Reinforced masonry, Masonry walls in composite action:

Application, flexural and compression elements, shear walls, Composite wall – beam elements, infilled frames.

REFERENCE BOOKS:

1. Hendry, A.W, "**Structural Masonry**" Macmillan Education Ltd, Oxford, 1990.
2. Dayaratnam P, "**Brick and Reinforced Brick Structures**", Oxford & IBH, 1987.
3. Arnold W. Hendry, B.P Sinha & S.R.Davies,E "**Design of Masonry structures**" & Fn SPON, London.
3. **IS 1905–1987,** "Code of practice for structural use of un-reinforced masonry- (3rd revision) BIS, New Delhi.
4. **SP 20 (S&T) – 1991**, "Hand book on masonry design and construction (1st revision) BIS, New Delhi.

BTCE15F5720	Advanced Surveying	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Surveying

Course Objectives:

1. Have an overview of the advanced surveying techniques and modern surveying equipment.
2. Use the concepts of advanced data capturing methods.
3. Analyse spatial data using appropriate computational and analytical techniques.

Course Outcomes:

1. Acquire knowledge about the modern surveying equipment.
2. Determine the depth of water bodies by sounding.
3. Use modern surveying instruments to obtain geo-spatial data and analyse the same to appropriate engineering problems.
4. Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 720	CO1	3	2	2	1	-	-	-	-	-	-	-	-	3	3	1	2
	CO2	3	3	1	2	1	-	-	-	-	-	-	-	3	3	1	2
	CO3	2	2	-	-	1	1	-	-	-	-	-	-	3	3	1	2
	CO4	2	2	-	1	1	-	-	-	-	-	-	-	3	3	1	2

UNIT - I

THEORY OF ERRORS AND TRIANGULATION ADJUSTMENT: Errors and classification of errors Precision and accuracy, Laws of weights and accidental errors.

PROBABILITY: Probability distribution function and density function- normal distribution. RMS error-measure of precision. Rejection of observations-principles of least squares-Normal equations

UNIT – II

METHOD OF CORRELATES: Triangulation adjustment. Angle adjustment, station adjustment and figure adjustment. ELECTRONIC DISTANCE MEASUREMENT (EDM): Introduction, Electro Magnetic (EM) Waves. Phase comparison and modulations. Instruments – Geodimeter – Tellurimeter – Distomat – Range finders – Radars.

UNIT – III

FIELD ASTRONOMY: Earth celestial sphere. Solar system Position by altitude and azimuth system-spherical triangle and spherical trigonometry. Astronomical triangle. Nepiers rule. TIME: Siderial time, day and year-solar time and day-Greenwich mean time-standard time. Meridian and azimuth-their determination - latitude and its determination.

UNIT – IV

Photogrammetry – Introduction, basic definitions, terrestrial photogrammetry, phototheodolite, horizontal and vertical angles from terrestrial photographs, horizontal position of a point from photographic measurements, elevation of ponts by photographic measurements, determination of focal length. Aerial Photogrammetry- advantages, vertical, tilted and oblique photographs, geometry of vertical photographs, scale of vertical photograph over flat and variable terrain, ground coordinates, computation of length of a line, computation of flying height, relief displacement, overlaps, flight planning, computation of required number of photographs for a given area, ground control in photogrammetry. Basics of stereoscopy, stereoscopes, uses, parallax. Basic elements in photographic interpretation. Introduction to digital photogrammetry.

Reference Books:

1. Punmia B C., “Surveying”, Vol. 2 & 3, Laxmi Publications Pvt. Ltd., New Delhi. 2009.
2. T P Kanetkar & S P Kulkarni., “Surveying”, Vol. 2 & 3, Tata McGraw Hill Publishing Co. Ltd, New Delhi. 2009.
3. S K Duggal, “Surveying”, Vol. 2, Tata McGraw Hill Publishing Co. Ltd., New Delhi. 2008.
4. Mikhail E., J. Bethel, and J.C. McGlone, “Introduction to modern photogrammetry”, Wiley, 2001.
5. Wolf P.R, and B.A. Dewitt, “Elements of photogrammetry: with applications in GIS”, 3rd ed, McGraw-Hill, 2000.

Wolf P.R, and B.A. Dewitt, “Elements of photogrammetry: with applications in GIS”, 3rd ed, McGraw-Hill, 2000.

BTCE15F5730	Remote Sensing and GIS	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

water supply and Sanitation Engineering, Hydraulic machines

Course Objectives:

1. To educate students about GIS and Remote sensing
2. To make students familiar with the recent techniques of remote sensing and GIS
3. To educate students on its application in Traffic and Transportation Engineering
4. To give an overview of importance and application of remote sensing and GIS

Course Outcomes:

1. Explain the basics of Remote Sensing.
2. Explain the various GIS techniques
3. Describe their application in the Transportation engineering.
4. Enumerate the uses in other streams of civil engineering

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 730	CO1	3	1	1	2	3				2			3	3	3	3	3
	CO2	3	3	2	3	2				2			3	3	3	3	3
	CO3	3	3	2	1					1			3	3	3	3	3
	CO4	3	3	1	2	3	2	3		2			3	3	3	3	3

UNIT - I

Introduction, Ideal remote sensing system, basic principles of electromagnetic remote sensing, electromagnetic energy, electromagnetic spectrum, interaction with earth's atmosphere, interaction with earth- surface materials, spectral reflectance of earth surface materials. Remote sensing platforms and sensors: Introduction, platforms- IRS, Landsat, SPOT, Cartosat, Ikonos, Envisat etc. Sensors-active and passive, MSS, AVHRR, LISS, TM, PAN, WIFS, microwave sensors, sensor resolutions (spatial, spectral, radiometric and temporal).

UNIT – II

Properties of digital image data, data formats, Basics of digital image processing- radiometric and geometric corrections, image enhancements, image transforms based on arithmetic operations,

image filtering. Remote sensing image interpretation, thematic classification (supervised and unsupervised) , maximum likelihood classification, introduction to accuracy assessment of classification. Applications of Remote sensing: applications in land use & land cover analysis, change detection, water resources, urban planning, environmental and geological applications.

UNIT – III

Geographic Information system concepts and spatial models. Introduction, Spatial information, temporal information, conceptual models of spatial information, representation of geographic information. GIS Functionality – Introduction, data acquisition, preliminary data processing, data storage and retrieval, spatial search and analysis, graphics and interaction.

Computer Fundamentals of GIS and Data storage, Fundamentals of computers vector/raster storage character files and binary files, file organization, linked lists, chains, trees. Coordinate systems and map projection : Rectangular polar and spherical coordinates, types of map projections, choosing a map projection.

UNIT – IV

GIS DATA MODELS AND STRUCTURES – Cartographic map model, Geo-relation model, vector/raster methods, non-spatial data base structure viz., hierarchal network, relational structures. DIGITIZING EDITING AND STRUCTURING MAP DATA – Entering the spatial data (digitizing), the non-spatial, associated attributes, linking spatial and non-spatial data, use of digitizers and scanners of different types.

Reference Books:

1. Lillesand T.M., and R.W. Kiefer, "Remote sensing and image interpretation", 4th ed, John Wiley & Sons, 2000.
2. Jensen J.R., "Introductory digital image processing: a remote sensing perspective", 2nd ed Prentice Hall, 1996.
3. Richards J.A., and X. Jia, "Remote sensing digital image analysis: an introduction", 3rd ed Springer, 1999.
4. Mather P.M., "Computer processing of remotely-sensed images: an introduction", Wiley, 1988.
5. Peter A Burrough and Reachael A Mc. Donnel, "Principles of GIS", Oxford publications.
6. George Joseph, "Fundamentals of Remote Sensing", Universities Press, Hyderabad.
7. C.P.Lo. Albert K.W. Yeung, "Concepts and Techniques of Geographic Information Systems" 2nd Edition, PHI Learning, New Delhi – 2009

BTCE15F5740	Ground Water Hydraulics	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Fluid Mechanics

Course Objectives:

1. To learn aboutvarious types of Aquifers,
2. Darcy's Law and related technical terms and related problems,
3. Ground water recharge, runoff and balance, ground water development and management,
4. ground water exploration Techniques. Saline water intrusion.

Course Outcomes:

Students will be able to solve problems related

1. To permeability and transmissibility,
2. How to carry out ground water recharge, measurement of runoff and ground water balance.
3. Construction of different types of wells,
4. modeling in ground water management by different methods, Ground water exploration, saline water intrusion and pretension.

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 740	CO1	3	1	1	2	3				2			3	3	3	3	3
	CO2	3	3	2	3	2				2			3	3	3	3	3
	CO3	3	3	2	1					1			3	3	3	3	3
	CO4	3	3	1	2	3	2	3		2			3	3	3	3	3

Course Contents:

UNIT 1: INTRODUCTION: Ground water occurrence, definition of aquifer, aquifuge, aquitard and aqueduct. Types of aquifer & its parameters, Darcy's law, hydraulic conductivity, permeability coefficient, intrinsic permeability, transmissibility, problems.

UNIT 2:GROUND WATER RECHARGE, RUNOFF AND BALANCE: Artificial recharge: spreading method, urban storm runoff, vertical recharge, recharge component estimation, ground water discharge estimation, ground water balance and its components, case study.

UNIT 3:GROUND WATER DEVELOPMENT AND MANAGEMENT: Type of well, method of construction, tube well, dug well, ground water development, water logging, conjunctive use, modeling in ground water management, well hydraulic- thesis method, coofer and Jacob method, case study.

UNIT 4:GROUND WATER EXPLORATION TECHNIQUES: Hydro geologic well logging, geophysical well logging, tracer techniques, problems, seismic method, electrical resistivity method, geologic and hydrologic logging, case study.
Ground water extraction& intrusion, ghyben-Herzberg relation, saline zones & interface, prevention & control of saline water intrusion, zone of diffusion.

TEXT BOOK:

1. K Todd- Wiley & sons Ground water hydrology, New Delhi.
2. H.M. Raghunath- Ground water: Wiley Eastern Limited.
3. Karanath K .R : Ground water Assessment, Development and management, Tata McGraw hill, New Delhi, 1987

REFERENCE BOOK:

1. Bower H, Ground water Hydrology: McGraw hill, New Delhi.
2. Garg satya prakesh Ground water and tube well :– oxford & IBH, New Delhi

BTCE15F5750	Urban Transport Planning	L	T	P	C	Hrs/Wk
Duration:16 Wks		3	1	0	4	5

Prerequisites:

NONE

Course Objectives:

1. To make students familiar with the basic definitions of urban system components, elements; to give an idea about land use and traffic
2. To educate students about the various surveys and their interpretation
3. To give students an overview of the various models used to know the trip generation and distribution.
4. To make students appreciate the factors affecting modal split, traffic assignment techniques and the economic evaluation

Course Outcomes:

On successful completion of this course, students should be able to:

1. Discuss the interdependence of land use and traffic, difficulties in transport planning and the system approach to urban planning along with the stages involved
2. Describe the procedure and suitability of various types of surveys, transport demand and supply
3. Appreciate the methods of trip generation and distribution, comparison of various models used to generate O-D matrix
4. Enumerate the different factors affecting modal split, traffic assignment techniques, consideration of evaluation and expressing evaluation in economic terms.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 750	CO1	3					3		2		2		2	3			1
	CO2	3	3			2		2	2	3	3	1		3	3		1
	CO3	3	3		2	2	3	1		3	1	2		3	3	1	2
	CO4	3	3		2	2	1	2	3		3		2	3			2

UNIT – 1 **[12]**

Introduction to urban system components, concepts and definitions, scope of urban transport planning, elements of urban transportation planning, interdependency of land use and traffic, Urban Transport planning for small and medium sized cities, Difficulties in transport planning-Systems approach to urban planning-Stages- Inventory of Existing Conditions

UNIT – 2 **[12]**

Transport Surveys: Basic Movements-Study Area- Zoning-Surveys- Planning of different types of surveys and interpretation- expansion of data from sample- Transport modeling, Transport demand and supply- Traffic surveys for mass transit system planning- Mass Transit Systems: Capacity, Fleet planning and Scheduling, Traffic surveys for mass transit system planning,

UNIT – 3 **[12]**

Trip Generation and Distribution: Factors governing trip generation and attraction – Application of Regression Analysis- Methods of trip distribution: Growth Models and Synthetic Models-Calibration and Application of gravity model, Problems - Category analysis.

UNIT – 4 **[12]**

Modal Split: Factors affecting modal split, Modal split in transport planning, recent developments in modal split analysis

Traffic Assignment: Principles of traffic assignment; assignment techniques. Problems

Evaluation: Need for evaluation, Identification of corridor; Formulation of plans; Economic evaluation.

REFERENCE BOOKS:

1. Kadiyali, L.R., `Traffic Engineering and Transportation Planning' - Khanna Publication, New Delhi, 2009
2. Jotin Khisty and B. Kent Lall "Transportation Engineering –An Introduction"- PHI, New Delhi, 3rd Indian Edition, 2006.
3. Hutchinson, B.G., `Principles of Urban Transport System Planning' - McGraw Hill Book Co., London, UK, 1982.
4. Institute of Traffic Engineers - An Introduction to Highway Transportation Engineering' New York., 1982
5. Transportation Planning Resource Guide
6. M.J.Bruton; Introduction to Transportation Planning –Hutchinson of London Ltd.

BTCE15F5800	CAD Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Building planning Drawing

Course Objective:

1. Preparation of drawings of building components
2. Functional design of buildings (residential, public and industrial)
3. Development of plan, elevation and sectional views, water supply, sanitary and electrical layouts of residential buildings given line diagram.
4. To develop line diagrams for non-residential buildings

Course Outcomes:

1. Able to prepare drawings of building components
2. Able to carry out functional design of buildings (residential, public and industrial)
3. Able to develop plan, elevation and sectional views of residential buildings given line diagram. To prepare water supply, sanitary and electrical layouts.
4. Able to develop line diagrams for non-residential buildings Using drafting software.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
	CO1	3	2	2						2			3	3	3	3	3
	CO2	3	2	3	2					2			3	3	3	3	3

BTCE 15F4 300	CO3	**3**	**2**	**3**	**2**					**2**			**3**	**3**	**3**	**3**	**3**
	CO4	**3**	**2**	**3**	**1**					**2**			**3**	**3**	**3**	**3**	**3**

1.AUTOCAD: Basics of AUTOCAD, Drawing Tools- Lines, Circle, Arc, Polyline, Multiline, Rectangle, Ellipse, **Modify Tools**–Erase, copy, Mirror, offset, Array, Move, Rotate, Scale, Stretch, Lengthen, Trim, Extend, Break, Chamfer and Fillet. **Using Text**: Single Line Text, Multiline text, Spelling, Edit Text: Special features, View Tools, Layers, Concept, Dimension tools, Hatching, Customizing toolbars, working with multiple drawings.

2.Use of AUTOCAD in Civil Engineering: Cross Section of Foundation, Staircases, Lintel and Chejja, Slab and Beams, Plan, Elevation, Cross Section of TWO Story Building.

3.Use of EXCEL In Civil Engineering: SFD & BMD for Cantilever, Simply Supported Beams, Design of Singly & doubly reinforced beams, Computation of earth work, design of horizontal curves and design of super elevation.

REFERENCE BOOKS:

1. Shah M.H and Kale C.M, **Building Drawing**, Tata Mc-Graw Hill Publishing co. Ltd., NewDelhi.
2. Gurucharan Singh, **Building Construction,** Standard Publishers &distributors, New Delhi.
3. **National Building Code**, BIS, New Delhi.
4. 4. N.Kumarswamy and A. Kameswara Rao, **Building Planning And Drawing,** Chartor Publishing House Pvt. Ltd.Dr.*Balagopal and T.S.Prabhu*, ***Building Drawing and Detailing*** - *Spades Publishers*, Calicut.

BTCE15F5900	**Geotechnical Engg Lab**	**L**	**T**	**P**	**C**	**Hrs/Wk**
Duration :16 Wks		**1**	**0**	**1**	**2**	**3**

Prerequisites:

Geotechnical Engineering

Course Objectives:

1. To gain experience regarding the determination of properties of different types of soils and understand how they behave
2. To provide an opportunity to learn how to measure the shear strength of the soil and its importance
3. To impart knowledge about the foundation engineering.

Course Outcomes:

1. Determine the index properties of the soil
2. Classify the soil and identify the suitability of the soil for different foundations.
3. To implement the properties of soil for the analysis and design of foundations

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O2	PS O3	PS O4
BTCE 15F5 900	CO1	3	3	1	1	1	2	1	-	1	2	-	2	3	2	2	2
	CO2	3	2	1	2	1	2	1	-	1	2	-	2	3	2	2	2
	CO3	3	2	2	3	1	2	1	-	1	2	-	2	3	2	2	1

Course Contents:

List of Experiments:

1. Water content determination (Oven drying method), Determination of Specific gravity by Pycnometer and density bottle method.
2. Grain size distribution (Sieve analysis Only)
3. Determination of Liquid (Casagrande method) and Plastic limit.
4. Determination of Shrinkage limit of soil.
5. Determination of moisture-density relationship (Standard Proctor's)
6. Determination of Permeability by Constant and Variable head method.
7. Determination of in-situ density by sand replacement and core cutter method.
8. Unconfined compression test for fine grained soils.
9. Triaxial Compression Test.
10. Direct shear test.
11. Determination of CBR value.
12. Only Demonstration - Determination of Relative density – Sand, Vane shear test. Odometer test(Consolidation)

REFERENCE BOOKS:

1. Alamsingh - Geotechnical manual,
2. Basic and Applied Soil Mechanics- GopalRanjan and Rao A.S.R. (2000), New Age International (P) Ltd., New Delhi
3. Shamsherparekh – Geotechnical Manual.
4. Manual of Soil Laboratory Testing- Head K.H., (1986)- Vol. I, II, III, Princeton Press, London
5. Relevant BIS codes.

BTCE15F6100	Transportation Engg-II	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Transportation Engg-1

Course Objectives:

1. To educate students about the importance of materials used in highways, basic laboratory testing of these materials, their requirements and criteria for selection for highway works.
2. To make students familiar with different bituminous mix design procedures commonly adopted, the method of deciding gradation requirements.
3. To make students appreciate the design methodologies adopted for designing flexible and rigid pavements for both new and overlay constructions.
4. To give students an overview of the different drainage measures, failures in pavements and methods of maintenance of pavements

Course Outcomes:

On successful completion of this course, students should be able to:

1. Explain: the requirements and selection criteria of highway materials, basic methods of testing the highway materials and interpretation of results in comparison with standard IRC codes.
2. Describe, analyze and compute: requirements of gradation for bituminous mixes, design aggregate gradation of bituminous mixes, conduct mix design and determine volumetric properties of bituminous mixes as per IRC and AASHTO standards
3. Discuss and compute: design factors of design of pavements, thickness design of new pavements for flexible and rigid pavements, design of overlay for pavement up gradation.
4. Enumerate: requirements of drainage systems and design procedures for drains, types of failures occurring in pavements and method of maintenance of pavements

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F5 300	CO1	**3**	**3**				**2**	**3**	**3**	**3**	**3**		**1**	**3**	**3**	**2**	**3**
	CO2	**3**	**3**	**3**	**2**	**1**	**2**	**2**	**3**	**2**	**2**			**3**	**2**	**3**	**3**
	CO3	**3**	**3**	**3**	**3**		**2**	**3**	**3**	**3**	**3**	**1**	**2**	**3**	**3**	**2**	**2**
	CO4	**3**			**3**	**3**	**3**	**3**	**2**	**2**	**3**		**2**	**3**	**3**		**1**

UNIT – 1

Soil: importance and desirable properties of subgrade soil, HRB method of soil classification, – numerical examples. **Aggregates:** Requirements, properties and tests on road aggregates. **Bitumen and modified bitumen:** Requirements, properties and tests, criterion for selection of different binders. **Emulsions and Cutbacks:** Preparation, characteristics, uses and tests.

UNIT – 2

Bituminous Mixes: Requirements of bituminous mixes, Mechanical properties and tests, dense and open textured mixes, General design of bituminous mixes, design methods using Rothfuch's method only, Bituminous mix design methods – Marshall method and Superpave method, Numerical problems - numerical examples.

UNIT – 3

Design: Design factors, CBR method of flexible pavement design as per IRC 37 guidelines, Design of CC pavement as per IRC 58 guidelines, design of joints, dowel bars and tie bars, Overlay design of pavements as per IRC 81 guidelines, Numerical problems on above- numerical examples.

UNIT – 4

Drainage: design and construction of surface and sub-surface drainage system for highways, drainage materials, design procedures and IRC guidelines for drainage of urban roads, **Failures:**

General causes, different types of failures in flexible and rigid pavements, **Maintenance:** methods of maintenance of different types of pavements, special repairs

REFERENCE BOOKS:

1. S K Khanna, C E G Justo and A Veeraragavan, "Highway Engineering", Revised 10th Edition, Nemchand and Bros, Roorkee
2. L.R.Kadiyali and Lal, "Principles of Highway Engineering", Khanna publishers, New Delhi
3. K P Subramanium "Transportation Engineering", Scitech publications, Chennai
4. R Sreenivas Kumar "Highway Engineering", University Press, Pvt. Ltd. Hyderabad
5. S K Khanna, C E G Justo and A Veeraragavan, "Highway Material and Pavement Testing Laboratory Manual", Revised 5th Edition, Nemchand and Bros, Roorkee
6. Relevant IRC and AASHTO codes

BTCE15F6200	Geotechnical Engg-II	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Basic knowledge of Engineering Mechanics, Strength of Materials and Fluid Mechanics and Structural Analysis.

Course Objectives:

1. To create an ability to apply knowledge of geotechnical engineering;
2. To analyze and interpret data related to designing foundations and earth retaining structures using geotechnical principles;
3. To analyse the stresses and bearing capacity of soils.

Course Outcomes:

The students will able to,
1. To examine the subsurface of the earth.
2. To analyse the earth pressure
3. To determine Bearing capacity and stresses in the soils.
4. To design the Various foundations

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
	CO1	3	3	1	3	2	2	1			2			3	3	3	2

BTCE 15F6 200	**CO2**	**3**	**2**	**1**	**3**		**2**	**1**			**2**			**3**	**3**	**3**	**2**
	CO3	**3**	**2**	**3**	**3**		**2**	**1**			**2**			**3**	**3**	**3**	**1**
	CO4	**3**	**2**	**3**	**3**		**2**	**1**			**2**			**3**	**3**	**3**	**2**

Course Contents:

UNIT1:SUBSURFACE EXPLORATION: Importance of exploration program, Methods of exploration: Boring, Seismic refraction method of grophysical exploration, Types of samples - undisturbed, disturbed and representative samples, Samplers, sample disturbance, area ratio, Recovery ratio, clearance, Stabilisation of boreholes - Typical bore log. Number and depth of borings for various civil engineering structures, soil exploration report. **DRAINAGE AND DEWATERING:** Determination of ground water level by Hvorselev's method, Control of ground water during excavation: Dewatering - Ditches and sumps, well point system, Vacuum method, Electro- Osmosis method.

12 hours

UNIT II:LATERAL EARTH PRESSURE: Active and Passive earth pressures, Earth pressure at rest. Rankine's and Coulomb's Earth pressure theories-– Graphical solutions for active earth pressure (cohesionless soil only) – Culmann's and Rebhann's methods, Lateral earth pressure in cohesive and cohesionless soils, **STABILITY OF EARTH SLOPES:** Types of slopes, causes and type of failure of slopes. Definition of factor of safety, Stability of infinite slopes, Stability of finite slopes by Methodof slices and Friction Circle method, Taylor's stability number, Fellineous method,.

12 hours

UNIT III:STRESSES IN SOILS: Boussinesq's and Westergaard's theories for concentrated, circular and rectangular loads. Comparison of Boussinesq's and westergaard's analysis. Pressure distribution diagrams, Contact pressure, Newmark's chart. **BEARING CAPACITY AND SHALLOW FOUNDATION** Introduction – Bearing capacity- definition – types of shear failure – Bearing capacity of shallow foundation on homogeneous deposits - Methods: Terzaghi's , Skempton's and BIS methods – Effect of water table on bearing capacity – Plate load test – Bearing capacity from in-situ tests - SPT, SCPT and plate load test –Types of foundation – contact pressure distribution below isolated footing –

12 hours

UNIT IV:FOUNDATION SETTLEMENT: Importance and Concept of Settlement Analysis, Immediate, Consolidation and Secondary settlements (no derivations, but, computation using relevant formula for Normally Consolidated soils), Tolerance. BIS specifications for total and differential settlements of footings and rafts.

PROPORTIONING SHALLOW AND PILE FOUNDATIONS Allowable Bearing Pressure, Factors influencing the selection of depth of foundation, Factors influencing Allowable Bearing Pressure, Factors influencing the choice of foundation, Proportioning isolated, combined, strip and mat foundations, Classification of pile foundation, Pile load capacity, Proportioning pile foundation

12 hours

TEXT BOOKS:

1. Alam Singh and Chowdhary G.R. **Soil Engineering in Theory and Practice**, CBS Publishers and Distributors Ltd., New Delhi-1994.

2. Punmia B.C. **Soil Mechanics and Foundation Engg,** 16th Edition Laxmi Publications Co. New Delhi2005.
3. Bowles .J.E**, "*Foundation analysis and design*",** McGraw Hill, 2001.
4. Murthy .V.N.S**, "*Textbook of Soil Mechanics and Foundation Engineering*",** CBS Publishers and Distributors, New Delhi, 2009.

REFERENCES BOOKS:

1. Gopal Ranjan and Rao A.S.R. **Basic and Applied Soil Mechanics**, New Age International (P) Ltd., Newe Delhi, 2000.
2. Venkatrahmaiah C.**Geotechnical Engineering**, 3rd Edition New Age International (P) Ltd., Newe Delhi, 2006.
3. Craig R.F. **Soil Mechanics**, Van Nostrand Reinhold Co. Ltd, 1987.
4. Braja M. Das **Principles of Geotechnical Engineering**- (2002), 5th Edition, Thomson Business Information India (P) Ltd., India.
5. Iqbal H. Khan **Text Book of Geotechnical Engineering**- (2005), 2nd Edition, PHI, India

BTCE15F6300	Design of Steel Structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Basic Structural Analysis

Course Objectives:

4. To learn about the concepts and principles of limit state design of steel structures
5. To learn about the provisions of I.S.Codes 800, 875
6. To learn about the concepts and principles of plastic analysis
7. To analyze statically indeterminate beams by plastic methods
8. To analyze and design bolted and welded connections
9. To analyze and design tension members
10. To analyze and design compression members (laced and battened) including splices etc.
11. To design column bases and foundation
12. To design laterally supported beams

Course Outcomes:

At the end of the course, the student
1. Has learnt about the concepts and principles of limit state design of steel structures Has learnt about the provisions of I.S.Codes 800, 875
2. Has learnt about the concepts and principles of plastic analysis, Is able to analyze statically indeterminate beams by plastic methods
3. Is able to analyze and design bolted and welded connections, Is able to analyze and design tension members

4. Is able to analyze and design compression members (laced and battened) including splices etc., Is able to design column bases and foundation, Is able to design laterally supported beams

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 300	CO1	3	3	1	3	2	2	1			2			3	3	3	2
	CO2	3	2	1	3		2	1			2			3	3	3	2
	CO3	3	2	3	3		2	1			2			3	3	3	1
	CO4	3	2	3	3		2	1			2			3	3	3	2

Course Contents:

UNIT-1

Introduction to Plastic Analysis: Introduction, Plastic theory, Plastic hinge concept, Plastic collapse load, Shape factor, conditions of plastic analysis, upper bound, lower bound and uniqueness theorems, Methods of Plastic analysis, Plastic analysis of statically indeterminate beams including continuous beams.

Introduction: Advantages and Disadvantages of Steel structures, Loads and Load combinations, Design considerations, Limit State Method (LSM) of design, Failure criteria for steel, Codes, Specifications and section classification.

UNIT-2

Bolted Connections: Introduction, Behaviour of Bolted joints, Design strength of ordinary Black Bolts, Design strength of High Strength Friction Grip bolts (HSFG), Pin Connections, Simple Connections, Moment-resistant connections, Beam to Beam connections, Beam and Column splices, Semi rigid connections

Welded connections: Introduction, Welding process, Welding electrodes, Advantages of Welding, Types and Properties of Welds, Types of joints, Weld symbols, Weld specifications, Effective areas of welds, Design of welds, Simple joints, Moment resistant connections, Continuous Beam to Column connections, Continuous Beam to Beam connections, Beam Column splices, Tubular connections

UNIT-3

Design of Tension Members: Introduction, Types of tension members, Design of strands, Slenderness ratio, Behaviour of tension members, Modes of failure, Factors affecting the strength of tension members, Angles under tension, Other sections, Design of tension member, Lug angles, Splices, Gussets.

Design of Compression Members: Introduction, Failure modes, Behaviour of compression members, Elastic buckling of slender compression members, Sections used for compression members, Effective length of compression members, Design of compression members, laced and battened built up columns. Column splices.

UNIT-4

Design of Column Base and Foundation: Design of simple slab base and gusseted base, Design of foundation.

Design of Beams: Introduction, Beam types, Lateral stability of beams, factors affecting lateral stability, Behaviour of simple and built-up beams in bending(without vertical stiffeners), Design strength of laterally supported beams in Bending, Design strength of laterally unsupported beams, Shear strength of steel beams, Maximum deflection, Design of laterally supported beams.

References:

1. N Subramanian, Design of Steel Structures, Oxford,2008
2. Duggal,Limit State Design of Steel Structures, Tata Mcgraw Hill 2010
3. Bhavikatti,Design of Steel Structures , I.K. International Publishing House Pvt. Ltd
4. Pasala Dayaratnam S. Design of Steel Structures, Chand, 1999
5. Bureau of Indian Standards, IS800-2007, IS 875-1987
6. Steel Tables

BTCE15F6400	Estimation and Project Management	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

A thorough knowledge of the subject Building planning and drawing.

Course Objectives:

To learn study various drawing with estimates, methodsof taking out quantities and preparation of detailed and abstract estimates for different civil engineering works. To learn about specifications and carry out rate analysis, measurement of earth work. Importance and significance of various terms related to contracts. Basics and importance of project management.

Course Outcomes:

Students will learn how to study the

1. various drawings and taking out quantities,
2. Work out the cost and preparation of abstract for the estimated cost for the various civil engineering works, how to write specifications, c
3. Carry out rate analysis, obtain measurement of earth work for roads by various standard methods and preparation of contract document related to a project.
4. Documents preparation for tenders.
5. **Mapping of Course Outcomes with programme Outcomes**

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O2	PS O3	PS O4
BTCE 15F6 400	CO1	1	2	3		1		2	1	2				3	3	2	3
	CO2	1	2	3		1			1	2				3	3	3	2
	CO3	3	1	3		1				1				3	3	3	1
	CO4	3	1	3		1		1		1				3	3	3	2

Course Contents:

UNIT1:ESTIMATION: Study of various drawings with estimates, important terms, units of measurement, abstract Methods of taking out quantities and cost –center line method, long and short wall method or crossing method. Preparation of detailed and abstract estimates for the following Civil Engineering works – Buildings – RCC framed structures with flat, sloped RCC roofs with all Building components

UNIT2:ESTIMATE: Different type of estimates, approximate methods of estimating buildings, cost of materials. Estimation of wooden joineries such as doors, windows & ventilators.
ESTIMATES: Steel truss (Fink and Howe truss), manhole and septic tanks, RCC Culverts.
SPECIFICATIONS: Definition of specifications, objective of writing specifications, essentials in specifications, general and detail specifications of common item of works in buildings.

UNIT3:RATE ANALYSIS: Definition and purpose. Working out quantities and rates for the following standard items of works – earth work in different types of soils, cement concrete of different mixes,

bricks and stone masonry, flooring, plastering, RCC works, centering and form work for different RCC items, wood and steel works for doors, windows and ventilators.

MEASUREMENT OF EARTHWORK FOR ROADS: Methods for computation of earthwork – cross sections – mid section formula or average end area or mean sectional area, trapezoidal &prismoidal formula with and without cross slopes.

UNIT4:CONTRACTS: Types of contract – essentials of contract agreement – legal aspects, penal provisions on breach of contract. Definition of the terms –Tender, earnest money deposit, security deposit, tender forms, documents and types. Acceptance of contract documents. Termination of contract, completion certificate, quality control, right of contractor, refund of deposit. Administrative approval – Technical sanction. Nominal muster roll, measurement books – procedure for recording and checking measurements – preparation of bills. Valuation- Definitions of various terms, method of valuation, Freehold & Leasehold properties, Sinking fund, depreciation and method of estimating depreciation, Outgoings.

Project management- Introduction, meaning, nature and characteristics, scope and functional areas, rolls, levels, development of management and modern management approaches.

REFERENCE BOOKS:

1. B. N. Dutta, Estimating & Costing, Chand Publisher
2. P.L. Basin S. Quantity Surveying- Chand : New Delhi.
3. S.C. Rangwala Estimating & Specification Charotar publishing house, Anand.
4. G.S. Birde, Text book of Estimating & Costing- DhanpathRai and sons : New Delhi.
5. D.D. Kohli and R.C. Kohli S A text book on Estimating, Costing and Accounts Chand : New Delhi.
6. B. S. Patil, Contracts and Estimates, University Press, 2006.

BTCE15F6510	Design of Hydraulic structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Fluid Mechanics and Hydrology & Irrigation Engineering

Course Objectives:

1. The reservoir planning and various reservoir operations.
2. About analysis and design of gravity dam
3. About salient features of earth & rock fill dams, and seepage analysis
4. Types and salient features of spillways and energy dissipation below spillways

Course Outcomes:

1. Analyse the requirements and techniques for reservoir operations
2. Analyse and design high and low gravity dams
3. Identify the suitable methods for seepage control through earth and rock fill dams.
4. Suggest suitable type of spillway and its capacity or a given condition

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 510	CO1	3	2	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO4	3	2	3	1	-	-	-	-	2	-	-	3	3	3	3	3

UNIT 1:RESERVOIR PLANNING: Introduction, classification of reservoir, Storage zones of a reservoir, masscurve, fixing capacity of a reservoir, safe yield, problems, density currents,trap efficiency, reservoir sedimentation, life of a reservoir, economic heightof a dam, problems, environmental effects of reservoir, diversion head works- introduction and component parts. Cross drainage works- introduction and types.

Unit 2:GRAVITY DAMS: Introduction, forces on a gravity dam, stress analysis in gravity dams,problems, combination of forces for design. Elementary and practicalprofiles of a gravity dam, stability analysis (without earthquake forces),problems, galleries in gravity dams.

UNIT 3: EARTH AND ROCKFILL DAMS: Introduction, types of earth dams, construction methods, design criteria forearth dams, causes of failure of earth dams, section of dam, preliminarydesign criteria, problems, control of seepage through earth dams, safetymeasures.Rockfill damsand its components.

UNIT4:SPILLWAYS: Introduction, types and energy dissipation below spillways

TEXT BOOKS:

1. R.K. Sharma, Text book of irrigation Engineering & Hydraulic Structures –Oxford & IBH Publishing Company, New Delhi (2002).

2. G.L. Asawa, Irrigation and Water Resources Engineering –New Age International Publishers, New Delhi (2005).
3. Modi P.N., Irrigation, Water Resources and Water Power Engineering –Standard Book House, New Delhi.
4. C. Sathyanarayana Murthy, Design of Minor Irrigation and Canal Structures –New Age International Publishers, New Delhi.

REFERENCE BOOKS:

1. Garg, S.K., Irrigation Engineering & Hydraulic Structures –Khanna Publishers, New Delhi.
2. Madan Mohan Das & Mimi Das Saikia, Irrigation and Water Power Engineering –PHI Learning Pvt. Ltd., New Delhi (2009).

BTCE15F6520	Earth & Rock fill Dams	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Soil mechanics, Hydrology & Irrigation Engineering

Course Objectives:

1. The reservoir planning and various reservoir operations.
2. About analysis and design of gravity dam
3. About salient features of earth & rock fill dams, and seepage analysis
4. Types and salient features of spillways and energy dissipation below spillways

Course Outcomes:

1. Enumarate the types of dams
2. Analyse and design of earth dams with suitable foundations
3. Identify the suitable methods for seepage control through earth and rock fill dams.
4. Suggest suitable ways to construct the embankments

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 520	CO1	3	2	2	-	-	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	2	3	2	-	-	-	-	2	-	-	3	3	3	3	3
	CO4	3	2	3	1	-	-	-	-	2	-	-	3	3	3	3	3

UNIT I: INTRODUCTION-Types of dams, Homogeneous earth Dams, Zoned Earth dams, Rockfill Dams. Typical Embankment, Dam sections, Site selection and exploration, Influence of topography and subsoil conditions on location and alignment of the dam. Foundation sub surface exploration and studies of embankment construction material.

DESIGN OF EARTH DAMS-Material available for embankment construction, character of foundation, climate, shape and size of the valley, River diversion, probable wave action time available for construction function of reservoir and earthquake activity, location and inclination of earth core & shell materials, embankment side slopes, free board and crest width. Filter Zones, Design provisions Draw down pore pressures. Berms, Upstream and down stream slope protection. Internal drainage systems, Seismic design considerations, ground movements, seiches, problems in loose sand and soft clay.

UNIT II:EARTH DAMS ON PERVIOUS FOUNDATION SOIL-Methods of foundation treatment, preventing under seepage with complete vertical barriers and grouting, Reducing under seepage with partial vertical cutoffs and horizontal upstream impervious blankets, controlling under seepage by regulation of leaks and relief wells.

STABILITY ANALYSIS-Stability of infinite slopes. Zones of planes of weakness in foundation, stability analysis of embankment by Taylor's method, Swedish' method including side forces between slices, simplified method suggested by Sherard et. Al., Morgensterm-price method, wedge method, Zone of planes of weakness in foundation, stability during construction, full reservoir and drawdown, settlement and horizontal movements. Special design problems and details

UNIT III:MEASUREMENTS OF PORE WATER PRESSURE AND MOVEMENTS-Purposes and types of instruments, piezometer, devices for measuring movements, USBR measurements of pore water pressure and embankments compression, compression of rock fill embankment sections, during construction and post construction foundation settlement, foundation spreading, observation and measurement of leakage.

TREATMENT OF ROCK FOUNDATIONS AND ABUTMENTS-Types of rock, foundation object of grouting, evaluation of necessity of grouting, planning grouting details, blanket grouting, drilling equipment, size and direction of holes, washing and pressure testing of holes, grouting equipment, procedures for grouting, pressure and consistency of grout, stopping surface leakage, surface treatment of rock foundation and abutments. Earth compaction against rock foundations and abutments, grouting through completed earth embankments, drainage holes, grouting and drainage galleries.

UNIT IV:EMBANKMENT CONSTRUCTION-Equipments for excavating, hauling spreading, blending, compacting and separating over sized rocks and cobbles, construction procedures and quality control of impervious and semi pervious embankments sections, handing dry and wet materials.

Construction procedures and quality control of pervious embankment sections, construction problems caused by fines, construction procedures of hard and soft rockfill embankments, field test on rockfill embankments, slope treatment and riprap.

References

1. Sherard, J.L., Woodward, R.J., Gizienski, S.F. and Clevenger, W.A. Earth and earth-rock dams, John Wiley & Sons, New York., 1963
2. Sowers, G.P. and Sally, H.L. Earth and rockfill dam engineering, Asia Publishing House, New Delhi., 1970
3. Creager, W.P., Justin, J.D. and Hinds, J. Engineering for dams, John Wiley & Sons, New York., 1945.
4. Earth & Rock fill dams – Principles of design and construction by Christian Kutzner Published Oxford and IBH
5. Design of small dams – united states department of the Interior Bureau of Reclamation Published by Oxford and IBH Publishing Company
6. Earth Manual – CBS Publishers and distributors
7. E.N.Bromhead The stability of slopes published by Blackie Academic and Professional
8. Earth and Rock fill dams by Sherad
9. Bharat Singh Earth and Rock fill dams
10. Winterkorn and Fang Foundation Engineering Hand Book,

BTCE15F6610	Repair & rehabilitation of structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Concrete Technology & Alternative Building Materials

Course Objectives:

1. To learn about causes of deterioration of structures, the investigation and methods of diagnosis of damaged structures and Quality assurance for concrete properties.
2. To learn about influence on serviceability and durability properties of concrete, cause of corrosion and methods to prevent corrosion. Importance and protective measures on various aspects of maintenance.
3. To learn about Inspection, Assessment procedure for evaluating a damaged structure and materials used for repair of damaged structure
4. To learn about techniques for repair , case studies

Course Outcomes:

1. Identify the causes of deterioration of structures, diagnosis of damaged structures by using various methods and capable of maintaining Quality assurance for concrete properties.
2. Examine influence on serviceability and durability properties of concrete, should give preventive measures of corrosion control by various methods.
3. Asses and evaluate the damaged structure by using suitable materials.
4. Identify techniques for repair with the help of different case studies

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 610	CO1	3	2	3	2		2	1	2		3	2		3	3		3
	CO2	3	2	2	3	3	2	3	1	2	3	1	2	3	3	1	3
	CO3	3	3	3	1	3	1	1		1	2	3	2	3	3	1	3
	CO4	2	3	3	2	3	2	3	2	1	1	1	2	3	3	3	3

Course Contents:

UNIT-1: General:

Introduction, cause of deterioration of concrete structures, diagnostic methods and analysis, preliminary investigations, experimental investigations using NDT, load testing, corrosion mapping, core drilling, partial destruction techniques and other instrumental methods.

Quality assurance for concrete construction, concrete properties- strength, permeability, thermal properties and cracking,

UNIT-2: Influence on Serviceability and Durability:

Effects due to climate, temperature, chemicals, wear and erosion, Design and construction errors, corrosion mechanism, Effects of cover thickness and cracking, Methods of corrosion protection, corrosion inhibitors, corrosion resistant steels, coatings, cathodic protection.

Maintenance and Repair Strategies:

Definitions, Maintenance, Repair and rehabilitation, Facets of maintenance, Importance of maintenance, Protective measures on various aspects.

UNIT-3: Inspection, Assessment procedure for evaluating a damaged structure, causes of deterioration, testing techniques

Materials for repair:
Special concretes and mortars, concrete chemicals, special elements for accelerated strength gain, Expansive cement, polymer concrete, sulphur infiltrated concrete, ferro-cement, Fibre reinforced concrete.

UNIT-4: Techniques for repair:
Rust eliminators and polymer coating for rebars during repair, foamed concrete, dry pack technique, vacuum concrete, Gunite and Shotcrete, Epoxy injection, Mortar repair for cracks, shoring and underpinning.

Examples of repair to structures:

Repairs to overcome low member strength, Deflection, Cracking, Chemical disruption, weathering, wear, fire, leakage and marine exposure, engineereddemolition techniques for dilapidated structures, Case studies.

REFERENCE BOOKS:

1. Sidney, M. Johnson, Deterioration, Maintenance and Repair of Structures McGraw- Hill, London.
2. Denison Campbell, Allen & Harold Roper, Concrete Structures – Materials, Maintenance and Repair Longman Scientific and Technical, London.
3. R.T.Allen and S.C. Edwards, Repair of Concrete Structures, Blakie and Sons, Hampshire.
4. B.Vidiveli, Rehabilitation of concrete structures Standard Publishers & Distributors, New Delhi.
6. B.L Gupta & Amit Gupta, Maintenance Repair of Civil Structures Standard Publishers & Distributors, New Delhi.
7. P.S Gahlot & Sanjay Sharma, Building Repair and Maintenance Management, CBS Publishers & Distributors Pvt. Ltd., New Delhi.
8. P Davaratnam. N.V Ramana Rao, Maintenance and Durability of concrete structures" Universities Press (India), 1997.
9. M.S.Shetty, Concrete Technology - Theory and Practice, S.Chand and Company, NewDelhi.

BTCE15F6620	Structural Dynamics	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Engineering Mechanics, Structural Analysis - I

Course Objectives:

1. To learn about the basic concepts and principles of vibration and mathematical modeling

2. To analyze free vibration of SDOF systems (undamped and damped)

3. To analyze forced vibration of SDOF systems (undamped and damped) due to harmonic and general loading functions including support excitation

4. To learn about the principles and use of vibration measuring instruments

5. To analyze free and forced vibration of MDOF systems (undamped and damped)

6. To analyze the free vibration of continuous systems such as rods and beams

Course Outcomes:

At the end of the course, the student

1. Understand the principles of Structural Dynamics and damping in structures.
2. Summarize the Solution techniques for dynamics of single degree of freedom systems.
3. Understand the principles of engineering seismology.
4. Understand the concepts of earthquake resistance of reinforced concrete buildings.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 620	CO1	2	3	1										2	3		
	CO2		2	2										3		1	2
	CO3	1	2					1						2		1	
	CO4	1	2	1										2			1

Course Contents:

UNIT – 1:Introduction to structural dynamics: Brief history of vibration, Mathematical modeling, basic definitions, simple harmonic motion. D' Alembert's principle, principle of virtual work.

Free vibration of single degree of freedom system: Undamped and damped systems, viscous and Coulomb damping, logarithmic decrement, Evaluation of damping, response to initial conditions, Numerical problems.

UNIT – 2:Forced vibration of single degree freedom systems: Undamped and damped systems, response to harmonic loading, rotating unbalance, reciprocating unbalance. Duhamel's integral, response due to general system of loading, impulsive loadings, dynamic load factor, response spectrum, response of SDOF subjected to harmonic base excitation, vibration isolation and transmissibility, Principle of vibration measuring instrument, Numerical problems.

UNIT – 3:Free vibration of multi degree of freedom systems: Shear buildings modeled as multi degree of freedom systems, natural frequencies, normal modes, orthogonality property of normal modes, modal matrix, Numerical problems.

Forced vibration of multi degree of freedom systems: modal superposition method, response of MDOF systems to harmonic forced excitation, Numerical problems.

UNIT – 4:Free vibration of continuous systems: Longitudinal vibration of uniform bars, derivation of expression, natural frequencies for various boundary conditions, Transverse vibration of uniform beams, derivation of expression, natural frequencies and mode shapes for various boundary conditions.

REFERENCE BOOKS:

1. Mario Paz, Structural Dynamics CBS publishers, New Delhi.
2. W.T.Thomson, Theory of Vibrations with Applications CRC Press
3. M. Mukhopadhaya, Vibrations, Structural dynamics- Oxford IBH, Delhi.
4. Anil Chopra, Structural Dynamics PHI Publishers, Delhi.
5. Clough & Penzen, Structural Dynamics TMH, Delhi.
6. G K Grover, Mechanical Vibrations Nemchand & Bros, Roorkee, India.
7. John M Biggs, Structural Dynamics McGraw-Hill Book Co.

BTCE15F6630	Earth & Earth Retaining Structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Basic knowledge of Engineering Mechanics, Strength of Materials, Fluid Mechanics, Basic geotechnical engineering and Structural Analysis

Course Objectives:

1. Understand the classification of ERS based on load support mechanism,
2. Understand the different types of retaining walls.
3. Understand the various Construction methods of Sheet pile walls.
4. Understanding of the basic principles involved in various techniques of Soil. Nailing.

Course Outcomes:

1. An ability to analyse and design independently common earth retaining structures

2. At the end of this course students are expected to gain an appreciation on the most common retaining wall types available in the industry worldwide.
3. The students will know how to tackle basic retaining wall problems and have the ability to design detaining walls based on Lateral Earth Pressure Theory.
4. The students will also have an appreciation of wall movements and potential impact on the surrounding structures.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 630	CO1	**3**	**1**	**1**	**2**					**1**				**3**	**3**	**3**	**3**
	CO2	**2**	**2**	**2**	**1**		**1**				**1**		**1**	**3**	**3**	**3**	**3**
	C03	**3**	**3**	**2**	**2**			**1**			**1**	**1**		**3**	**3**	**3**	**3**
	CO4	**3**	**3**	**2**	**2**			**1**			**1**	**1**		**3**	**3**	**3**	**3**

Course Content:

UNIT – 1: Introduction to earth retaining structures, Necessity of ERS, classification of ERS based on load support mechanism, construction concept, system rigidity and service life. ERS selection methods, factors affecting ERS selection, Rankine's and Coulomb's Earth pressure theories for cohesive and cohesionless soils, Influence of movement on earth pressure stresses due to compaction and surcharge loads. **12hrs**

UNIT – 2 : Soil properties and lateral Earth pressure. Earth pressures on walls, various types of back fill and condition of loading. Soil tension effects and rupture zones. Effect of flexibility of structures on lateral pressure. Earth pressures due to earthquakes. Conventional Retaining Wall: Types of retaining walls, Stability (sliding, overturning, bearing capacity & overall) of gravity and cantilever walls, Proportioning of retaining walls, Backfill material and drainage.

12hrs

UNIT – 3: Flexible Walls: Sheet pile walls, Construction methods- Cantilever and Anchored sheet pile wall. Reinforced Soil Walls/Mechanically Stabilised Earth: - Failure mechanisms bond and rupture failures, Analysis methods, Limit equilibrium method- Internal and external stability, Static and seismic analyses. **12hrs**

UNIT – 4: Analysis and design of cantilever and anchored sheet pile walls. Braced Cuts and Soil Nailing: Lateral earth pressure in braced cuts, Design of various components, Stability of braced cuts, base heave and stability, yielding and settlement of ground surrounding excavation, Diaphragm walls – slurry support; Soil Nailing. **12hrs**

REFERENCE BOOKS:

1. Braja M. Das Principles of Foundation Engineering.
2. Bowles, Foundation analysis and design –JE – McGraw Hill.
3. Terzaghi, K and Rolph, B.peck Soil Mechanics in Engineering Practice 2nd Edn.John Wiley &Co.
4. Analysis and Design of Foundations and Retaining Structures, Mearut.
5. Prakash, S – SarithaPrakashan, Winterkorn, H.F. and Fang, H.Y., Foundation Engineering Handbook, Galgotia Book- source, 2000.
6. Rowe, R.K., Geotechnical and Geoenvironmental Engineering Handbook, Kluwer Academic Publishers, 2001.
7. Militisky, J. and Woods, R., Earth and Earth retaining structures, Routledge, 1992.
8. Koerner, R.M., Design with Geosynthetics (Third Edition), Prentice Hall, 1997.
9. Day, R.W., Geotechnical and Foundation Engineering: Design and Construction, McGraw Hill, 1999.
10. Das, B.M., Principles of Geotechnical Engineering (Fourth Edition). The PWS series in Civil Engineering, 1998

BTCE15F6640	Transportation Economics	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

NONE

Course objectives:

1. To give the students an overview of Economics, its basic terms and concepts, and discuss various types of costs and benefits that economist discuss in transport projects.
2. To educate students the importance of transport economic analysis and edify the basic methods of economic analysis carried for transportation engineering projects.
3. To make the students capable of recognizing a project from different methods of economic analysis by identifying the limitations of each method.
4. To give the students an introduction to transport demand and elasticity concept make to make them capable to forecast demand for transport services

Course outcomes:

1. Elucidate the elements of transport economics: highway transportation costs, rroad user costs and benefits.

2. Explain the economic evaluation of null alternative, methods of analysis when applied to a group of mutually exclusive alternatives, depreciation cost, accounting methods, salvage value estimation, depreciation, taxes.

3. Associate characteristics and limitations of the different methods of economic analysis, ranking of independent projects, sensitivity analysis.

4. Enumerate factors affecting demand and supply, shift in demand and supply, transportation demand model, consumer surplus, marginal cost, average cost

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 640	CO1	**3**	**1**	**1**	**2**					**1**				**3**	**3**	**3**	**3**
	CO2	**2**	**2**	**2**	**1**		**1**				**1**		**1**	**3**	**3**	**3**	**3**
	C03	**3**	**3**	**2**	**2**			**1**			**1**	**1**		**3**	**3**	**3**	**3**
	CO4	**3**	**3**	**2**	**2**			**1**			**1**	**1**		**3**	**3**	**3**	**3**

UNIT – 1

Introduction: Concepts and Principles of Engineering Economics, Identification and Measurements of Highway Benefits, Highway Transportation Costs, Road User Costs and Benefits, Road User Cost Study in India. 12 hrs

UNIT – 2

Methods of Economic Analysis: Methods- BCR-NPV-IRR –Their Basic Characteristics, Illustrative applications on above Methods of Economic Analysis, Comparison of the Methods of Analysis when Applied to a Group of Mutually Exclusive Alternatives, Economic Evaluation of Null Alternative.

12 hrs

UNIT – 3

Depreciation Concepts: Depreciation Cost, accounting Methods, Salvage Value Estimation, Depreciation, Taxes, Problems. Characteristics and Limitations of the Different Methods of

Economic Analysis, Ranking of Independent Projects, Sensitivity Analysis. Case studies and problems. 12 hrs

UNIT – 4

Supply and Demand: Concept-Definition-Factors affecting Demand and Supply- Shift in Demand and Supply- Transportation demand Model- Equilibrium-Sensitivity of Travel Demand- Elasticities- Consumer Surplus- Marginal Cost- Average Cost- Pricing. 12 hrs

REFERENCE BOOKS:

1. Robley Winfrey,`**Economic Analysis for Highways'**, International Textbook Company, Pennsylvania.1990.
2. Kenneth J Button, **"Transportation Economics"**, Edward Elgar publishing
3. Jotin Khisty and Kent Lall '**Introduction to Transportation Engineering'** PHI, New Delhi,2001.
4. Kadiyali.L.R.' **Traffic Engineering and Transport planning'**, Khanna publications.
5. IRC: SP:30-1993, Manual on Economic Evaluation of Highway Projects in India.

Text Books:

1. Das, B.M., Principles of Geotechnical Engineering (Fourth Edition). The PWS series in Civil Engineering, 1998
2. Das, B. M. - Principles of Foundation Engineering
3. Bowles. J. E. - Foundation Analysis & Design
4. Militisky, J. and Woods, R., Earth and Earth retaining structures, Routledge, 1992. Clayton, C.R.I., Militisky, J. and Woods, R.I., Earth pressure and Earth-Retaining structures (Second Edition), Survey University Press, 1993

BTCE15F6650	Air and noise pollution	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Environmental Studies, Engineering Chemistry

Course Objectives:

1. To introduce source, classification, characterization and effects of air pollution.
2. To explain the meteorological definitions & air transport equations.
3. To introduce the sampling & pollution control matters and devices.
4. To demonstrate legislations and regulations pertinent to air pollution.

Course Outcomes:

1. Identify the sources of air pollution.
2. Identify the effects of air pollution on humans, vegetation, materials etc.
3. Solve problems on stack height, concentration of pollutants.
4. Identify the effects and control measures of air pollution due to automobiles

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 650	CO1	3	3	2	3	3		3					3	3	3	3	3
	CO2	3	3	2	3	2		3					3	3	3	3	3
	CO3	3	3	2	2	2		2					3	3	3	3	3
	CO4	3	3	2	2	2		2					3	3	3	3	3

Course Contents:

UNIT - I

INTRODUCTION: Definition – Classification and Characterization of Air Pollutants, Concentration of pollutants – Problems. Emission Sources, Behavior and Fate of air Pollutants, Chemical Reactions in the Atmosphere, Photo-chemical Smog, Coal-induced smog, Air Pollution Inventories. **EFFECTS OF AIR POLLUTION:** On Human Health, Animals, Plants and Materials – Major Environmental Air Pollution Episodes – London Smog, Los Angeles Smog & Bhopal Gas Tragedy.

UNIT – II

METEOROLOGY: Introduction – Meteorological Variables, Primary and Secondary Lapse Rate, Inversions, Stability Conditions, Windrose – pollution roses. General Characteristics of Stack Plumes, Meteorological Models. Numerical problems on Gaussian plume model, plume rise, stack height. Factors to be considered in Industrial Plant Location and Planning. Noise pollution – sources, measurement units, effects and control

UNIT – III

SAMPLING, ANALYSIS AND CONTROL: Sampling and Measurement of Gaseous and Particulate matter, Stack Sampling, Analysis of Air Pollutants, Smoke and Smoke Measurement, Air Pollution Control Methods – Particulate, Emission Control, Gravitational Settling Chambers, Cyclone Separators, Fabric Filters, Electrostatic Precipitators, Wet Scrubbers – numerical problems. Selection of a Particulate Collecting Equipment, Control of Gaseous Emissions, Adsorption by Liquids, Adsorption by Solids, Combustion Odours and their control.

UNIT – IV

AIR POLLUTION DUE TO AUTOMOBILES: Air Pollution due to Gasoline Driven and Diesel Driven Engines, Effects, Direct and Indirect Methods of control. **BURNING ENVIRONMENTAL ISSUES:** 1. Acid Rain 2. Global Warming 3. Ozone Depletion in Stratosphere 4. Indoor Air Pollution. **ENVIRONMENTAL LEGISLATION:** Environmental Policy, Environmental Acts, Water, Air and Noise Pollution Standards.

Reference Books:

1. Rao M N. and Rao H V N., "Air Pollution" Tata Mc Graw Hill Publishing Co. Ltd., New Delhi. 2004.
2. Boubel, R W., Donald, L.F., Turner, D.B., and Stern, A.C., "Fundamentals of Air Pollution" – Academic Press, 1994.
3. Crawford, M., "Air Pollution Control Theory" – Tata Mc Graw Hill Publishing Co. Ltd., New Delhi. 1980.
4. Henry C Perkins, "Air Pollution" – Tata Mc Graw Hill Publishing Co. Ltd., New Delhi. 1980.
5. Murali Krishna K V S G., "Air Pollution & Control" Kaushal & Co., 1995.
6. Peavy, H.S., Rowe, D.R., and Tchobanoglous, G., "Environmental Engineering" – Tata Mc Graw Hill Publishing Co. Ltd., New Delhi. 1986.
7. Sincero, A.P and Sincero, G.A., "Environmental Engineering – A Design Approach", Prentice Hall of India. 1999.
8. Wark, K., Warner, C.F. and Davies, W.T., "Air Pollution- Its Origin and Control", Harper & Row Publishers, New York. 1998.
9. Rao C S., "Environmental Pollution Control Engineering", New Age International, New Delhi. 2007.

BTCE15F6700	Extensive Survey Practice	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Hydrology & Irrigation ,Design of Hydraulic Structuresand Surveying practice lab

Course Objectives:

1. To apply knowledge of mathematics, science, and engineering to understand the measurement techniques.
2. To train the students under difficult and realistic situation of the surveying project.
3. To acquire a sound practical knowledge and application of theory and in practical to overcome the difficulties that could arise in field during surveying.
4. To impart training in the use of modern surveying instruments and to acquire a comprehensive idea of the project.

Course Outcomes:

1. Experiment the use of surveying instruments and performing various survey works in difficult terrain and to identify sites necessary for conducting various surveys.
2. Appraise the need for accurate and thorough note taking in field work to serve as a legal and produce the required maps and related calculations pertaining to survey work
3. Develop the adaptability in conversant with the camp life, to communicate with the local population, to develop team spirit, community living and self-management.
4. Adopt the working of Total station and Global Positioning System in the view of need for licensed surveyors.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 700	**CO1**	1	2	3				2	1					3	3	2	3
	CO2	1	2	3					1					3	3	3	2
	CO3	3	2											3	3	3	1
	CO4	3	2					1						3	3	3	2

Course Contents:

An extensive survey training involving investigation and design of the following projects is to be conducted for 2 weeks (14 days). The student shall submit a project report consisting of designs and drawings. (Drawings should be done using AutoCAD)

1. General instructions, Reconnaissance of the sites and fly leveling to establish bench marks.

2. NEW TANK PROJECT: The work shall consist of

i) Alignment of center line of the proposed bund, Longitudinal and cross sections of the center line.
ii) Capacity surveys.
iii) Details at Waste weir and sluice points.
iv) Canal alignment.

(At least one of the above new tank projects should be done by using TOTAL STATION)

3. WATER SUPPLY AND SANITARY PROJECT: Examination of sources of water supply, Calculation of quantity of water required based on existing and projected population. Preparation of village map

by any suitable method of surveying (like plane tabling), location of sites for ground level and overhead tanks underground drainage system surveys for laying the sewers.

4. HIGHWAY PROJECT: Preliminary and detailed investigations to align a new road (min. 1 to 1.5 km stretch) between two obligatory points. The investigations shall consist of topographic surveying of strip of land for considering alternate routes and for final alignment. Report should justify the selected alignment with details of all geometric designs for traffic and design speed assumed. Drawing shall include key plan initial alignment, final alignment, longitudinal section along final alignment, typical cross sections of road.

5. OLD TANK PROJECT: The work shall consist of

i) Alignment of center line of the existing bund, Longitudinal and cross sections of the centre line.

ii) Capacity surveys to explore the quantity.

Details at existing Waste weir and sluice points.

REFERENCE :

1. Punmia B C, Ashok K Jain, Arun K Jain, Surveying Vol 1, 2,3: Surveying, laxmi Publications (P) Ltd, New Delhi.
2. Duggal S.K., Surveying Vol 1, 2: McGraw Hill Educatiion(India) Pvt.Ltd.
3. P.N.Modi Irrigation, water Resources and water power Engineering- - standard book house, New Delhi.
4. ChallaSatya Murthy, Water Resources Engineering: Principles and Practice- New Age International Publishers, New Delhi (2nd Ed.)

BTCE15F6800	HHM Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Applied physics& Fluid mechanics

Course Objectives:

1. To understand the properties of fluid, types of fluid and the Types of flow.
2. To study about the flow measuring devices such as orifice meter, venturimeter.
3. To acquire knowledge about the flow through pipes.
4. To acquire the ability to critically observe/ examine and Measure the discharges through flow measuring devices

Course Outcomes:

1. Analyse various flow problems and fluid characteristics.
2. Apply Bernoulli's equations in flow experiments to determine the coefficient of discharge.
3. Determine the losses of flow through various mediums like pipes.
4. Determine hydraulic coefficients of notches and orifices

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F6 800	CO1	**3**	**3**	**2**	**3**	**3**	**-**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO2	**3**	**3**	**2**	**3**	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO3	**3**	**3**	**2**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**
	CO4	**3**	**3**	**2**	**2**	**2**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**3**	**3**	**3**	**3**

Course contents:

Hydraulics & Hydraulics Machinery Lab Experiments:

1.Calibration of V-Notch & Rectangular Notch.

2.Calibration of Broad Crested Weir.

3.Calibration of Venturi Flume.

4.Calibartion of Venturi Meter & Orifice Meter.

5.Determinations of Major & minor losses in pipe flow.

6.Determination of hydraulic coefficients of a vertical orifice.

7.Determination of vane coefficients for Flat , Inclined, semi-circular vanes.

8.Performance characteristics of a Single Stage Centrifugal Pump

9. Performance characteristics of a Pelton Wheel Turbine.

10. Performance characteristics of a Francis Turbine

REFERENCE BOOKS:

1. Fluid Mechanics & Machinery Laboratory Manual Prepared by School of Civil Engineering, REVA University, Bengaluru.

2. R.K.Bansal (2004), Fluid Mechanics & Hydraulic Machines; Laxmi Publication (P) Ltd, New Delhi.
3. Hydraulics and Hydraulic Machines Laboratory Manual –R.V.Raikar, PHI Learning Pvt.Ltd.

SYLLABUS VII SEMESTER

BTCE15F7100	Transportation Engineering-III	L	T	P	C	Hrs/Wk
Duration :16 Wks		2	1	0	3	4

Prerequisites:

Transportation-I, Transportation-II

Course Onjectives:

1. To educate students about the importance of highway planning, alignment, and introduce the concepts of highway geometric design.
2. To make students familiar with design elements: sight distance, horizontal curvature, super elevation, grades, visibility on vertical curves, cross section elements.
3. To educate students about the importance of traffic engineering as applied to road transportation and features of traffic characteristics.
4. To give students an overview of transport economics, quantifying various transport costs and benefits, identify the economic feasibility of transport projects.

Course Outcomes:

On successful completion of this course, students should be able to:

1. Explain: the elements and factors affecting geometric design of highways, skid resistance, camber, road margins; illustrate the importance of sight distance; analyze and compute safe stopping sight distance for various design speeds.
2. Describe, analyze and compute: safe overtaking sight distance, super elevation, extra widening of pavement along horizontal curves, horizontal transition curves and setback distances for various design speeds.
3. Outline the scope of traffic engineering, describe the road user characteristics, conduct various traffic studies and design the traffic control measures to the safe and efficient operation of traffic.
4. Identify and compute: the scope of transport economics, various methods of transport project economic cost analysis for determining the economic viable project.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
	CO1	3	1	1	2					1				3	3	3	3

BTCE 15F7 100	CO2	**2**	**2**	**2**	**1**		**1**				**1**		**1**	**3**	**3**	**3**	**3**
	C03	**3**	**3**	**2**	**2**			**1**			**1**	**1**		**3**	**3**	**3**	**3**
	CO4	**3**	**3**	**2**	**2**			**1**			**1**	**1**		**3**	**3**	**3**	**3**

UNIT – 1

Highway planning, location and alignment- Necessity of highway planning, classification of roads, road patterns, Basic requirements of an ideal alignment and factors controlling, engineering survey for highway location, steps in new alignment, necessity of realignment and steps, drawings and report. **Highway geometric design** – Introduction, highway cross-section elements.

UNIT – 2

Highway geometric design – Sight distances – stopping and overtaking sight distances- overtaking zone requirements, **Design of horizontal alignment** – speed, radius, super elevation, extra widening of pavements, transition curves, **Design of vertical alignmen**t – gradient, grade compensation, summit curves and valley curves, **Intersections** –at grade and grade separated intersections, channelization, Numerical examples.

UNIT – 3

Traffic engineering- introduction - traffic characteristics, **Traffic studies** – spot speed, speed and delay, origin and destination, traffic volume, parking, traffic capacity and level of service. **Traffic flow characteristics**. **Traffic operation -** traffic control devices – traffic signs, markings, traffic signals, design of isolated signals by Webster's method. Numerical examples using software on relevant topics

UNIT – 4

Scope of transportation economics, Transportation demand, Demand, supply and equilibrium, Sensitivity of travel demand, Factors affecting elasticities. **Introduction to highway economics** – cost and benefits, highway economic analysis – annual cost method, present worth method, rate of return method, benefit-cost ratio method, Numerical examples.

Text Books:

1. Khanna. S.K. and Justo. C.E.G., Highway Engineering, Nem Chand and Bros, Roorkee.
2. Kadiyali. L. R., Traffic Engineering and Transport planning, Khanna publishers, New delhi.
3. Patha Chakraborty and Animesh Das, Principles of Transportation Engineering, PHI learning.
4. Papacostas, C.A.,, Fundamentals of Transportation Engineering', Prentice-Hall of India Private Limited, New Delhi.
5. Ian G Heggie, Transportation Engineering Economics, McGraw Hill Book Co.
6. Relevant IRC codes

BTCE15F7210	Design & Drawing of RCC & Steel Structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	1	0	2	3

Prerequisites:

Knowledge Design of RCC Structural Elements ,Design of Steel Structures

Course Objectives:

1. The general layout of buildings and detailing of staircase and column footings
2. Design and detail cantilever type retaining walls, circular and rectangular water tanks resting on ground
3. The detailing of steel connections
4. The design and detailing of column splices and column bases

Course Outcomes:

1. Draw the general layout of buildings and detail staircase and column footings
2. Design and detail cantilever type retaining walls, circular and rectangular water tanks resting on ground
3. Design and detailing of steel connections
4. Design and detail column splices, lacing and battens ,column bases

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 210	CO1	2	1	1			2	3	1	1	1		2	3	3	2	1
	CO2	3	3	3			2	3	1	1	1		2	3	3	2	1
	CO3	3	3	3	1		2	3	1	1	1		2	3	3	3	1
	CO4	2	3	3	1		2	3	1	1	1		2	3	3	3	1

UNIT-1

Layout Drawing: General layout of building showing position of columns, footings, beams and slabs with standard notations, Detailing of Beam and Slab floor system, continuous beams, Detailing of Staircases: Dog legged and Open well.

Design and Detailing of Column footings: Column and footing (Square and Rectangle), Design and detailing of Rectangular Combined footing slab and beam type.

UNIT-2

Design and detailing of Cantilever type retaining walls.

Design and detailing of Circular and Rectangular water tanks resting on ground (Flexible base and Rigid base) using IS: 3370 (Part IV) only.

UNIT-3

Detailing of steel connections**:** Bolted and welded, beam-beam, Beam-column, seated, stiffened and un-stiffened.

Detailing of column **s**plices, Column-column of same and different sections. Columns, Lacing and battens.

Detailing of column bases**:** Slab base and gusseted base, grillage foundation.

UNIT-4

Design and drawing of roof truss (design forces in the members to be given)

REFERENCE BOOKS:

1. N. Krishna Raju, **Structural Design & Drawing Reinforced Concrete & Steel**- University Press, Delhi
2. Krishnamurthy **Structural Design and Drawing** - (Concrete Structures), CBS publishers, New Delhi. Tata Mc-Graw publishers.
3. B.C. Punmia – **Reinforced Concrete Structures** - Laxmi Publishing Co.
4. S.N.Sinha, **Reinforced Concrete Design –**Mc-GrawHill Education,
5. S.K. Duggal, ***Design* of *steel structures*** - Tata Mcgraw Hill, New *Delhi*
6. N. Subramanian **Design of Steel Structures** - Oxford University, Press.
7. Negi - **Design of Steel Structures** - Tata Mc Graw Hill Publishers.
8. Arya and Ajaman- **Design of Steel Structures** - Nem Chand &Bros. Roorkee.
9. S ***Unnikrishna*** Pillai & Devadas ***Menon Reinforced Concrete Design***-. Tata McGraw-Hill, New *Delhi*
10. IS: 456-2000, IS: 800 – 2007, SP(16)-1980, SP 6 (1) – 1984

BTCE15F7310	Design of precast & pre-stressed concrete structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Structural Analysis – I and Design of RCC Elements.

Course Objectives:

1. To understand the working principles of Prestressing.
2. To understand the different losses and deflections in Pre-stressing members.
3. To understand the failure pattern, designs of PSC beam.
4. Able to identify the requirements and applications of materials used in prefabricated structures.

Course Outcomes:

1. Familiar with the concepts, principles and methods of prestressing and able to compute the losses that occur in Prestressed concrete members.
2. To analyse the stresses in prestressed concrete beams at transfer and working condition and to compute the short-term and long-term deflections of Prestressed concrete beams.
3. To compute the ultimate flexural strength and shear strength of PSC beam sections and Design of PSC beams with the provisions of **IS: 1343-2012.**
4. Identify the suitable Pre-fabricated Elements required for Design

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 310	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

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Course Contents:

UNIT – 1

Materials: High strength concrete and steel, Stress-Strain characteristics and properties. Structural steel and bolts, Non-cementitious materials.

Precast Concrete: Definition of Precast concrete, Joints and connections: Basic mechanisms, Compression joints, Shear joints, Tension joints, Pinned-jointed connections, Moment resisting connections.

Basic principles of prestressing: Fundamentals, Load balancing concept, Stress concept, centre of thrust. Pre-tensioning and post-tensioning systems, Tensioning methods and end anchorages.

Analysis of sections for flexure: Stresses in concrete due to prestress and loads, stresses in steel due to loads, Cable profiles. Numerical problems.

UNIT – 2

Loss of prestress: Various losses encountered in pre-tensioning and post-tensioning methods, determination of jacking force. Numerical problems

Limit state of serviceability:

Deflection of prestressed members**,** Short term and long term deflections, deflections at transfer and working load conditions with different cable profiles. Deflection limits as per IS 1343. Effect of creep on deflection, load versus deflection curve, methods of reducing deflections.

Control of cracking.

UNIT – 3

Limit state of collapse: Codal provisions, Ultimate flexural strength of sections. shear resistance of sections, shear reinforcement.

Design of end blocks: Transmission of prestress in pretensioned members, transmission length, Anchorage stress in post-tensioned members. Bearing stress and bursting tensile force-stresses in end blocks-Methods, Codal provisions, Design of end blocks.

UNIT -4

Design of PSC Beams: Design of pre-tensioned and post-tensioned symmetrical and asymmetrical sections by working stress method. Permissible stress, design of prestressing force and eccentricity, limiting zone of pre-stressing force cable profile. Introduction to limit state design. Numerical problems.

REFERENCE BOOKS:

1. T.Y. Lin and Ned H. Burns, Design of prestressed concrete structures John Wiley & Sons, New York.
2. N. Krishna Raju, Prestressed Concrete Tata McGraw Publisher, New Delhi.
3. Pre-stressed Concrete Oxford and IBH Publishing Co., New Delhi.

4. P. Dayarathnam, Fundamentals of prestressed concrete by N.C. Sinha & S.K. Roy, S.Chand and Co. Ltd.
5. IS : 1343 : 1980
6. N. Rajagopalan, Pre-stressed Concrete Alpha Science International Ltd.
7. Kim S. Elliott, Precast Concrete Structures, Butterworth-Heinemann
8. CBRI, Building materials and components, India, 1990

BTCE15F7320	Advanced Design Shallow Foundations	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites;

Basic knowledge of Engineering Mechanics, Strength of Materials and Basic Geotechnical Engineering.

Course Objectives:

1. To understand the different methods of soil exploration methods and dewatering techniques.
2. To understand earth pressures on foundations and retaining structures.
3. To understand to find factor of safety of Earth slope.
4. To understand the different types foundation and their bearing capacity and settlement.

Course Outcomes:

1. Understand Types of shallow foundations.
2. Determine the depth of shallow foundation and its construction.
3. Calculate bearing capacity in field with various experiments.
4. Analyse (bearing capacity and settlement) shallow foundations.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 02	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
BTCE 15F7 320	CO1	3	3	1	3	2	2	1			2			3	3	3	2
	CO2	3	2	1	3		2	1			2			3	3	3	2
	CO3	3	2	3	3		2	1			2			3	3	3	1
	CO4	3	2	3	3		2	1			2			3	3	3	2

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Course Contents:

UNIT I:

General requirements of Foundations – Types of shallow foundations, Modes of shear failure, allowable bearing pressure, Ultimate Bearing capacity of concentrically loaded foundations, Influence of ground water table, Bearing capacity of footings on layered soils, steps involved in proportioning of footings

UNIT II:

Contact pressure under footings – Contact pressure under rigid rectangular footing, strip foundation, rigid circular footing, Principles of footing design, Design of non – rigid combined footings.

UNIT III:

Bearing capacity from SPT, CPT and Field load tests, Building codes, Safety factors in foundation design, Bearing capacity of foundations on slopes, with uplift or tension forces.

UNIT IV:

Settlements for shallow foundations, Designing footings on equal settlements, Reliability of settlement computations, Structures on fills, Allowable bearing pressure for permissible total settlement, approaches based on N values from SPT, Terzaghi – Peck approach for footings on sand, settlement prediction for foundation on mixed soils

TEXT BOOKS:

1.Alam Singh and Chowdhary G.R. **Soil Engineering in Theory and Practice**, CBS Publishers and Distributors Ltd., New Delhi-1994.
2.Punmia B.C. **Soil Mechanics and Foundation Engg,** 16th Edition Laxmi Publications Co. New Delhi2005.
3.Bowles .J.E**, "*Foundation analysis and design*",** McGraw Hill, 2001.
4.Murthy .V.N.S**, "*Textbook of Soil Mechanics and Foundation Engineering*",** CBS Publishers and Distributors, New Delhi, 2009.

REFERENCES BOOKS:

1.Gopal Ranjan and Rao A.S.R. **Basic and Applied Soil Mechanics**, New Age International (P) Ltd., Newe Delhi, 2000.
2.Venkatrahmaiah C.**Geotechnical Engineering**, 3rd Edition New Age International (P) Ltd., Newe Delhi, 2006.
3.Craig R.F. **Soil Mechanics**, Van Nostrand Reinhold Co. Ltd, 1987.
4.Braja M. Das **Principles of Geotechnical Engineering**- (2002), 5th Edition, Thomson Business Information India (P) Ltd., India.
5.Iqbal H. Khan **Text Book of Geotechnical Engineering**- (2005), 2nd Edition, PHI, India

BTCE15F7410	Theory of Elasticity	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites;

Strength of Materials

Course Learning Objectives:

1. To analyze the stress and strain at a point in a loaded elastic material (2D)
2. To analyze 2D dimension problems of elasticity in rectangular coordinates
3. To analyze 2D dimension problems of elasticity in polar coordinates
4. To analyze non-circular sections (solid and thin- walled) subjected to torsion

Course outcomes:

At the end of the course, the student is

1. To analyze the stress and strain at a point in a loaded elastic material (2D)
2. To analyze 2D dimension problems of elasticity in rectangular coordinates
3. To analyze 2D dimension problems of elasticity in polar coordinates
4. To analyze non-circular sections (solid and thin- walled) subjected to torsion

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PS O3	PS O4
BTCE 15F7 410	CO 1					3	2	3	2	2		2	2	3	1	1	3
	CO 2	2				2	2	3	1	1		1	2	3	2	1	3
	CO 3	2		2	1	1	1	3	1	1			2	3	2	1	3
	CO 4	3	1		1	1		3	2	1	1		3	3	2	1	3

Course Contents:

UNIT -1

Introduction to mathematical theory of elasticity: Definition of continuum, stress at a point, strain at a point, Stress-strain relationship, Generalized Hooke's law, St. Venant's principle. Concepts of Plane stress and plane strain, Principal stresses and strains, measurement of surface strains, strain rosettes, Mohr's circle of stress and strain (2D).

UNIT- 2

Two-dimensional problems in Cartesian coordinates: Differential equations of equilibrium, boundary conditions, strain-displacement relations, compatibility equations, Airy's stress function,

Polynomials, bending of a cantilever beam subjected to end load, Simply supported beam subjected to UDL, effect of shear deformation in beam.

UNIT - 3

Two-dimensional problems in polar coordinates: equilibrium equations, strain-displacement relations, compatibility equation, stress-strain relations, axi-symmetric stress distribution, curved beam, thick cylinders. Effect of circular hole on stress distribution in plates subjected to tension, compression and shear, stress concentration factor.

UNIT - 4

Torsion of non-circular sections: Inverse and Semi-inverse methods, stress function, torsion of circular and elliptical sections, Membrane analogy - Torsion of thin walled open and closed sections.

TEXT BOOKS:

1. Timoshenko. S.P. **Theory of Elasticity - International Students** Editon, and Goodier. J.N. - Edition, McGraw Hill Book Co. Inc., New Delhi.
2. Wang. C.T . **Applied Elasticity**- McGraw Hill Book Co. Inc., New Delhi

REFERENCE BOOKS:

1. Valliappan. C, **Contiuum Mechanics Fundamentals**-: Oxford and IBH Publishing Co. Ltd., New Delhi.
2. Srinath.L.S. **Advanced Mechanics of Solids**-: TatMcGraw Hill Publications Co.Ltd., New Delhi.
3. Venkataraman and Patel **Structural Mechanics with Introduction to Elasticity and Plasticity**-: McGraw Hill Book Inc,New York.
4. Arbind Kumar Singh **Mechanics of Solids** : Prentice Hall of India Pvt. Ltd., New Delhi -2007.
5. Sadhu Singh- **Theory of Elasticity** Khanna publishers, New Delhi.

BTCE15F7420	Open channel hydraulics	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Hydraulic & Hydraulic Machines.

Course Objectives:

1. Understand the different types of Flows.
2. Understand the Critical flow depth measurements.
3. Understand the different Flow Profiles.
4. Understand the concept of Hydraulic Jumps.

Course Outcomes:

1. Design of Open channels for uniform flow, critical flow, and gradually varied flow.
2. Analyse and solve practical problems on Critical Flow.

3. Analyse the problems on flow profiles,
4. Explain about concept of rapidly varied flow, of hydraulic jump and its applications as energy dissipater.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 420	CO1	3	3	3	1								3	3	3	3	3
	CO2	3	2	3	2								3	3	3	3	3
	CO3	3	2	3	2								3	3	3	3	3
	CO4	3	2	3	2			1					3	3	3	3	3

Course Contents:

UNIT – 1: INTRODUCTION: Difference between pipe flow and open channel flow, classification of flow, energy equation, momentum equation, kinetic energy and momentum factors.
UNIFORM FLOW: Concepts, uniform flow equations, conveyance and hydraulic exponent for uniform flow, design of channels for uniform flow.
UNIT – 2: CRITICAL FLOW: Concept of specific Energy – Classification of flow. Design of channel, Section Factor, Hydraulic exponent for critical flow critical depth as a flow measurement.
GRADUALLY VARIED FLOW: Concepts, GVF equation, its different forms, Basic assumptions, Dynamic equation, Characteristics of flow profile and classification.
UNIT – 3: Analysis of flows profiles, Method of singular point and transitional depth, Methods of computation, Practical problems.
Gradually Varied Flow Computations: Different methods, direct integration method, Bress's Solution, Chow's solution, direct method, standard step method.
UNIT – 4: Rapidly Varied Flow: Concepts, hydraulic jump in rectangular channels, classification of jumps, characteristics of jump – length location height, application of hydraulic jump stilling basins, shape type-2 and type-4.
Hydraulic jump in rectangular channels, Sloping channels, Jump in non rectangular channels, application of hydraulic jump as energy dissipater.

TEXTBOOKS:

1. Open Channel Hydraulics :Subramanya : Tata McGraw Hill Publishing Co Ltd, New Delhi
2. – Madan Mohan Das, Open Channel Flow Prentice Hall of India Pvt. Ltd., New Delhi 2008 Edition.
3. Rajesh Srivastava, Flow Through Open Channels –Oxford Press, New Delhi 2008 Edition.

REFERENCE BOOKS:

1. Open Channel Hydraulics : French : McGraw Hill Book Company, New Delhi.
2. Modi and Seth : Fluid Mechanics : Standard Book Home, New Delhi.
3. Henderson :Open Channel Hydraulics : Mr. Millan Publishing Co. Ltd., New York.
4. VenTe Chow : Open Channel Hydraulic : McGraw Hill Book Company, New Delhi.

BTCE15F7430	Foundation engineering in difficult ground	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Basic knowledge of Engineering Mechanics, Strength of Materials, Fluid Mechanics and Geotechnical Engineering

Course Objectives:

Ability to analyze the problems associated with designing foundations on difficult ground such as weak and soft soils, expansive and shrinking soils; to understand the design alternatives available to design foundations on difficult soils.

Course Outcomes:

An ability to

1. determining the characteristics of the ground, remedial measures
2. Design alternatives in expansive soil
3. design Stability of slopes in difficult ground
4. Design for highway and air- field pavements

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
BTCE 15F7 430	CO1	3	3	3	1								3	3	3	3	3
	CO2	3	2	3	2								3	3	3	3	3
	CO3	3	2	3	2								3	3	3	3	3
	CO4	3	2	3	2			1					3	3	3	3	3

Course Contents:

UNIT I: Introduction: Classification, swelling and shrinkage, sensitivity, settlement and bearing capacity of clays, fissures in clay, glacial deposits, and difficult rocks Site investigation in difficult ground: Objectives, difficulties in determining the characteristics of the ground, remedial measures
12 hours

UNIT II: Design alternatives in expansive soil: Introduction, drilled pier and beam foundation, mat foundation, under-reamed pile foundation, general conditions for under reamed piles, design and construction.Treatment of expansive soils: Introduction, removal and replacement, remolding and compaction, pre-loading, pre-wetting, stabilization-lime, cement, fly ash, application methods, moisture control, electro chemical treatments
12 hours

UNIT III: Foundations and earth movements: Introduction, creep of rock masses, landslides, earthquake-primary and secondary effects, earthquake resistant design Stability of slopes in difficult ground: Introduction, mechanism of stability, strength of distorted clay, factor of safety, analysis, remedial measures.
12 hours

UNIT IV: Design for highway and air- field pavements: Introduction, general principles of pavement design, design features and treatment methods for expansive soil subgrades, air-field procedures.
12 hours

TEXT BOOKS

1. F.G.Bell, Foundation in difficult ground, Butterworths & Co.
2. F.H. Chen, Foundations on expansive soil, Elsevier Science Publishing Company,NY.
3. E.A. Sorochan, Construction of buildings on expansive soils, Oxford & IBH Publications

REFERENCE BOOKS

1. Expansive soils- Problems and Practice in foundation and pavement Engineering- John.D. Nelson and Debora J. Miller, John Wiley & Sons.

BTCE15F7440	Solid & hazardous waste management	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Industrial Waste Management and Environmental Engineering.

Course Objectives:

1. To develop insight into the collection, transfer, and transport of municipal solid waste.
2. Different methods of municipal solid waste disposal are studied.
3. Examine the operation of a resource recovery facility and understanding the different methods of waste to energy facility.
4. To understand the different types of biological and hazardous waste disposal.

Course Outcomes:

1. Explain the different methods of collection, transfer, and transport of municipal solid waste.
2. Explain the Different methods of municipal solid waste disposal.
3. Exposure to different method of waste to energy facility.
4. Evaluate landfill site and to study the sanitary landfill reactions.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 440	CO1	3	3	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO2	3	2	2	3	3	-	3	-	-	-	-	3	3	3	3	3
	CO3	1	3	2	2	3	-	3	-	-	-	-	3	3	3	3	3
	CO4	1	3	2	2	2	-	2	-	-	-	-	3	3	3	3	3

Course Contents:

Unit 1: Introduction

Composition and Handling of Solid Wastes: Sources and Types of solid wastes, Characteristics of solid waste, Waste generation and handling at source, Problems due to improper disposal of solid waste. Scope and importance of solid waste management

Unit 2: Collection, Transportation, Treatment/Processing

Systemsofcollection, collection equipment,garbagechutes,transferstations–bailingand compacting,routeoptimizationtechniquesandproblems.

Componentsseparation,volume reduction, size reduction, chemical reduction, plastic waste-environmental significance and reuse, reuse of materials in other industries.

Unit 3: Disposal Methods

Opendumping, ocean disposal, feedingtohogs,incineration- Process–3T's,factorsaffectingincinerationprocess, incinerators–types,preventionofairpollution,Pyrolysis, energy recovery operations, composting- Aerobic and anaerobic composting, factors affecting composting, Indore and Bangalore processes, mechanical and semi mechanicalcompostingprocesses.Vermi-composting, Sanitary landfill-Differenttypes,trencharea,Rampandpit method,siteselection,basicstepsinvolved,celldesign,preventionofsite pollution,leachate&gascollectionandcontrolmethods,geo-syntheticfabrics insanitarylandfills.

Unit 4: Hazardous Waste

Classification, Generation, Toxicology, Bio-medical wastes, Treatment of HW-physico-chemical processes, stabilization and solidification, thermal methods, secured landfills in disposal of Hazardous waste, Remedial technologies.

REFERENCE BOOKS:

1. GeorgeTchobanoglous, Hilary Theisen, Samuel A Vigil, "Integrated Solid Waste Management: Engineering principles and management issues", M/c Graw hill Education. Indian edition
2. Bhideand Sunderashan Solid Waste Management in developing countries.
3. PavoniJ.L. Handbook on Solid Waste Disposal.
4. Howard S Peavy, Donald R Rowe and George Tchobanoglous, "Environmental Engineering", Tata Mcgraw Hill Publishing Co ltd.,
5. S.K.Garg, Environmental Engineering–Vol. II.
6. Bio medical waste handling rules– 2000.
7. Vesilind.PaWorrell&Reinhart.D;Solid Waste Engineering; Cengage Learning India Private Limited, New Delhi.(2009)

BTCE15F7450	Road safety and management	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Transportation Engg-I and Transportation ENgg-II

Course Objectives:

1. To understand the design aspects of road geometrics to address the practical problems in highway engineering.
2. To get the knowledge of selecting appropriate cross sectional elements of roads.
3. To understand the analysis of horizontal alignment& vertical alignment of roads.
4. To understand the design various types of intersections of roads.

Course Outcomes:

1. Select appropriate cross sectional elements of roads.
2. Analyse the horizontal alignment of roads.
3. Analyse the vertical alignment of roads.
4. Design various types of intersections of roads.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4

BTCE 15F7 450	**CO1**	**3**	**3**	**3**	**2**						**1**		**1**	**3**	**2**	**3**	**2**
	CO2	**3**	**3**	**3**	**2**			**2**		**3**	**3**			**3**	**3**	**3**	**2**
	CO3	**3**	**3**	**2**	**2**		**1**			**2**	**1**			**3**	**3**	**3**	**2**
	CO4	**3**	**3**			**2**					**2**	**3**	**2**	**3**	**3**		**1**

UNIT – 1 [Lecture Hours: 12]

Road accidents: Collection and Analysis of Accident Data, Condition and Collision Diagram, Causes and Remedies-influence of roadway and traffic conditions on traffic safety; accident coefficients; Analysis of individual accidents to arrive at real causes; Methods of representing accident rate-Statistical Methods in Traffic Safety Analysis – Regression Methods, Poisson distribution, Chi-Squared Distribution, Statistical Comparisons- Numerical Examples

UNIT – 2 [Lecture Hours: 12]

Road safety issues and various measures for road safety- Engineering, education and enforcement measures for improving road safety-Short term and long term measures-Road safety education and training- Reconstruction and Rehabilitation of Roads, Road Maintenance- Traffic calming techniques and innovative ideas in road safety.

.**UNIT – 3 [Lecture Hours: 12]**

Economic evaluation of improvement measures by "before and after studies" Counter measures at hazardous locations – accident investigation, problem diagnosis, development of counter measures, checklists for counter measures- Operating the road network for safety, highway operation and counter-measures, road safety audit, principles- procedures and practice, code of good practice and checklists.

UNIT – 4 [Lecture Hours: 12]

Traffic management techniques- Local area management-Transportation system management-Low cost measures, area traffic control. Various types of medium and long term traffic management measures and their uses. Evaluation of the effectiveness and benefits of different traffic management measures, management and safety practices during road works. Case studies -Road Safety Improvement Strategies, ITS and Safety

REFERENCE BOOKS:

1. BABKOV, V.F. `Road conditions and Traffic Safety', MIR publications, - 1975.
2. K.W. Ogden, `Safer Roads – A Guide to Road Safety Engg.' Averbury Technical, Ashgate Publishing Ltd., Aldershot, England, 1996.

3. Kadiyali, L.R., `Traffic Engineering and Transport Planning', Khanna Publications.
4. RL, DSIR, `Research on Road Safety', HMSO, London.
5. Papacoastas 'Introduction to Transportation Engineering' –Prentice
6. Transportation Engineering – An Introduction, C.Jotin khisty, B. Kent Lall

BTCE15F7510	Design of bridges & water tanks	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Hydrology and Irrigation Engineering, Design of RCC Structural Elements

Course Objectives:

1. To learn about the various types and components of bridges, IRC standards
2. To perform hydraulic design and structural design of substructures and foundations
3. To design RC T beam bridgeand composite bridge **s**uperstructure
4. To learn about the provisions of IS: 3370
5. To design and detail circular and rectangular water tanks by working stress and limit state methods
6. To design and detail circular overhead water tanks including staging

Course Outcomes:

At the end of the course, the student

1. Has learnt about the various types and components of bridges, IRC standards
2. Is able to perform hydraulic design and structural design of substructures and foundations
3. Is able to design RC T beam bridgeand composite bridge **s**uperstructure, Has learnt about the provisions of IS: 3370
4. Is able to design and detail circular and rectangular water tanks by working stress and limit state methods, Is able to design and detail circular overhead water tanks including staging

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O2	PS O3	PS O4
BTCE 15F7 510	CO1	1	1	1		1		2	1	2				3	3	2	3
	CO2	1	2	3		1			1	2				3	3	3	2
	CO3	3	3	3	1	1		1		1				3	3	3	1
	CO4	3	2	3	1	1		1		1				3	3	3	2

Course Contents:

UNIT – 1: BRIDGE PRELIMINARIES: Classification of bridges and standard loads, Bridge-definition, components of bridges, various classification, types of bridges, forces to be considered for the design, IRC standards.

HYDRAULIC DESIGN: Methods of finding design discharge, natural, artificial and linear water ways, afflux, economic span.

SUBSTRUCTURES AND FOUNDATIONS: Types of abutments, piers and wing walls, forces to be considered for the design, Types of foundations and forces to be considered for the design, depth of scour.

UNIT – 2: DESIGN OF T-BEAM R C BRIDGE with cross beams by Piegaud's and Courbon's method for class-AA loading, empirical design of substructures and foundations.

DESIGN OF COMPOSITE BRIDGE: Design of composite bridge for EUDL, Shear connectors-design requirements for shear connectors.

UNIT – 3: IS: 3370 Codal Provisions, Design and detailing of Circular and Rectangular water tanks resting on ground (Flexible base and Rigid base) and underground by working stress and limit state methods.

UNIT – 4: Design and detailing of Circular overhead water tanks including staging.

TEXT BOOKS:

1. Johnson Victor, Essentials of Bridge Engineering: Oxford IBH Publications, New Delhi.
2. Design of Bridges: Krishna Raju N, Oxford IBH Publications, New Delhi.
3. Jagadish T. R. & Jayaram M. A., Design of Bridge Structures Prentice Hall of India, New Delhi.
4. N. Krishnaraju, Structural Design & Drawing Reinforced Concrete & Steel- University Press.
5. B.C. Punmia – Reinforced Concrete Structures - Laxmi Publishing Co., New Delhi.
6. S.N.Sinha, Reinforced Concrete Design –McGraw Hill Education, Delhi.

BTCE15F7520	Matrix Methods Of Structural Analysis	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Intermediate Structural Analysis

Course Objective:

1. To determine degrees of static and kinematic indeterminacies of framed structures.
2. To determine element flexibility and stiffness matrices, force and displacement transformation matrices and construct structure flexibility and stiffness matrices.
3. To analyze the plane framed structures by the flexibility matrix and stiffness matrix methods (element approach)
4. To analyze the plane framed structures by the direct stiffness method

Course outcomes:

At the end of the course the student is able

1. To determine degrees of static and kinematic indeterminacies of framed structures.
2. To determine element flexibility and stiffness matrices, force and displacement transformation matrices and construct structure flexibility and stiffness matrices.

3. To analyze the plane framed structures by the flexibility matrix and stiffness matrix methods (element approach)
4. To analyze the plane framed structures by the direct stiffness method

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 520	CO1	3	3	1		2	2	1					2	3	3		2
	CO2	3	3	1										3	3		
	CO3	3	3	1		3	2						2	3	3		3
	CO4	3	3	1		3	2						2	3	3		3

Course Contents:

UNIT – 1:Introduction to flexibility method: Degree of static indeterminacy, Element flexibility matrix, Principle of contragradience, Force Transformation Matrix, Construction of structure flexibility matrix, Determination of the displacement vector, Determination of member forces.

UNIT – 2: Analysis of axially rigid continuous beams, rigid plane frames, trusses by flexibility method using Force Transformation Matrix

UNIT – 3: Introduction to stiffness method: Degree of kinematic indeterminacy, Equivalent joint loads, Displacement Transformation matrix. Member stiffness matrix, Total or System stiffness matrix.

Analysis of axially rigid continuous beams, rigid frames and trusses by stiffness method using Displacement Transformation Matrix**.**

UNIT – 4: Introduction to direct stiffness method: Local and global co-ordinate system, Transformation of variables, Transformation of member displacement matrix, Transformation of member force matrix, Transformation of member stiffness matrix, Transformation of stiffness matrix of the member of a truss, Transformation of stiffness matrix of the member of a rigid frame, Overall stiffness matrix, Boundary conditions, Computation of internal forces.

Analysis of trusses, axially rigid continuous beams and rigid-jointed plane frames by direct stiffness method.

REFERENCE BOOKS:

1. Devdas Menon, Advanced Structural Analysis.
2. W. Weaver J.M. Gere, Matrix Analysis of framed structures CBS Publishers and Distributors, 1986
3. H C Martin, Introduction to Matrix Methods of Structural analysis International text book Company, 1996
4. S Rajshekharan. G Sankara Subramanian, Computational structural Mechanics PHI, 2001
5. G.S Pandit & S P Gupta, Structural Analysis A Matrix Approach Tata Mc Graw-Hill, 1981.
6. C.S Reddy, Basic structural Analysis Tata McGraw-Hill, 1996.
7. L S Negi and R S Jangid, Structural Analysis Tata McGraw-Hill, 1997.
8. M Mukhopadhyay,Matrix, finite elements, Computer and Structural analysis Oxford & IBW, 1984.

BTCE15F7530	Reinforced earth structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Basic knowledge of Engineering Mechanics, Strength of Materials, and Geotechnical Engineering

Course Objectives

1. To create an understanding of the latest technique such as reinforcing the soil;
2. To analyze the concept of RE so as to ascertain stability of RE structures;
3. To understand the different reinforcing materials that can be used efficiently in soils.

Course Outcomes:

An ability to

1. Understand basics of reinforced earth construction geosynthetics and their functions properties and tests on materials
2. Understand Concept of Reinforced earth retaining wall.
3. Determination of force induced in reinforcement ties
4. Applications to Temporary and Permanent roads

6. Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
	CO1	3	3	1		2	2	1					2	3	3		2

BTCE 15F7 530	**CO2**	**3**	**3**	**1**									**3**	**3**		
	CO3	**3**	**3**	**1**		**3**	**2**					**2**	**3**	**3**		**3**
	CO4	**3**	**3**	**1**		**3**	**2**					**2**	**3**	**3**		**3**

UNIT- 1:BASICS OF REINFORCED EARTH CONSTRUCTION: Definition, Historical Background, Components, Mechanism and Concept, Advantages and Disadvantage of reinforced earth Construction, Sandwich technique for clayey soil.**GEOSYNTHETICS AND THEIR FUNCTIONS** Historical developments, Recent developments, manufacturing process woven &non-woven, Raw materials –Classification based on materials type – Metallic and Non-metallic, Natural and Man-made, Geosynthetics – **PROPERTIES AND TESTS ON MATERIALS** Properties – Physical, Chemical, Mechanical, Hydraulic, Endurance and Degradation requirements, Testing & Evaluation of properties **12 hours**

UNIT II: DESIGN OF REINFORCED EARTH RETAINING WALLS Concept of Reinforced earth retaining wall, Internal and external stability, Selection of materials, typical design problems

SOIL NAILING TECHNIQUES

Concept, Advantages & limitations of soil nailing techniques, comparison of soil nailing with reinforced soil, methods of soil nailing, Construction sequence, Components of system, Design aspects and precautions to be taken. **12 hours**

UNIT III: DESIGN OF REINFORCED EARTH FOUNDATIONS AND EMBANKMENTS - Modes of failure of foundation, Determination of force induced in reinforcement ties – Location of failure surface, tension failure and pull out resistance, length of tie and its curtailment, Bearing capacity improvement in soft soils, General guidelines. **Embankments** - Concept of Reinforced Embankments, Internal and external stability, Selection of materials, typical design problems **12 hours**

UNIT IV :GEOSYNTHETICS FOR ROADS,SLOPES AND LAND FILLS Roads - Applications to Temporary and Permanent roads, Role of Geosynthetic in enhancing properties of road, control of mud pumping, Enhancing properties of subgrade, Design requirements Slopes – Causes for slope failure, Improvement of slope stability with Geosynthetic, Drainage requirements, Construction technique.Geosynthetics - Filter, Drain and Landfills-introductory concepts **12 hours**

TEXT BOOKS:

1. Koerner. R.M. - Design with geosynthetics- Prince HallPublication, 2005
2. Koerner. R.M. & Wesh, J.P.- Construction and Geotechnical Engineering using synthetic fabrics- Wiley Inter Science, NewYork, 1980.
3. Sivakumar Babu G. L.,An introduction to Soil Reinforcement and Geosynthetics –Universities Press, Hyderabad, 2006
4. Swami Saran,I. K. Reinforced Soil and its Engineering Applications, International Pvt. Ltd, New Delhi, 2006
5. Venkattappa Rao. G., &Suryanarayana Raju., G. V.S.Engineering with Geosynthetics- - Tata Mc Graw Hill publishing Company Limited., New Delhi.

REFERENCE BOOKS:

1. Jones, Earth reinforcement and Soil structure- CJEPButterworths, London, 1996.
2. Ingold, T.S. & Millar, K.S. - Geotextile Hand Book- Thomas, Telford, London.
3. Shigenori Hayshi & Jen Otani -Earth Reinforcement Practices - Hidetoshi Octial, Vol. I, A.A. Balkema, Rotterdam, 1992.
4. Bell F.G. - Ground Engineer's reference Book- Butterworths, London, 1987.
5. T.S. - Thomas, Reinforced Earth- Ingold, Telford, London.

BTCE15F7540	Payment management system	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

NONE

Course Objectives:

1. To educate students about the importance of pavement evaluation, different methods of evaluating pavements, factors affecting deterioration and measures to reduce them, methods of evaluating surface condition
2. To make students familiar with concept of predicting pavement performance and deterioration modelling, different models for pavement modelling, HDM software and its use for pavement management.
3. To make students appreciate the design objectives, constraints, alternate pavement design strategies and economic evaluation, importance of economic analysis, life cycle costing.
4. To give students an overview of techniques and tools for pavement preservation, role of computers in pavement management, expert systems.

Course Outcomes:

On successful completion of this course, students should be able to:

1. Explain: the structural and functional requirements of pavements, methods of evaluation pavements, effects of pavement deterioration and remedial measures, methods of evaluation.
2. Describe: modeling techniques for pavement performance prediction, use of HDM software for pavement management, comparison of different models
3. Discuss: design objectives, constraints, compare various pavement design strategies, economic evaluation of pavements and life cycle costing methods
4. Enumerate: tools and techniques of road asset management, expert systems in managing pavements, role of computers of pavement management.
5. **Mapping of Course Outcomes with programme Outcomes**

UNIT – 1 [Lecture Hours: 12]

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 540	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	2	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	2	-	2	-	2	-	-	3	3	3	3	3
	CO4	3	3	1	2	2	-	2	-	2	-	-	3	3	3	3	3

Evaluation: Structural and functional requirements of flexible and rigid pavements, various aspects of surface and their importance, causes, factors affecting deterioration and measures to reduce – pavement slipperiness, unevenness, ruts, potholes and cracks. Evaluation of surface condition by MERLIN and 5TH wheel bump integrator methods

UNIT – 2 [Lecture Hours: 12]

Introduction to pavement management system – components, planning and research management, pavement performance prediction – concepts, modeling techniques, structural and functional condition deterioration models, mechanistic and empirical models, HDM and other models, comparison of different deterioration models

UNIT – 3 [Lecture Hours: 12]

Design alternatives and selection – design objectives, constraints, basic structural response models, physical design inputs, alternate pavement design strategies and economic evaluation, reliability concepts in pavement engineering, life cycle costing, and analysis of alternate pavement strategies based on distress and performance

UNIT – 4 [Lecture Hours: 12]

Road asset management – pavement preservation programme, techniques and tools, role of computers in pavement management, applications of expert systems for managing pavements, evaluation and rehabilitation.

REFERENCE BOOKS:

1. Ralph Haas and Ronald W. Hudson, 'Pavement Management System', McGraw hill book co. 1978
2. Ralph Haas, Ronald Hudson and Zanieswki, 'Modern Pavement Management', Kreiger publications

3. Proceedings of the international conference on managing pavements
4. NCHRP, TRR, FHWA and TRB special reports

BTCE15F7550	Environmental impact assessment	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Knowledge in Water Supply Engineering and Waste Water Treatment, Solid and Hazardous Waste Management, Air and Noise Pollution control, Industrial Waste Water Treatment

Course Objectives:

1. To provides instruction in the theory and methods of environmental impact assessment (EIA).
2. To Gain a critical understanding of the use, strengths, and limitations of EIA, and develop working familiarity with EIA methods and analytic techniques.
3. To use for professional planning for different ways which includes evaluation of proposed public and private development projects, government policies and programs.

Course Outcomes:

1. Strengthen understanding of the impacts related to developing projects on Environment, culture and socio-economic environment.
2. Understanding the methodology for preparation of a systematic EIA report.
3. Learn to discuss adaptive management and monitoring as follow up activities.
4. Through case studies, students get exposed to a variety of different resettlements, scenarios, challenges and solutions.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO1	P02	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
BTCE15F7550	CO1	3	3	2	3	3	-	-	-	2	-	-	3	3	3	3	3
	CO2	3	3	2	3	2	-	-	-	2	-	-	3	3	3	3	3
	CO3	3	3	2	1	2	-	2	-	2	-	-	3	3	3	3	3
	CO4	3	3	1	2	2	-	2	-	2	-	-	3	3	3	3	3

Unit 1: INTRODUCTION

Environmental Impact Assessment (EIA), Historical development of Environmental Impact Assessment - Environmental Impact Statement (EIS) - Environmental Risk Assessment (ERA) - Legal and Regulatory aspects in India - Types and limitations of EIA - Terms of Reference in EIA- Issues in EIA - national - cross sectoral - social and cultural.

Unit 2: COMPONENTS AND METHODS & QUALITY CONTROL

Components - screening - setting - analysis - prediction of impacts - mitigation. Matrices - Networks - Checklists. Importance assessment techniques - cost benefit analysis - analysis of alternatives - methods for Prediction and assessment of impacts - air - water - soil - noise - biological - cultural - social - economic environments.

Standards and guidelines for evaluation, Public Participation in environmental decision making, Trends in EIA practice and evaluation criteria - capacity building for quality assurance.

Unit 3: DOCUMENTATION AND MONITORING

Expert System in EIA - use of regulations and AQM. Document planning - collection and organization of relevant information - use of visual display materials – team writing - reminder checklists. Environmental monitoring - guidelines - policies - planning of monitoring programmes. Environmental Management Plan, Post project audit.

Unit 4: CASE STUDIES

Case studies of EIA of developmental projects- EIA for Water resource developmental projects, Highway projects: Nuclear-Powerplantprojects,Miningproject(Coal,Ironore),ThermalPowerPlant, InfrastructureConstructionActivities.

Course Outcome:

1. Strengthen understanding of the impacts related to developing projects on Environment, culture and socio-economic environment.
2. Understanding the methodology for preparation of a systematic EIA report.
3. Learn to discuss adaptive management and monitoring as follow up activities.
4. Through case studies, students get exposed to a variety of different resettlements, scenarios, challenges and solutions.

References:

1. Canter, L.W., " Environmental Impact Assessment ", McGraw Hill, New York, 1996.
2. Petts, J., " Handbook of Environmental Impact Assessment Vol. I and II ", Blackwell Science, London, 1999.
3. The World Bank Group., " Environmental Assessment Sourcebook Vol. I, II and III ", The World Bank.
4. Guidelines for EIA of developmental Projects Ministry ofEnvironmentandForests,GOI.

BTCE15F7800	Concrete & Highway Material Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Preequisites:

Construction materials, Concrete technology theory**.**

Course Objectives:

1. To understand the characteristics and behaviour of civil engineering materials used in buildings and infrastructure.
2. Students will learn standard principles and procedure to design prepare and/or test materials such as concrete mix design including field test methods for fresh concrete.
3. Students will know how to select materials based on their properties and their proper use for a particular facility under prevailing loads and environmental conditions.
4. Students will have exposure to practical applications including writing of a technical report related to each experiment.

Course Outcomes:

1. Demonstrate ability to make selection of materials based on their properties, behaviour and intended use in design and construction.
2. Write formal technical report & convey Engineering message efficiently.
3. Understand ethical issues associated with Engineering experiments and professional practice.
4. Collaborate lab work in groups and divide responsibilities among group members.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 800	CO1	1	2	3				2	1	1				3	3	2	3
	CO2	1	2	3					1					3	3	3	2
	CO3	3	2	3										3	3	3	1
	CO4	3	2	-	2			1						3	3	3	2

LIST OF EXPERIMENTS:

1. Tests on cement: Normal Consistency, Setting time, Specific gravity of cement, Soundness by Autoclave method, Air permeability test for fineness
2. Tests on Aggregates:Crushing, abrasion, impact and Shape tests (Flaky, Elongation, Angularity number)
3. Tests on fresh concrete: Workability by Slump, Compaction factor and, VeeBee tests.
4. Tests on Hardened concrete: Compression strength ,Split tensile tests, Test on flexural strength of RCC beams, Permeability
5. California Bearing Ratio Test
6. Aggregate Impact Test, Los Angeles Abrasion Test , Aggregate Crushing Test
7. Aggregate Shape Tests, Aggregate Specific Gravity and Water Absorption Test
8. Bitumen Specific Gravity Test, Penetration Test , Softening point Test
9. Ductility Test, Elastic Recovery Test, Viscosity Test, Flash and Fire Point Test
10. Stripping Test, Rothfutch's Aggregate Proportioning Method
11. Marshall Method of Mix Design

REFERENCES BOOKS:

1."Laboratory Manual on Concrete Technology" Sood, Hemant, Mittal L N and Kulkarni P D, CBS Publishers, New Delhi, 2002.

2. Gambhir M L "Concrete Manual Laboratory testing for quality control" of concrete 4th edition DhanpatRai and Sons Delhi 1992.

3. Mehta P.K, "Properties of Concrete", Tata McGraw Hill Publications, New Delhi.

4. Neville AM, "Properties of Concrete", ELBS Publications, London.

5. Relevant BIS codes.

6. S K Khanna, C E G Justo and A Veeraragavan, "Highway Materials Testing Laboratory Manual ", Nem

Chand Bros, Roorkee

7. L R Kadiyali, "Highway Engineering ", Khanna Publishers, New Delhi

BTCE15F7900	Environmental Engineering Lab	L	T	P	C	Hrs/Wk
Duration :16 Wks		1	0	1	2	3

Prerequisites:

Theoretical Concept of Environmental Engineering

Course Objectives:

1. To estimate different parameters of the water quality
2. To Study and analysis the quality requirements for domestic waters.
3. To make the students as to suggest required type of treatment to purify raw water
4. To identify the ill effects of environmental pollution

Course Outcomes:

1. Analyse various physico-chemical and biological parameters of water quality
2. Assess complete water quality assessment for domestic supplies
3. Recommend the various types of treatment methods required to purify raw water.
4. Implement new environmental techniques to avoid pollutants

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F7 900	CO1	**3**	**3**	**3**	**3**	**3**							**3**	**3**	**3**	**3**	**3**
	Co2	**3**	**3**	**3**	**3**	**3**							**3**	**3**	**3**	**3**	**3**
	Co3	**3**	**3**	**3**	**3**	**3**		**3**					**3**	**3**	**3**	**3**	**3**
	CO4	**3**	**3**	**3**	**3**	**3**		**3**					**3**	**3**	**3**	**3**	**3**

LABORATORY EXPERIMENTS

1. Determination of Alkalinity, Acidity, pH
2. Jar test for optimum dosage of alum
3. Determination of fluoride
4. Determination of chlorides
5. Determination of residual chlorine
6. Determination of percentage of available chlorine in bleaching powder
7. Determination of electrical conductivity and turbidity
8. Determination of DO and Biochemical Oxygen Demand (BOD) of Wastewater
9. Determination of Total solids, suspended solids, dissolved solids, volatile solids, fixed solids and settleable solids.
10. Determination of sulphates
11. Determination of iron by phenanthroline method.
12. MPN determination
13. Determination of nitrates
14. Determination of heavy metals-Lead, Cadmium and Zinc

REFERENCE BOOKS:

1. Manual of Water and Wastewater Analysis – NEERI Publication.

2. Standard Methods for Examination of Water and Wastewater (1995), American Publication – Association, Water Pollution Control Federation, American Water Works Association, Washington DC.
3. IS Standards: 2490-1974, 3360-1974, 3307-1974.
4. Chemistry for Environmental Engineering, Sayer and Mccarthy
5. Environmental Engineering Laboratory Manual- Dr.BKotaiah, N Kumara Swamy

SYLLABUS VIII SEMESTER

BTCE15F8100	Seminar	L	T	P	C	Hrs/Wk
Duration :16 Wks		0	0	2	2	4

BTCE15F8200	Project Work	L	T	P	C	Hrs/Wk
Duration :16 Wks		0	1	5	6	5

Description of the course:

Project with seminar consists of several aspects of civil engineering courses studied by taking up topic of interest related to field of civil engineering. The student with the concepts of differenct courses and carrying out the literature review, will complete the Project work with submission of report and presentation of the project work taken up in civil engineering.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS / COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3	PSO4
BTCE15F8100 / BTCE15F8200	CO	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

BTCE15F8310	Finite Element Analysis	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Theory of Elasticity

Course Learning Objectives:

1. To learn about energy concepts and theorems, Rayleigh - Ritz Method and Galerkin's Method
2. To learn about basic concepts, principles, advantages and disadvantages of FEM
3. To derive element properties
4. To analyze 2D problems of framed structures and continuum
5. To learn about formulation of isoparametric elements
6. To learn about the modules of a standard FEM computer program

Course Outcomes:

At the end of the course, the student

1. Has learnt about energy concepts and theorems, Rayleigh - Ritz Method and Galerkin's Method
2. Has learnt about basic concepts, principles, advantages and disadvantages of FEM
3. Is able to derive element properties, Is able to analyze 2D problems of framed structures and continuum
4. Has learnt about formulation of isoparametric elements, Has learnt about the modules of a standard FEM computer program

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F8 310	3	3											3	3			3
	3	3	1										3	3			3
	3	3	2			1					1		3	3		1	3
	2	2	1	2	3	2	1	2	1	1		2	3	3	3	2	2

Course Contents:

UNIT – 1:Introduction: Basic Concepts, Review of Theory of Elasticity, Matrix displacement formulation, Energy concepts, Principles of minimum potential energy and minimum complementary energy.

Rayleigh - Ritz Method, Galerkin's Method, Simple numerical problems.

UNIT – 2: Displacement models, natural coordinates, construction of shape functions for 2 D truss, beam and rigid frame elements, Lagrangian and Hermitian interpolation, assembly of stiffness matrices and load vectors by direct stiffness method, boundary conditions,
Applications of FEM for the analysis of plane truss, continuous beam and simple plane frame problems.
UNIT – 3: Analysis of 2D Continuum Problems: Plane stress and Plane strain**,** Polynomial displacement functions, Triangular, rectangular and quadrilateral elements, Shape functions, Pascal triangle, convergence requirements of shape functions, Simple numerical problems.
UNIT – 4: Theory of Isoparametric Elements: Isoparametric, subparametric and super-parametric elements, formulation of isoparametric quadrilateral element.
FEM Program: Structure of computer program for FEM analysis, description of different modules, pre and post processing.

REFERENCE BOOKS:

1. C.S. Krishnamoorthy, Finite Element Analysis – Theory and Programming, Tata McGraw Hill Co. Ltd., New Delhi.
2. Chadrupatla, Tirupathi R.Finite Element Analysis for Engineering and Technology- University Press, India.
3. J.F. Abel and Desai. C.S., Introduction to the Finite Element Method Affiliated East West Press Pvt. Ltd., New Delhi.
4. Rajasekharan. S, Finite Element Analysis in Engineering Design- Wheeler Pulishers.
5. Daryl L Logan, A First Course on Finite Element Method –Cengage Learning
6. Zienkeiwicz. O.C., the Finite Element Method Tata McGraw Hill Co. Ltd., New Delhi.
7. S.S. Bhavikatti, Finite Element Analysis New Age International Publishers, New Delhi.
8. R.D.Cook, et al., Concepts and applications of finite element analysis John Wiley & Sons, New York.

BTCE15F8320	**Ground Improvement Techniques**	**L**	**T**	**P**	**C**	**Hrs/Wk**
Duration :16 Wks		**3**	**1**	**0**	**4**	**5**

Prerequisites:

Basic knowledge Basics of Geotechnical Engineering

Course Objectives:

1. To create an ability to apply to analyse and interpret data related to improvement in strength and compressibility characteristics of weak soils;
2. To accentuate the understanding of the basic principles involved in various techniques of ground improvement.
3. To accentuate the understanding of the Stabilization concept of ground improvement.
4. To create an ability to apply the grouting process in different locations.

Course Outcomes:

1. At the end of this course the student is expected to learn various techniques of insitu ground modification.
2. At the end of this course the student is expected to learn various techniques of insitu ground compaction and variation of soil properties in ground.
3. At the end of this course the student is expected to learn various stabilization process and about chemical stabilization.
4. At the end of this course the student is expected to learn various methods of soil reinforcement and about grouting method.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F8 320	CO1	2				2		3				2		3	2	1	2
	CO2	2	2	1		2		2						3	2	1	2
	CO3	2				3		2						3	3	3	1
	CO4	2				3		1						3	3	3	2

UNIT I: GROUND IMPROVEMENT: Definition, Objectives of ground improvement, Classification of ground improvement techniques, Factors to be considered in the selection of the best soil improvement technique. Ground modification for Black Cotton soil **DRAINAGE AND DEWATERING:** Determination of ground water level by Hvorselev's method, Control of ground water during excavation: Dewatering - Ditches and sumps, well point system, Vacuum method, Electro- Osmosis method. **DRAINAGE & PRELOADING:** Importance, Vertical drains, Sand drains, Drainage of slopes, Electro kinetic dewatering, Preloading.

12 hours

UNIT II: COMPACTION: Effect of grain size distribution on compaction for various soil types like lateritic soil, coarse-grained soil and micaceous soil. Effect of compaction on engineering behaviour like compressibility, swelling and shrinkage, permeability, relative density, liquefaction potential. Field compaction – static, dynamic, impact and vibratory type. Specification of compaction. Tolerance of compaction. Shallow and deep compaction, Dynamic Compaction, Vibrofloatation.

12 hours

UNIT III: CHEMICAL MODIFICATION-I: Definition, cement stabilization, sandwich technique, admixtures. Hydration – effect of cement stabilization on permeability, Swelling and shrinkage and strength and

deformation characteristics. Criteria for cement stabilization. Stabilization using Fly ash.**CHEMICAL MODIFICATION-II:** Lime stabilization – suitability, process, criteria for lime stabilization. Other

chemicals like chlorides, hydroxides, lignin and hydrofluoric acid. Properties of chemical components, reactions and effects. Bitumen, tar or asphalt in stabilization.

12 hours

UNIT IV: GROUTING: Introduction, Effect of grouting. Chemicals and materials used. Types of grouting. Grouting procedure, Applications of grouting.**MISCELLANEOUS METHODS (ONLY CONCEPTS & USES):** Soil reinforcement, Thermal methods, Ground improvement by confinement – Crib walls, Gabions and Mattresses, Anchors, Rock bolts and soil nailing. Stone Column, Micropiles.

12 hours

TEXT BOOKS:

1. Purushothama Raj P. Ground Improvement Techniques- Laxmi Publications, New Delhi1999.
2. Koerner R.M. Construction and Geotechnical Method in Foundation Engineering - Mc Graw Hill Pub. Co., New York-1985.

REFERENCE BOOKS:

1. Manfred Hausmann Engineering principles of ground modification - Mc Graw Hill Pub. Co., New York-1990.
2. Bell, F.G. Methods of treatment of unstable ground- Butterworths, London 1975.
3. Nelson J.D. and Miller D.J.Expansive soils- John Wiley and Sons 1975.
4. Ingles. C.G. and Metcalf J.B.Soil Stabilization; Principles and Practice- - Butterworths, London 1972.

BTCE15F8330	Industrial Waste Water Treatment	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Water supply and Sanitation Engineering, Hydraulic machines

Course Objectives:

1. To explain various tertiary treatment unit operations.
2. To explain combined treatment feasibility.
3. To understand the treatment of selected industrial waste.

Course Outcomes:

1. Assess the effect of industrial waste on stream.
2. Make use of tertiary treatment unit operations.
3. Make a choice of combined treatment of domestic and industrial waste.
4. Propose a treatment plant for few selected industrial processes.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F8 330	CO1	3	3	2	3	3							3	3	3	3	3
	CO2	3	3	2	3	2							3	3	3	3	3
	CO3	3	3	2	1	2		2					3	3	3	3	3
	CO4	3	3	1	2	2		2					3	3	3	3	3

Course Contents:

UNIT - I

INTRODUCTION: Difference between Domestic and Industrial Wastewater, Effect on Streams and on Municipal Sewage Treatment Plants. Stream Sampling, Effluent and Stream Standards and Legislation to Control Water Pollution. Stream Quality, Dissolved oxygen Sag Curve in Stream, Streeter– Phelps formulation, Numerical Problems on DO prediction.

UNIT – II

TREATMENT METHODS-I: Volume Reduction, Strength Reduction, Neutralization, Equalization and Proportioning.

TREATMENT METHODS-II: Removal of Inorganic suspended solids, Removal of Organic Solids, Removal of suspended solids and colloids. Treatment and Disposal of Sludge Solids.

UNIT – III

COMBINED TREATMENT: Feasibility of combined Treatment of Industrial Raw Waste with Domestic Waste, Discharge of Raw, Partially Treated and completely treated Wastes to Streams.

TREATMENT OF SELECTED INDUSTRIAL WASTE: Process flow sheet showing origin / sources of waste water, characteristics of waste, alternative treatment methods, disposal, reuse and recovery along with flow sheet. Effect of wastewater disposal on water bodies.

THE INDUSTRIES TO BE COVERED ARE:

1. Cotton Textile Industry
2. Tanning Industry
3. Cane Sugar Industry & Distillery Industry

UNIT – IV

TREATMENT OF SELECTED INDUSTRIAL WASTE-I:

1. Dairy Industry
2. Canning Industry
3. Steel and Cement Industry
4. Paper and Pulp Industry

5. Pharmaceutical Industry
6. Food Processing Industry

Reference Books:

1. Nelsol L. Nemerow, "Industrial Waste Water Treatment", **John Wiley & Sons Inc, 2009.**
2. Rao MN, and Dutta A.K., "Waste Water Treatment", Oxford & IBH Publishing Co. Pvt Ltd. 2008.
3. Metcalf and Eddy, "Waste Water Treatment, Disposal and Reuse", Tata McGraw Hill Publications, 2003.
4. Patwardhan A.D., "Industrial Wastewater Treatment", PHI Learning Private Ltd., New Delhi, 2009

Mahajan S.P., "Pollution Control Processes in industries", Tata McGraw Hill Publications,2004

BTCE15F8340	Highway Geometric Design	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Road safety and management

Course Objectives:

1. To understand the design aspects of road geometrics to address the practical problems in highway engineering.
2. To get the knowledge of selecting appropriate cross sectional elements of roads.
3. To understand the analysis of horizontal alignment& vertical alignment of roads.
4. To understand the design various types of intersections of roads.

Course Outcomes:

1. Select appropriate cross sectional elements of roads.
2. Analyse the horizontal alignment of roads.
3. Analyse the vertical alignment of roads.
4. Design various types of intersections of roads.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
	CO1	3	3	3	2						1		1	3	2	3	2

BTCE 15F8340	**CO2**	**3**	**3**	**3**	**2**			**2**		**3**	**3**			**3**	**3**	**3**	**2**
	CO3	**3**	**3**	**2**	**2**		**1**			**2**	**1**			**3**	**3**	**3**	**2**
	CO4	**3**	**3**			**2**					**2**	**3**	**2**	**3**	**3**		**1**

UNIT – 1 [Lecture Hours: 12]

Elements and controls of highway geometric design, pavement surface characteristic, camber, widths of carriageway and formation, road margins, right of way, typical cross sections, sight distance, stopping sight distance - numerical examples.

UNIT – 2 [Lecture Hours: 12]

Overtaking sight distance – analysis and derivation, sight distances at uncontrolled intersections, horizontal alignment – superelevation, extra widening of pavements, transition curves and set-back distances on horizontal curves - numerical examples.

UNIT – 3 [Lecture Hours: 12]

Vertical alignment - types of gradients, grade compensation along horizontal curves, design of summit curves, design of valley curves, engineering surveys for highway location, drawings and report preparation, design of hill roads, road humps - numerical examples.

UNIT – 4 [Lecture Hours: 12]

Intersections at grade – forms, unchannelized, channelized, median openings, rotary intersections, grade separated intersections, ramps, bus and pedestrian facilities, design standards for rural expressways - numerical examples.

REFERENCE BOOKS:

1. Khanna S.K and Justo C.E.G, “Highway Engineering”, Nemchand and Bros, Roorkee.
2. Kadiyali L.R, “Highway Engineering”, Khanna Publishers, Delhi.
3. Kadiyali L.R, “Traffic Engineering and Transportation Planning”, Khanna Publishers, Delhi.
4. AASHTO, “A Policy on Geometric Design of Rural Highways”, American Association of State Highway and Transportation Officials, Washington D C.
5. Indian Roads Congress, “Guidelines for Design of Horizontal Curves for Highways and Design Tables”, IRC: 38-1988, Indian Roads Congress, New Delhi.
6. Indian Roads Congress, “Recommended Practice for Sight Distance on Rural Highways”, IRC: 66-1976, Indian Roads Congress, New Delhi.
7. Indian Roads Congress, “Geometric Design Standards for Rural (Non-Urban) Highways”, IRC: 73-1980, Indian Roads Congress, New Delhi.
8. Indian Roads Congress, “Geometric Design Standards for Urban Roads in Plains”, IRC: 86-1983, Indian Roads Congress, New Delhi.

BTCE15F8410	Advanced design of pre-stressed concrete structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Design of Prestressed Concrete Structures

Course Learning Objectives:

1. To analyze the stresses in the end blocks and design reinforcement
2. To compute shear and torsional strengths and design reinforcement
3. To analyze and design composite sections
4. To analyze and design statically indeterminate prestressed concrete structures
5. To analyze and design tension and compression members, slab and grid floors
6. To analyze and design precast elements

Course Outcomes:

At the end of the course, the student is able

1. To analyze the stresses in the end blocks and design reinforcement, To compute shear and torsional strengths and design reinforcement
2. To analyze and design composite sections, To analyze and design statically indeterminate prestressed concrete structures
3. To analyze and design tension and compression members, slab and grid floors
4. To analyze and design precast elements

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
BTCE 15F8 410	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

UNIT -1

ANCHORAGE ZONE STRESSES IN POST-TENSIONED MEMBERS:

Introduction, stress distribution in end block, investigations on Anchorage Zone stresses, Magnel and Guyon's Methods, Comparative Analysis, Anchorage zone reinforcement.

SHEAR AND TORSIONAL RESISTANCE: Shear and principal stresses, ultimate shear resistance, design of shear reinforcement, Torsion, Design of reinforcement for torsion.

COMPOSITE SECTIONS: Introduction, Advantages, types, analysis of beams at serviceability limit state, stresses due to differential shrinkage, Ultimate moment of resistance, Design for flexural and shear strength.

UNIT – 2

STATICALLY INDETERMINATE STRUCTURES: Introduction, Advantages of continuous members, effect of prestressing in indeterminate structures, methods of analysis for secondary moments, concordant cable profile, Guyon's theorem, Ultimate load analysis, Design of continuous beams and portal frames.

UNIT – 3

TENSION MEMBERS: Introduction, Ties, Pressure pipes – fabrication process, analysis, design and specifications. Cylindrical containers - construction techniques, analysis, design and specifications.

COMPRESSION MEMBERS: Introduction, Columns, short columns, long columns, biaxially loaded columns, Design specifications.

UNIT – 4

SLAB AND GRID FLOORS: Types of floor slabs, Design of one way, two way and flat slabs. Distribution of prestressing tendons, Analysis and design of grid floors.

PRECAST ELEMENTS: Introduction, Prestressed concrete poles, manufacturing techniques, shapes and cross sectional properties, design loads, design principles. Railway sleepers-classification and Manufacturing techniques, design loads, analysis and design principles. Prestressed concrete pavements, slab and wall panels.

REFERENCE BOOKS:

1. Lin T.Y. and H. Burns - Design of Prestressed concrete structures - John Wiley & Sons, 1982.
2. N. Krishna Raju - Prestressed Concrete- Tata McGraw Hill, 3rd edition, , New Delhi-1995.
3. P. Dayaratnam, Prestressed Concrete Structures by Oxford & IBH Publishing Co. Pvt. Ltd., 5th Edition, 1991, New Delhi.
4. G.S. Pandit and S.P. Gupta – Prestressed Concrete- CBS Publishers, 1993, New Delhi.
5. N.C. Sinha & S.K. Roy, S.Fundamentals of prestressed concrete Chand and Co. Ltd.
6. by Praveen Nagarajan, Prestressed Concrete Design, Pearson, Delhi.
7. IS: 1343: 1980.

BTCE15F8420	Analysis and design of deep foundation	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Basic knowledge of Engineering Mechanics, Strength of Materials, Structural Analysis, Fluid Mechanics and Geotechnical Engineering

Course Objectives:

1. To analyze and interpret design different types of foundations;
2. To understand the design concepts of deep foundations,
3. To design well foundations and construction techniques of caissons and such other advanced type of foundations that are used in special circumstances

Course Outcomes:

An ability to

1. To analyse the single pile foundation.
2. Understand Dynamic analysis and load testsDynamic analysis.
3. To know efficiency of pile groups
4. Enumarate Constructional aspects of a drilled caissons

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O 1	PS O2	PS O3	PS O4
BTCE 15F8 420	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

Course Contents:

UNIT I

Single pile – Static capacity and lateral loads Introduction, Timber, Concrete, Steel piles, Corrosion of steel piles, Soil properties for static pile capacity, Ultimate static pile point capacity, Skin resistance, Static load capacity using Load – transfer, load test data. Tension piles – Piles for resisting uplift. Laterally loaded piles, Buckling of fully and partially embedded piles and poles. **12 hours**

UNIT II

Single pile – Dynamic analysis and load testsDynamic analysis, Pile driving, rational pile formula, other Dynamic formulae and general considerations. Reliability of dynamic pile driving formulae. The wave equation, pile load tests, Pile driving stresses, General comments on pile driving. **12 hours**

UNIT III

Pile foundations - Group. Single pile Vs Pile group, Pile group considerations, efficiency of pile groups, stresses on underlying strata from piles, settlements of pile groups, Pile caps, Batter piles, Negative skin friction, Matrix analysis for pile groups, Pile cap design by Computer. **12 hours**

UNIT IV

Types of Caissons, Bearing capacity, stress distribution and settlement, Design of drilled caissons elements, forces in drilled Caissons, design of elements of Caissons, Constructional aspects of a drilled caissons, Construction of Caissons, problems associated with installation, advantages and disadvantages of Caissons foundation, Comparison of Caisson types. **12 hours**

TEXT BOOKS

1.Joseph.E. Bowles "Foundation analysis and Design" McGraw Hill, International edition
2. S.P. Brahma "Foundation Engineering" Tata McGraw Hill publishing company Ltd, New Delhi.
3. Narayana M. Nayak "Foundation design Manual" Dhanpat Rai Publications
4. Purushotham Raj "Geotechnical Engineering" Tata McGraw Hill publishing company Ltd, New Delhi.

REFERENCE BOOKS

1. Poulos, H. G., and Davis. E. H., "Pile Foundation Analysis and Design", John Wiley and Sons, 1980.
2. Tomlinson. M. J., "Pile Design and Construction Practice", A view Point Publication, 1987.
3. Bell. F. G., "Methods of Treatment of Unstable Ground", Newnes- Butterworths, London, 1975.

BTCE15F8430	Earthquake Geotechnical Engineering	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Basic knowledge of Engineering Mechanics, Structural Analysis, Fluid Mechanics and Geotechnical Engineering

Course objectives:

1. To create an understanding basic concepts of elementary earthquakes as applied to seismic design of structures;
2. parameters influencing the seismic design;
3. hazards associated with an earthquake.

Course Outcomes:

An ability to

1. Understand the Development of site specification and code-based design
2. Analyse the effect of earthquake on soils, Evaluation of zone of liquefaction in field
3. Seismic design requirements for foundation, Seismic bearing capacity, Seismic settlement.
4. Maintenance and modifications to improve hazard resistance.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F8 510	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

Course Contents:

UNIT – 1

Earthquake Seismology – Causes of earthquake – seismic waves and magnitudes, Plate tectonics, Earthquake fault sources, Quantification of earthquake, Intensity and magnitudes, Earthquake source models, soils effects and liquefaction, Seismograph, Characteristics of ground motion. Effect of local site conditions on ground motions, Design earthquake, Design spectra, Development of site specification and code-based design. **12hrs**

UNIT – 2

Theory of vibration - Basic Definition - Governing equation for single degree freedom system - Forced vibrations - Rotating mass type excitation - Base excitation - Isolation vibration measuring instruments.Stress conditions on soil element under earthquake loading, **Liquefaction –** definition, Mechanism of liquefaction. Evaluation of zone of liquefaction in field.Evaluation of liquefaction using Standard Penetration Resistance. Factors affecting liquefaction and measures for anti-liquefaction. **12hrs**

UNIT – 3

Seismic Design of Foundations, Retaining Walls & Slopes

Seismic design requirements for foundation, Seismic bearing capacity, Seismic settlement, Design loads. Seismic slope stability analysis - Internal stability and weakening instability, Seismic design of retaining walls: Dynamic response of retaining walls, Seismic displacement of retaining walls, Seismic design consideration. **12hrs**

UNIT – 4

Earthquake Hazard Mitigation

Seismic risk vulnerability and hazard - Percept of risk - risk mapping - scale - hazard assessment - Maintenance and modifications to improve hazard resistance - Different type of foundation and its impact on safety - Ground Improvement Techniques. **12hrs**

Text Books:

1. KrammerS.L., Geotechnical Earthquake Engineering, prentice hall, international series, Pearson Education (Singapore) Pvt. Ltd., 2004.

2. KameswaraRao, Vibration Analysis and Foundation Dynamics, wheeler Publishing, New Delhi, 1998.
3. R. W. Day - Geotechnical Earthquake Engineering Handbook, McGraw-Hill, 2002.

References:

1. KameswaraRao, N.S.V., Dynamics soil tests and applications, Wheeler Publishing - New Delhi, 2000.
2. Kamalesh Kumar - Basic Geotechnical Earthquake Engineering – New Age International Publishers, 1st Edition, 2008.
3. Dowrick - Earthquake Resistant Design, John Wiley & Sons. Chowdhary, I., and Dasgupta, S. P.- Dynamics of Structures and Foundation

BTCE15F8510	Computer application in Civil Engineering	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Structural Analysis – II, Design of RCC Structural Elements

Course Objectives:

1. To analyze beams, trusses, rigid frames and grids using commercial software

2. To solve civil engineering problems such as SFD and BMD of statically determinate beams etc. using spreadsheets

3. To learn MATLAB and its applications to simple civil engineering problems

Course Outcomes:

1. Analysis of Plane Trusses and beams by using STADD-Pro or ETABS.
2. Analysis of Plane rigid jointed frames and grid frames by using STADD-Pro or ETABS.
4. Use of spread sheet such as EXCEL for solving the following Civil Engineering problems
5. MAT Lab application to simple civil engineering problems

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F8 510	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

Course Contents:

UNIT 1 : STRUCTURAL ANALYSIS

Analysis of Plane Trusses and beams by using STADD-Pro or ETABS or any other commercial software.

UNIT 2: STRUCTURAL ANALYSIS

Analysis of Plane rigid jointed frames and grid frames by using STADD-Pro or ETABS or any other commercial software.

UNIT3: SOLUTION OF CIVIL ENGINEERING PROBLEMS USING SPREAD SHEETS

Use of spread sheet such as EXCEL for solving the following Civil Engineering problems

i) Plotting of graphs such as SFD and BMD of statically determinate beams.

ii) Design of singly reinforced and doubly reinforced rectangular beam sections

iii) Computation of earthwork.

UNIT 4: APPLICATION OF MATLAB TO CIVIL ENGINEERING PROBLEMS

Introduction to MATLAB, application to simple civil engineering problems.

REFERENCE BOOKS:

1. Dr M.N.Shesha Prakash and Dr.G.S.Suresh, Computer Aided Design Laboratory- Lakshmi Publications
2. M.A.Jayaram, D.S.Rajendra Prasad, CAD Laboratory Sapna Publications, Bengaluru.
3. Roberts JT, -AUTOCAD 2002- BPB publications
4. Sham Tickoo, AUTOCAD 2004- A beginner's Guide, Wiley Dreamtech India Pvt Ltd.,
5. Ramesh Bangia, -Learning Excel 2002- Khanna Book Publishing Co (P) Ltd.,
6. Mathieson SA, Microsoft Excel- Starfire publishers
7. Rudra Pratap, Getting Started with MATLAB: A Quick Introduction for Scientists and Engineers Oxford University Press.

BTCE15F8520	Environmental Geotechnology	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Basic knowledge of Engineering Mechanics, Strength of Materials, Fluid Mechanics and Environmental Engineering

Course Objectives:

1. To create an ability to understand the sources and types of contaminations that are responsible for surface and subsurface contamination;
2. To analyze and interpret data related to the remediation techniques

Course Outcomes:

1. Need for contaminated site characterization
2. Detection of polluted zone, Monitoring and Effectiveness of designed facilities.
3. Planning of phased operation, leachate collection facility, gas collection facility, stability aspects, environmental monitoring systems.

4. Utilization of solid waste for soil improvement.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE15F 8520	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

Course Contents:

UNIT – 1 **12Hrs**

Sources and Site Characterization:

Introduction to Geo environmental engineering –Scope of Geo-environmental Engineering, Environmental cycle Various Sources of Contaminations, Classification of waste, Characteristics of different wastes and their management, Liquid waste characterization, Solid waste characterization, Hazardous waste characterization, Need for contaminated site characterization; Environmental Concerns with waste, Waste management strategies. Geotechnical properties of solid waste,Waste generation and disposal on land, Impact on environment.

UNIT – 2 **12Hrs**

Subsurface Contamination:

Sources of ground water contamination, Contaminant transport in sub surface – advection – diffusion – dispersion – governing equations – contaminant transformation – absorption – biodegradation – ion exchange – precipitation ground water pollution – pollution of aquifers by mixing of liquid waste – protecting aquifers, Effect of subsurface contamination, Detection of polluted zone, Monitoring and Effectiveness of designed facilities.

UNIT – 3 **12Hrs**

Land fill planning and design consideration:

Introduction, types of landfills, site selection for landfills, shape and size of landfills, landfill layout, landfill section, landfill capacity Liner and liner system, Cover and cover system, Stability of landfills. Site characterization, Planning of phased operation, leachate collection facility, gas collection facility, stability aspects, environmental monitoring systems, construction schedule, material requirement, equipment requirement, environmental control during operation, landfill closure and post closure plan.

UNIT – 4 **12Hrs**

Remediation Techniques:

Objectives of site remediation, various active and passive methods of remediation NAPL sites, Emerging Remediation Technologies. Rational approach to evaluate and remediate contaminated sites – monitored natural attenuation – exsitu and insitu remediation – solidification, bio – remediation, incineration, soil washing, electro kinetics, soil heating, verification, bio venting – Ground water remediation – pump and treat, air sparging, reactive well. Hazardous waste control and storage system – stabilization/ solidification of wastes mechanism of stabilization – organic and inorganic stabilization – utilization of solid waste for soil improvement.

Text Books:

1. Sharma, H. D. and Reddy, K. R. - Geoenvironmental Engineering, John Wiley & Sons (2004)
2. Rowe, R. K. - Geotechnical &Geoenvironmental Engineering Handbook
3. Rowe, R. K. - Geotechnical &Geoenvironmental Engineering Handbook, Kluwer Academic, 2001
4. Reddi, L. N. and Inyang, H. I. - Geoenvironmental Engineering Principles and Applications, Marcel. Dekker, Inc., New York (2000).

References:

1. LaGrega, M. D., Buckingham, P. L. and Evans, J. C. - Hazardous Waste Management, New York: McGraw-Hill, 2001
2. Phillip B. Bedient, Refai, H. S. & Newell C. J. - Ground Water Contamination – Prentice Hall Publications, 4th Edition, 2008
3. Daniel, B.E., Geotechnical Practice for waste disposal, Chapman and Hall, London, 1993.
4. Westlake, K., (1995), Landfill Waste pollution and Control, Albion Publishing Ltd., England, 1995.

BTCE15F8530	Traffic Engineering & Management	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisites:

Traffic Engineering

Course Objectives:

1. To educate students about the importance of traffic engineering as applied to road transportation and features of traffic characteristics.
2. To make students familiar with the various traffic studies conducted and the methods of analyzing and presenting the data.
3. To give students an overview of the requirements of intersections, types of intersections and grade separators.
4. To make students appreciate the necessity of traffic regulations, types of traffic regulations and design of traffic regulations

Course Outcomes:

On successful completion of this course, students should be able to:

1. Outline the scope of traffic engineering, describe the road user characteristics and discuss the characteristics of different classes of vehicles.
2. Explain the necessity and methods of conducting various traffic studies and analyse the data collected to be presented in the form relevant to the purpose.
3. Enumerate: features and requirements of intersections, forms and types of intersections, and outline the features of: grade separators, underpasses, overpasses, interchanges.
4. Associate the traffic regulations to the safe and efficient operation of traffic, to identify the control measures and to design the basic regulatory devices.

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F8 530	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

Course Contents:

UNIT – 1

Scope of traffic engineering & study of its elements – Introduction, objectives and scope of traffic engineering,Components of road traffic, road user characteristics –physical and psychological, vehicle characteristics- static and dynamic. **Traffic stream characteristics**- relationship between speed, flow and density – Numerical examples. **12 hrs**

UNIT – 2

Traffic Engineering Studies and Analysis: methods of traffic study, equipment, data collection, analysis and interpretation of - Speed studies, Travel time and Delay studies, Volume studies, Origin – destination studies, Parking studies and Accident Studies. Capacity studies- Introduction, highway capacity, level of service, basic freeway capacity studies. **Sampling in traffic studies** – Numerical examples. **12 hrs**

UNIT – 3

Design and Management of traffic control measures – need, control of traffic movements through time sharing and space sharing concepts,Design of channelizing islands, T, Y, skewed, staggered, round about and other at grade intersections, provision for safe crossing of pedestrians and cyclists – grade separated intersection. **12 hrs**

UNIT – 4

Traffic control devices – traffic signs, markings and islands. Different methods of signal design, signal system and co-ordination. **Traffic Regulation**- Road lighting, Regulations on vehicles, drivers, and traffic. **Traffic engineering impacts on environment** – air and noise pollution, impacts on land development, technological approaches to improving environment.

12 hrs

LIST OF EXPERIMENTS:

1. Calculation of PCU
2. Spot Speed Survey and Analysis
3. Traffic Volume Survey and Analysis
4. Traffic Growth Rate Estimation
5. Signal Design I
6. Signal Design II

Reference Books:

1. Kadiyali. L. R., "Traffic Engineering and Transport planning", Khanna publishers, New Delhi.
2. Khanna S.K and Justo C.E.G, "Highway Engineering", Nemchand and Bros, Roorkee.
3. Papacostas, C.A., "Fundamentals of Transportation Engineering", Prentice-Hall of India Private Limited, New Delhi.
4. William R. Mc Shane and Roger P. Roess,, "Traffic Engineering", Prentice hall, New Jersey, 2000.
5. Matson, Smith and Hurd, "Traffic Engineering", McGraw Hill and Co, New York.

BTCE15F8540	Earthquake Resistant Design of Structures	L	T	P	C	Hrs/Wk
Duration :16 Wks		3	1	0	4	5

Prerequisite:

Structural Dynamics

Course Objectives:

1. To learn about causes, types, magnitude and intensity of earthquakes
2. To learn about seismic design provisions of Code
3. To learn about characterization of earthquake ground motion, structural modeling etc.
4. To learn about seismic evaluation and retrofitting methods
5. To learn about seismic design philosophy, seismic performance and methods of seismic analysis
6. To analyze and design RC and masonry buildings for seismic forces

Course Outcomes:

At the end of the course, the student

1. Has learnt about causes, types, magnitude and intensity of earthquakes
2. Has learnt about seismic design provisions of Code

3. Has learnt about characterization of earthquake ground motion, structural modeling etc.Has learnt about seismic evaluation and retrofitting methods
4. Has learnt about seismic design philosophy, seismic performance and methods of seismic analysis and is able to analyze and design RC and masonry buildings for seismic forces

Mapping of Course Outcomes with programme Outcomes

Course Code	POS/ COs	PO 1	P 0 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	P S O 1	PS O2	PS O3	PS O4
BTCE 15F8 540	CO1	3	3	2	2	2	1	1			1	1	3	3	3	3	3
	CO2	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO3	3	3	2	3	2	1	1	1		1	1	3	3	3	3	3
	CO4	3	1	2	1	3	1	2	1			3	3	3	3	3	3

Course Contents:

UNIT - 1

Engineering Seismology Earthquake ground Motion,Theory of plate tectonics, seismic waves, Magnitude and intensity of earthquakes, local site effects, seismic zoning map of India. Types of Earthquakes.

UNIT - 2

Seismic Design Parameters, earthquake ground motion characteristics, response spectra and design spectrum. Structural modelling, Code based seismic design methods. Response control concepts, seismic evaluation and retrofitting methods. Numerical problems.

UNIT - 3

Effect of Structural Irregularities on seismic performance of RC buildings, Vertical irregularity and plan configuration problems, Seismo resistant building architecture, lateral load resistant systems, building characteristics.

Seismic design philosophy, Determination of design lateral forces - Equivalent lateral force procedure, dynamic analysis procedure. Step by step procedure for seismic analysis of RC buildings (without infill's), Equivalent static lateral force method, response spectrum methods, Numerical problems.

UNIT – 4

Earthquake resistant design of RC buildings - Codal provisions, loads, load combinations and detailing of reinforcement.

Earthquake resistant design of masonry buildings - elastic properties of structural masonry, Codal provisions, Design of two storied masonry building.

REFERENCE BOOKS:

1. Pankaj Agarwal, **Earthquake resistant design of structures** Manish Shrikande - PHI India.
2. S.K. Duggal, **Earthquake Resistant Design of Structures** Oxford University Press, 2007.
3. Anil Chopra, **Earthquake Dynamics of Structures** EERI,
4. S.F. Borg, **Earth Quake Engineering Damage Assessment and Structural design** (John Wiley and Sons. 1983.
5. IS 1893 (Parts 1 to 5), IS 4326-1993, 13920-1993.

SCHOOL OF MANAGEMENT STUDIES

B.B.A (Industry Integrated)

HAND BOOK

Rukmini Educational
Charitable Trust

A Unit of DivyaSree

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Kattigenahalli, Yelahanka, Bangalore - 560 064
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MESSAGE FROM THE HON'BLE CHANCELLOR

P. Shyama Raju
Chancellor
REVA University

Education during recent years has witnessed a great transformation. Today's society, termed as "Knowledge Society" has brought about unprecedented economic and social growth. This has propelled universities across the world to devise new ways of tapping human potential for different competencies and building a vibrant society with a win-win situation for all.

REVA University has seen the light of the day to imbibe this character of paradigm shift in academic pursuits to contribute to the knowledge society. REVA works hard to bring in you an exciting and rewarding educational experience, to discover new interests and to develop your career prospects. You will benefit from a unique approach to student-centered outcome based learning through group work and individual study tackling real world challenges under the guidance of committed teachers, researchers and well experienced practitioners.

REVA has excellent learning facilities including custom built teaching facilities designed specifically to emulate working conditions, air-conditioned library opened for your studies from early morning till midnight and facilities for variety of sports and cultural activities.

Our faculties have introduced socially relevant and market driven engineering courses after studying the requirements of industries and other sectors of employment in detail and consulting entrepreneurs, experts in different areas of engineering and industries and other stake-holders. I am glad that the Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) adopted by the University will facilitate learning environment under continuous guidance and monitoring by the faculty members and equip you with competent skills to opt for different job prospects across the global. Our most modernised Career Development Centre not only helps you in inculcating communication proficiency skills in respective areas, but also facilitate opportunities for campus selection by top notched companies and Corporates.

I hope that the present scheme of instructions, continuous periodic progress assessments, course curriculum of BBA (Honors) and other information provided in this hand book will guide you to choose appropriate courses of study and move ahead in the right direction in your chosen area of study. I hope you will enjoy and experience the curriculum, the student-centered teaching and learning ambience in developing your personality to become successful professionals, entrepreneurs and proud citizens of the country.

I wish you every success in your career.

MESSAGE FROM THE VICE-CHANCELLOR

The curriculum of an institution of higher learning is a living entity. It evolves with time; it reflects the ever changing needs of the society and keeps pace with the growing talent of the students and the faculty. The curriculum of the BBA, MBA, and other programs of REVA University is no exception.

An experience of a decade in preparing graduates and postgraduates in commerce, management studies, engineering, architecture, law, science and arts for a wide variety of industries & research level organizations has led to creation of the new curriculum. I sincerely believe that it will meet the aspirations of all stake holders – students, faculty and the employers of the graduates and postgraduates of REVA University.

The curriculum has been designed in such a way that the teacher enjoys freedom to expand it in any direction he feels appropriate and incorporates the latest knowledge and stimulates the creative minds of the students. There is also provision for new experiments with new contents and new techniques. This is going to lead to new teaching – learning paradigm with experiential, experimental & industry relevant approaches. The present curriculum is contemporary because it is culmination of efforts of large number of faculty members, experts from industries and research level organizations.

I am very sure that all students of REVA University enjoy this curriculum and take fullest advantage to expose themselves to fundamentals and applications. Also, imbibe all attributes that are required to term them as Global Leaders. The innovativeness and creativity being introduced should be explored fully by our students.

The flexibility in the curriculum permits staff and students to incorporate changes in terms of addition of new courses and deletion of irrelevant courses keeping the rapid advances in the technology into consideration.

I record my personal gratitude to Chancellor, and members of Academic Council who have lent every bit of their wisdom to make this curriculum truly superior. I also wish that this Handbook containing a brief overview of regulations, do's and don'ts, scheme of instructions and the detailed syllabus of B Com program will guide the students to move in the right direction to accomplish all round development of their personalities and succeed with flying colours not only in earning degree but also in their future career as leaders.

Dr. S.Y.Kulkarni
Vice-Chancellor

Director's Message

Talent Development @ REVA University

Today, as you prepare to join our campus and start the next chapter of your lives, in what can only be described as an increasingly divided and fast-shifting world, I want to offer some thoughts specific to the challenging times in which we find ourselves. Your responsibilities as Management student to lead businesses are more important today than ever. You are entering into a world in which trust and faith in business has declined significantly, and you have to develop the personality reflecting honesty and trust, per se.

My hope is that the many discussions you will have, in courses as varied as Leadership and Corporate Accountability and Finance, Ethical Management, Governance, HRM, HR, will give you tools and perspectives that will serve as a guide to you in the future. I hope you will develop, and will continue to develop, both the competence and character of true leadership. You will need both to fulfill your responsibility to rebuild trust.

Many of our alumni currently lead some of the most admired and most valuable companies on the planet. They have been crucial to the creation and evolution of entire industries, including management consulting, mutual funds, private equity, venture capital, and social
entrepreneurship, HR, Marketing, Entrepreneurship, and the like. We develop Three types of behavior in this school: 1. Modesty; 2. Honesty; and 3. Winning Attitude, focusing on knowledge, skills, and competency.

The Curriculum caters to and has relevance to local, regional, national, and global development needs. A maximum number of courses are integrated with cross-cutting issues with relevant to professional ethics, gender, human values, environment and sustainability.

Finally we ask that you RESPECT the people who are most important in your lives, and everyone with whom you interact along your road to leadership. Remember that nothing can be accomplished without the help of everyone in REVA University. show respect on a daily basis to everyone you interact with: your co-students. As students, you will often get more credit than you deserve; be sure to share this credit by giving respect to all who contribute to any success. Let me in that spirit take a moment to thank your parents, guardian who have collectively helped to educate you and bring you to this wonderful moment of Management World at REVA University.

As you begin this exciting journey, I wish you all the best.

Dr. M M Bagali
Director
School of Management Studies

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RUKMINI EDUCATIONAL CHARITABLE TRUST

It was the dream of late Smt. Rukmini Shyama Raju to impart education to millions of underprivileged children as she knew the importance of education in the contemporary society. The dream of Smt. Rukmini Shyama Raju came true with the establishment of Rukmini Educational Charitable Trust (RECT), in the year 2002. **Rukmini Educational Charitable Trust** (RECT) is a Public Charitable Trust, set up in 2002 with the objective of promoting, establishing and conducting academic activities in the fields of Arts, Commerce, Education, Engineering, Environmental Science, Management and Science & Technology, among others. In furtherance of these objectives, the Trust has set up the REVA Group of Educational Institutions comprising of REVA Institute of Technology & Management (RITM), REVA Institute of Science and Management (RISM), REVA Institute of Management Studies (RIMS), REVA Institute of Education (RIE), REVA First Grade College (RFGC), REVA Degree College (Evening), REVA Independent PU College at Kattigenahalli, Ganganagar and Sanjaynagar and now REVA University. Through these institutions, the Trust seeks to fulfill its vision of providing world class education and create abundant opportunities for the youth of this nation to excel in the areas of Engineering, Architecture, Commerce, Management, Education, Law and Arts, and Science & Technology.

Every great human enterprise is powered by the vision of one or more extraordinary individuals and is sustained by the people who derive their motivation from the founders. The Chairman of the Trust is Dr. P. Shyama Raju, a developer and builder of repute, a captain of the industry in his own right and the Chairman and Managing Director of the DivyaSree Group of companies. The idea of creating these top notch educational institutions was born of the philanthropic instincts of Dr. P. Shyama Raju to do public good, quite in keeping with his support to other socially relevant charities such as maintaining the Richmond road park, building and donating a police station, gifting assets to organizations providing accident and trauma care, to name a few.

The Rukmini Educational Charitable Trust drives with the main aim to help students who are in pursuit of quality education for life. REVA is today a family of ten institutions providing education from PU to Post Graduation and Research leading to M. Phil and PhD degrees. REVA has well qualified experienced teaching faculty of whom majority are doctorates. The faculty is supported by committed administrative and technical staff. Over 11,000 students study various courses across REVA's three campuses equipped with exemplary state-of-the-art infrastructure and conductive environment for the knowledge driven community.

ABOUT REVA UNIVERSITY

REVA University has been established under the REVA University Act, 2012 of Government of Karnataka and notified in Karnataka State Gazette No. 80 dated 27thFebruary, 2013. The University is empowered by UGC to award degrees any branch of knowledge under Sec.22 of the UGC Act. The University is a Member of Association of Indian Universities, New Delhi. The main objective of the University is to prepare students with knowledge, wisdom and patriotism to face the global challenges and become the top leaders of the country and the globe in different fields.

REVA University located in between Kempegowda International Airport and Bangalore city, has a sprawling green campus spread over 45 acres of land and equipped with state-of-the-art infrastructure that provide conducive environment for higher learning and research. The REVA campus has well equipped laboratories, custom-built teaching facilities, fully air-conditioned library and central computer centre, the well planned sports facility with cricket ground, running track & variety of indoor and outdoor sports activities, facilities for cultural programs. The unique feature of REVA campus is the largest residential facility for students, faculty members and supportive staff.

The University is presently offering 23 Post Graduate Degree programs, 20 Degree and PG Degree programs in various branches of studies and has 12000+ students studying in various branches of knowledge at graduate and post graduate level and 302 Scholars pursuing research leading to PhD in 18 disciplines. It has 800+ well qualified, experienced and committed faculty members of whom majority are doctorates in their respective areas and most of them are guiding students pursuing research leading to PhD.

The programs being offered by the REVA University are well planned and designed after detailed study with emphasis with knowledge assimilation, applications, global job market and their social relevance. Highly qualified, experienced faculty and scholars from reputed universities / institutions, experts from industries and business sectors have contributed in preparing the scheme of instruction and detailed curricula for this program. Greater emphasis on practice in respective areas and skill development to suit to respective job environment has been given while designing the curricula. The Choice Based Credit System and Continuous Assessment Graded Pattern (CBCS – CAGP) of education has been introduced in all programs to facilitate students to opt for subjects of their choice in addition to the core subjects of the study and prepare them with needed skills. The system also allows students to move forward under the fast track for those who have the capabilities to surpass others. These programs are taught by well experienced qualified faculty

supported by the experts from industries, business sectors and such other organizations. REVA University has also initiated many supportive measures such as bridge courses, special coaching, remedial classes, etc., for slow learners so as to give them the needed input and build in them confidence and courage to move forward and accomplish success in their career. The University has also entered into MOUs with many industries, business firms and other institutions seeking their help in imparting quality education through practice, internship and also assisting students' placements.

REVA University recognizing the fact that research, development and innovation are the important functions of any university has established an independent Research and Innovation division headed by a senior professor as Dean of Research and Innovation. This division facilitates all faculty members and research scholars to undertake innovative research projects in engineering, science & technology and other areas of study. The interdisciplinary-multidisciplinary research is given the top most priority. The division continuously liaisons between various funding agencies, R&D Institutions, Industries and faculty members of REVA University to facilitate undertaking innovative projects. It encourages student research projects by forming different research groups under the guidance of senior faculty members. Some of the core areas of research wherein our young faculty members are working include Data Mining, Cloud Computing, Image Processing, Network Security, VLSI and Embedded Systems, Wireless Censor Networks, Computer Networks, IOT, MEMS, Nano- Electronics, Wireless Communications, Bio-fuels, Nano-technology for coatings, Composites, Vibration Energies, Electric Vehicles, Multilevel Inverter Application, Battery Management System, LED Lightings, Renewable Energy Sources and Active Filter, Innovative Concrete Reinforcement, Electro Chemical Synthesis, Energy Conversion Devices, Nano-structural Materials, Photo-electrochemical Hydrogen generation, Pesticide Residue Analysis, Nano materials, Photonics, Nana Tribology, Fuel Mechanics, Operation Research, Graph theory, Strategic Leadership and Innovative Entrepreneurship, Functional Development Management, Resource Management and Sustainable Development, Cyber Security, General Studies, Feminism, Computer Assisted Language Teaching, Culture Studies etc.

The REVA University has also given utmost importance to develop the much required skills through variety of training programs, industrial practice, case studies and such other activities that induce the said skills among all students. A full-fledged Career Development and Placement (CDC) department with world class infrastructure, headed by a dynamic experienced Professor & Dean, and supported by well experienced Trainers, Counselors and Placement Officers.

The University also has University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director facilitating skill related training to REVA students and other unemployed students. The University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal Vikas Yojana. The Centre conducts several add-on courses in challenging areas of development. It is always active in facilitating student's variety of Skill Development Training programs.

The University has collaborations with Industries, universities abroad, research institutions, corporate training organizations, and Government agencies such as Florida International University, Okalahoma State University, Western Connecticut University, University of Alabama, Huntsville, Oracle India Ltd, Texas Instruments, Nokia University Relations, EMC^2, VMware, SAP, Apollo etc, to facilitate student exchange and teacher–scholar exchange programs and conduct training programs. These collaborations with foreign universities also facilitates students to study some of the programs partly in REVA University and partly in foreign university, viz, M.S in Computer Science one year in REVA University and the next year in the University of Alabama, Huntsville, USA.

The University has also given greater importance to quality in education, research, administration and all activities of the university. Therefore, it has established an independent Internal Quality division headed by a senior professor as Dean of Internal Quality. The division works on planning, designing and developing different quality tools, implementing them and monitoring the implementation of these quality tools. It concentrates on training entire faculty to adopt the new tools and implement their use. The division further works on introducing various examination and administrative reforms.

To motivate the youth and transform them to become innovative entrepreneurs, successful leaders of tomorrow and committed citizens of the country, REVA organizes interaction between students and successful industrialists, entrepreneurs, scientists and such others from time to time. As a part of this exercise great personalities such as Bharat Ratna Prof. C. N. R. Rao, a renowned Scientist, Dr. N R Narayana Murthy, Founder and Chairman and Mentor of Infosys, Dr. K Kasturirangan, Former Chairman ISRO, Member of Planning Commission, Government of India, Dr. Balaram, Former Director IISc., and noted Scientist, Dr. V S Ramamurthy, Former Secretary, DST, Government of India, Dr. V K Aatre, noted Scientist and former head of the DRDO and Scientific Advisor to the Ministry of Defence Dr. Sathish Reddy, Scientific Advisor, Ministry of Defence, New Delhi and many others have accepted our invitation and blessed our students and faculty members by their inspiring addresses and interaction.

As a part of our effort in motivating and inspiring youth of today, REVA University also has instituted awards and prizes to recognize the services of teachers, researchers, scientists, entrepreneurs, social workers and such others who have contributed richly for the development of the society and progress of the country. One of such award instituted by REVA University is 'Life Time Achievement Award' to be awarded to successful personalities who have made mark in their field of work. This award is presented on occasion of the "Founders' Day Celebration" of REVA University in presence of dignitaries, faculty members and students gathering and the first "REVA Life Time Achievement Award" for the year 2015 has been awarded to Shri. Kiran Kumar, Chairman ISRO on the occasion of Founder's Day Celebration, 6th January, 2016 and the second "REVA Life Time Achievement Award" for the year 2016 has been awarded to Shri. Shekhar Gupta, Renowned Journalist on the occasion of Founder's Day Celebration, 6th January, 2017.

REVA organises various cultural programs to promote culture, tradition, ethical and moral values to our students. During such cultural events the students are given opportunities to unfold their hidden talents and motivate them to contribute innovative ideas for the progress of the society. One of such cultural events is REVAMP conducted every year. The event not only gives opportunities to students of REVA but also students of other Universities and Colleges. During three days of this mega event students participate in debates, Quizzes, Group discussion, Seminars, exhibitions and variety of cultural events. Another important event is Shubha Vidaaya, - Graduation Day for the final year students of all the programs, wherein, the outgoing students are felicitated and are addressed by eminent personalities to take their future career in a right spirit, to be the good citizens and dedicate themselves to serve the society and make a mark in their respective spheres of activities. During this occasion, the students who have achieved top ranks and won medals and prizes in academic, cultural and sports activities are also recognised by distributing awards and prizes. The founders have also instituted medals and prizes for sports achievers every year. The physical education department conducts regular yoga classes everyday to students, faculty members, administrative staff and their family members and organises yoga camps for villagers around.

Recognizing the fast growth of the university and its quality in imparting higher education, the BERG (Business Excellence and Research Group), Singapore has awarded BERG Education Award 2015 to REVA University under Private Universities category. The University has also been honoured with many more such honors and recognitions.

ABOUT SCHOOL OF MANAGEMENT STUDIES

The School of Management Studies offers Industry Integrated Programs that reduce the widening gap between Industry – Academia. BBA - a degree in Management Studies (Industry Integrated) provides adequate scope to enter wide range of business spheres, which is depicted in various core subjects offered within the program. This course enriches the students to enable them to work in different national and multinational organizations and face the global challenges arising there from. It not only aims at imparting knowledge and skills in different areas of management and accounting, but also provides inputs necessary for the overall development of the personality of the students. It also enables the students right from the inception to get equipped with required skills through continuous efforts by adopting various methods like case studies, group discussions / analysis, simulation, games, debates, seminars, quiz and the like. The students are groomed with the right exposure to the practical events in the global market milieu.

The Masters degree in Management Studies not only induces research culture and Entrepreneurship but also provides practical exposure and much needed soft skills. During 2014-15 the School of Management Studies is offering one full time Graduate and Post Graduate programs.

The programs offered by REVA University are well planned and designed after detailed study with emphasis on knowledge assimilation, applications, global job market and their social relevance. Highly qualified, experienced faculty and scholars from reputed universities, institutions, experts from industries and business sectors have contributed in preparing schemes of instruction and curriculum for these programs.

VISION OF THE OF MANAGEMENT STUDIES

- "To produce world class Management experts through the excellent teaching and research so as to offer professional services at National and International levels"

MISSION

- To provide high-standard, forward-looking, morally, socially and ethically responsive, coherent, interdisciplinary and career-oriented programs in a dynamic global education environment.

- To contribute to the enrichment and dissemination of knowledge through theoretical, applied and problem-oriented research for the benefit of students, faculty, and society in general;

- To serve the community by undertaking customer-oriented research, providing training and professional consultation for business, industry and government and pursue research in partnership with business and governmental organizations.

VALUES

1 Excellence in all our academic and research endeavors
2 Dedication and service to our stakeholders
3 Leadership through innovation
4 Accountability and transparency
5 Creating conducive academic environment with service motto
6 Integrity and intellectual honesty
7 Ethical and moral behavior
8 Freedom of thought and expression
9 Adaptability to the change
10 Team-work

"Seven Deadly Sins

Wealth without work
Pleasure without conscience
Science without humanity
Knowledge without character
Politics without principle
Commerce without morality
Worship without sacrifice."

— Mahatma Gandhi

Program Educational Objectives (PEO)

PEO 1: Graduate after successful completion of the Program will be able to take up career in Public, Private and Corporate organizations.

PEO 2: Graduates after completion of the program will be able to work with diverse teams and are expected to take better decisions in complex situations.

PEO 3: Graduates will be able to incorporate social, ethical and moral principles in professional and personal life.

Program Specific Outcomes (PSO)

PSO	Description
PSO1	Demonstrate understanding of the basic concepts and theoretical knowledge used in the different commerce and business-related areas.
PSO2	Develop ideas for start –ups through knowledge and skills developed during the course of the degree.
PSO3	Apply different tools and techniques in solving problems related to Business.

Program Outcomes

The School of Management studies was established in the year 2014 and since then the School has defined Program Outcomes for the courses offered during the Board of Studies meeting. Based on the advice and suggestions of the BOS, EIGHT Program Outcomes have been formulated, keeping in view the Vision, Mission and Program Educational Objectives.

Description of the Program Outcomes

PO	Description
PO1	Communicate effectively with various stake - holders
PO2	Foster Analytical and critical thinking abilities for data – based decision making

PO3	Ability to develop Value based leadership Ability
PO4	Ability to understand, analyze and communicate global, economic, legal and ethical aspects of business
PO5	Engage in Research and apply statistical tools and techniques for Problem solving and decision making.
PO6	Enhance skills required for a particular domain by integrating practical and theoretical knowledge
PO7	Gain knowledge through inter- disciplinary and Multi – disciplinary courses
PO8	Apply knowledge of Theory and Practices to solve business problems

Advisory Board

1	**Dr. B. Mahadevan** Professor, IIM – Bangalore, Bannerghatta Road, Bangalore Phone: +91-80-26993275 E-mail: b.mahadevan@iimb.ernet.in
2	**Dr S Nayana Tara** Professor IIM- Bangalore, Bannerghatta Road, Bangalore Phone: +91-80-26993082 E-mail: tara@iimb.ernet.in
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10	**Dr. Teerooven Soobaroyen** School of Management, Faculty of Business and Law University of Southampton, Highfield, Southampton, SO17 1BJ, UK Email: t.soobaroyen@soton.ac.uk
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12	**Dr. Shanthi S K** Chair Professor - Union Bank Center for Banking Excellence, Greta Lakes University, Chennai--6303102 Email: shanthi.sk@greatlakes.edu.in
13	**Mr. Nagaraj Kulkarni** Director, Compgence Bangalore. Mobile: 9980540426 Email:- nagarjkulkarni@compegence.com

CBCS (CHOICE BASED CREDIT SYSTEM) AND CAGP (CONTINUOUS ASSESSMENT AND GRADING PATTERN) OF EDUCATION AND ITS ADVANTAGES

CBCS is a proven, advanced mode of learning in higher education. It facilitates students to have freedom in making their own choices for acquiring a Degree / Masters Degree program. It is more focused towards the student's choice in providing a wide range of modules available in a single campus across various disciplines offered by experts in the subjects. It leads to quality education with active teacher-student participation.

Studying under CBCS has following advantages:

- Students may undergo training in cross-disciplinary and multi-disciplinary subjects and acquire more focused and preferred knowledge.
- Students may get more skills from other subject(s) which are required for the career path in addition to their regular subject knowledge.
- Students may get ample opportunities to use the laboratories and gain practical exposure to the much needed modules available in other departments/schools for want of scientific inputs.
- Courses are conducted by subject experts identified on the basis of their experiences. Courses taught by such experts may provide in-depth information and clear understanding of the modules.
- Students may get an opportunity to study courses with other students of different programs and exchange their views and knowledge in a common class room.
- CBCS provides a cross-cultural learning environment.
- Students may benefit much from selecting the right options to successfully face the public service examinations like UPSC, KPSC, IES wherein the knowledge of additional subjects become mandatory for general or optional papers.
- Students are exposed to the culture of universal brotherhood during their campus life.
- Students are allowed to practice various methods of learning a subject.

Summary of REVA University Regulations for Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) for Three Years Graduate Degree Programs, 2016

1. **Teaching and Learning Process:**
   The teaching & learning process under CBCS – CAGP of education in each course of study will have three components, namely**:**

   (i) L= Lecture (ii) T= Tutorial (iii) P=Practice; where:

   L stands for **Lecture** session consisting of classroom instruction.

   T stands for **Tutorial** session consisting participatory discussion / self study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes.

   P stands for **Practice** session and it consists of Hands on Experience / Laboratory Experiments / Field Studies / Case Studies that equip students to acquire the much required skill component.

2. **Courses of Study and Credits**
   a. The study of various subjects in BBA degree program is grouped under various courses. Each of these courses carries credits which are based on the number of hours of teaching and learning.
   b. In terms of credits, every **one hour session of L amounts to 1 credit per Semester** and a minimum of **two hour session of T or P amounts to 1 credit per Semester or a three hour session of T / P amounts to 2 credits** over a period of one Semester of 16 weeks for teaching-learning process.
   c. **The total duration of a semester is 20 weeks inclusive of semester-end examination.**
   d. **A course shall have either or all the four components.** That means a course may have only lecture component, or only practical component or combination of any two or all the three components.
   e. The total credits earned by a student at the end of the semester upon successfully completing the course are L + T + P. **The credit pattern of the course is indicated as**
      L: T: P

   Different C**ourses of Study** are labeled and defined as follows:

a. Core Course:

A course which should compulsorily be studied by a candidate as a core-requirement is termed as a Core course. The CORE courses of Study are of THREE types, viz – (i) Foundation Course, (ii) Hard Core Course, and (iii) Soft Core Course.

b. Foundation Course (FC):

The foundation Course is a core course which should be completed successfully as a part of graduate degree program irrespective of the branch of study. These would include basic courses in Languages, courses of study prescribed by the University.

c. Hard Core Course (HC):

The **Hard Core Course** is a Core Course in the main branch of study and related branch(es) of study, if any that the candidates have to complete compulsorily.

d. **Soft Core Course (SC):**

A Core course may be a **Soft Core** if there is a choice or an option for the candidate to choose a course from a pool of courses from the main branch of study or from a sister/related branch of study which supports the main branch of study.

e. O**pen Elective Course:**

An elective course chosen generally from other discipline / subject, with an intention to seek exposure to the basics of subjects other than the main discipline the student is studying is called an O**pen Elective Course.**

f. Project Work / Dissertation:

Project work / Dissertation work is a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A project work carrying **FOUR or SIX** credits is called **Minor Project** work / **Dissertation.** A project work of **EIGHT, TEN, TWELVE or SIXTEEN** credits is called **Major Project** work / **Dissertation**. **A Minor Project work may be a hard core or a Soft Core as decided by the BOS / concerned. But the Major Project shall be Hard Core.**

3. Scheme, Duration and Medium of Instructions:

3.1. The Three Year Degree program is of 6 semesters - 3 years duration. A candidate can avail a maximum of 12 semesters - 6 years as per double duration norm, in one

stretch to complete the Three Year Degree, including blank semesters, if any. Whenever a candidate opts for blank semester, he/she has to study the prevailing courses offered by the School when he/she resumes his/her studies.

3.2. The medium of instruction shall be English.

4. Credits and Credit Distribution

4.1. A candidate has to earn 144 credits for successful completion of Three Year BBA degree (150credits for successful completion of Three Year BBA (Honors) degree) with the distribution of credits for different courses as decided by the Board of Studies.

4.2. The concerned BOS based on the credits distribution pattern given above shall prescribe the credits to various types of courses and shall assign title to every course including project work, practical work, field work, self study elective, as **Foundation Course(FC), Hard Core(HC) or Soft Core(SC) or Open Elective(OE)**.

4.3**.** A candidate can enroll for a maximum of 30 credits and a minimum of 20 credits per Semester. However he / she may not successfully earn a maximum of 30 credits per semester. This maximum of 30 credits does not include the credits of courses carried forward by a candidate.

4.4. Only such full time candidates who register for a minimum prescribed number of credits in each semester from I semester to VI semester and complete successfully 144 credits (150 credits in case of Honors program) in 6 successive semesters shall be considered for declaration of Ranks, Medals, Prizes and are eligible to apply for Student Fellowship, Scholarship, Free ships, and such other rewards / advantages which could be applicable for all full time students and for hostel facilities.

5. Add- on Proficiency Certification:

To acquire **Add on Proficiency Certification** a candidate can opt to complete a minimum of 4 extra credits either in the same discipline /subject or in different discipline / subject in excess to 144 credits required for BBA – Industry Integrated Degree program.

6. Add on Proficiency Diploma:

6.1. To acquire **Add on Proficiency Diploma,** a candidate can opt to complete a minimum of 18 extra credits either in the same discipline /subject or in different discipline / subject in excess to 144 credits required for BBA – Industry Integrated Degree program.

6.2. The A**dd on Proficiency Certification / Diploma** so issued to the candidate contains the courses studied and grades earned.

7. Scheme of Assessment & Evaluation

7.1. The Scheme of Assessment and Evaluation will have two parts, namely;

i. Internal Assessment (IA); and
ii. Semester End Examination

7.2. Assessment and Evaluation of each Course shall be for 100 marks. The Internal Assessment and Semester End Examination of UG non engineering programs and PG programs shall carry 50 marks each (i.e., 50 marks internal assessment; 50 marks semester end examination).

7. 3. The 50 marks of Internal Assessment shall comprise of:

Internal Test	= 30 marks
Assignments	= 10 marks
Seminars	= 10 marks

7.4. There shall be three internal tests conducted as per the schedule given below. The students have to attend all the three tests compulsorily.

- 1st test for 15 marks at the end of 5th week of the beginning of the Semester;
- 2nd test for 15 marks at the end of the 10th week of the beginning of the Semester; and
- 3rd test for 15 marks at the end of the 15th week of the beginning of the Semester.

7.5. The coverage of syllabus for the said three tests shall be as under:

- For the 1st test syllabus shall be 1st unit of the course;
- For the 2nd test it shall be 2nd unit and 1st half of the 3rd unit;
- For the 3rd test the syllabus will be 2nd half of the 3rd unit and complete 4th unit.

7.6. Out of 3 tests, the highest marks scored in **two tests** are automatically considered while assessing the performance of the students.

7.7. The Semester End Examination for 50 marks shall be held during 18th and 19th week of the beginning of the semester and **the syllabus for the semester end examination shall be entire 4 units**.

7.8. The **duration of the internal test shall be 75 minutes and for semester end examination the duration shall be 3 hours.**

Summary of Continuous Assessment and Evaluation Schedule

Type of Assessment	Period	Syllabus	Marks	Activity
First Test	2nd half of 5th Week	1st Unit	15	Consolidation of 1st Unit
Allocation of Topics for Assignments	6th Week	First Unit and 1st half of second unit		Instructional process and Continuous Assessment
Submission of Assignments	7th Week	First Unit and 1st half of second unit	5	Instructional process and Continuous Assessment
Seminars	8th Week	First unit and 1st half of second unit	5	Instructional process and Continuous Assessment
Second Test	2nd half of 10th Week	Second unit and 1st half of third unit	15	Consolidation of 2nd and 3rd Unit
Allocation of Topic for 2nd Assignment	11th Week	2nd half of second unit and 3rd Unit		Instructional process and Continuous Assessment
Submission of Assignments	12th Week	2nd half of second unit and 3rd Unit	5	Instructional process and Continuous Assessment
Seminars	13th Week	2nd half of second unit and 3rd Unit	5	Instructional process and Continuous Assessment
Third Test	2nd half of 15th Week	Second half of third unit and complete 4th Unit	15	Consolidation of 2nd half of 3rd Unit and entire 4th Unit
Semester End Practical Examination	16th Week	Entire syllabus	50	Conduct of Semester - end Practical Exams
Preparation for Semester–End Exam	16th & 17th Week	Entire Syllabus		Revision and preparation for semester–end exam
Semester End Theory Examination	18th Week & 19th Week	Entire Syllabus	50	Evaluation and Tabulation
	End of 20th Week			Notification of Final Grades

Note: 1. *Examination and Evaluation shall take place concurrently and Final Grades shall be announced latest by 5 days after completion of the examination.*

2. *Practical examination wherever applicable shall be conducted after 3rd test and before semester end examination. The calendar of practical examination shall be decided by the respective School Boards and communicated well in advance to the Registrar (Evaluation) who will notify the same immediately*

8.0. Evaluation of Practicals and Minor Project / Major Project / Dissertation

8.1. The performance in the practice tasks / experiments shall be assessed on the basis of:

a) Knowledge of relevant processes;

b) Skills and operations involved;

c) Results / products including calculation and reporting.

8.2 The 50 marks meant for continuous assessment of the performance in carrying out practicals shall further be allocated as under:

i	Conduction of regular practical / experiments throughout the semester	20 marks
ii	Maintenance of lab records	10 marks
iii	Performance of mid-term test (to be conducted while conducting second test for theory courses); the performance assessments of the mid-term test includes performance in the conduction of experiment and write up about the experiment.	20 marks
	Total	**50 marks**

The 50 marks meant for Semester End (C3) Examination, shall be allocated as under:

i	Conduction of semester end practical examination	30 marks
ii	Write up about the experiment / practical conducted	10 marks
iii	Viva Voce	10 marks
	Total	**50 marks**

8.3. The duration for semester-end practical examination shall be decided by the concerned School Board.

8.4 Evaluation of Minor Project / Major Project / Dissertation:

Right from the initial stage of defining the problem, the candidate has to submit the progress reports periodically and also present his/her progress in the form of

seminars in addition to the regular discussion with the supervisor. At the end of the semester, the candidate has to submit final report of the project / dissertation, as the case may be, for final evaluation. The components of evaluation are as follows:

i	Periodic Progress and Progress Reports (25%)
ii	Results of Work and Draft Report (25%)
iii	Final Evaluation and Viva-Voce (50%). Evaluation of the report is for 30% and the Viva-Voce examination is for 20%.

9. Eligibility to Appear Semester - end Examination

Only those students who fulfil a minimum of 75% attendance in aggregate of all the courses including practical courses / field visits etc, as part of the course(s) shall be eligible to appear for Semester End examination.

10. Requirements to Pass the Semester and to Carry Forward the Failed Subjects / Courses:

10.1. Requirements to Pass a Course

A candidate's performance will be in terms of scores, and the sum of IA and Semester End examination will be for a maximum of 100 marks (i. e, 50 marks of internal assessment and 50 marks of semester end examination) and have to secure a minimum of 40% to declare pass in a given course. However, a candidate has to secure a minimum of 25% (12 marks) in Semester End which is compulsory.

10.2. Requirement to pass the semester:

To pass the semester, a candidate has to secure minimum of 40% marks in each subject / course of study prescribed in that semester.

10.3 Provision to Carry Forward the Failed Subjects / Courses:

A student who has failed in a given number of courses in odd and even semesters shall move to next semester of immediate succeeding year and final year of the study. However, he / she shall have to clear all courses of all semesters within the double duration, i. e., within six years of admission of the first semester failing which the student has to re-register to the entire program.

10.4 Re-Registration and Re-Admission:

a) In case a candidate's class attendance in aggregate of all courses in a semester is less than 75% or as stipulated by the University, such a candidate is considered as dropped the semester and is not allowed to appear for end semester examination and he / she shall have to seek re-admission to that semester during subsequent semester / year within a stipulated period.

b) In such a case where in a candidate drops all the courses in semester due to personal reasons, it is considered that the candidate has dropped the semester and he / she shall seek re-admission to such dropped semester.

11. Attendance Requirement:

11.1 All students must attend every lecture, tutorial and practical classes.

11.2 In case a student is on approved leave of absence (e g:- representing the university in sports, games or athletics, placement activities, NCC, NSS activities and such others) and / or any other such contingencies like medical emergencies, the attendance requirement shall be minimum of 75% of the classes taught.

11.3 Any student with less than 75% of attendance in aggregate of all the courses including practical courses / field visits etc, during a semester shall not be permitted to appear to the end semester examination and such student shall seek re-admission as provided above.

11.4 Teachers offering the courses will place the above details in the School Board meeting during the last week of the semester, before the commencement of examination, and subsequently a notification pertaining to the above will be brought out by the Director of the School before the commencement of examination. A copy of this notification shall also be sent to the office of the Registrar & Registrar (Evaluation).

12. Challenge Valuation

a. A student who desires to apply for challenge valuation shall obtain a photo copy of the answer script by paying the prescribed fee within 10 days after the announcement of the results. He / She can challenge the grade awarded to him/her by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 10
days after the announcement of the results. This challenge valuation is only for SEE.

b. The answer scripts for which challenge valuation is sought for shall be evaluated by the external examiner who has not involved in the first evaluation. The higher of two marks from first valuation and challenge valuation shall be the final.

13. Grade Card and Grade Point:

a. **Provisional Grade Card**: The tentative / provisional Grade Card will be issued by the Registrar (Evaluation) at the end of every semester indicating the courses completed successfully. The provisional grade card provides **Semester Grade**

Point Average (SGPA).

b. Final Grade Card: Upon successful completion of BBA (Honors) Degree a Final Grade card consisting of grades of all courses successfully completed by the candidate will be issued by the Registrar (Evaluation).

c. **The Grade and the Grade Point:** The Grade and the Grade Point earned by the candidate in the subject will be as given below:

Marks P	Grade G	Grade Point (GP=V x G)	Letter Grade
90>100	10	v*10	O
80>90	9	v*9	A+
70 > 80	8	v*8	A
60> 70	7	v*7	B+
55 > 60	6	v*6	B
50 > 55	5.5	V*5.5	C
40> 50	5	v*5	P
0-40	0	v*0	F
ABSENT			AB

O - Outstanding; A-Excellent; B-Very Good; C-Good; D-Fair; E-Satisfactory; F - Fail

Here, P is the percentage of marks (P=[(IA)+M] secured by a candidate in a course which is **rounded to nearest integer**. V is the credit value of the course. G is the grade and GP is the grade point.

i. Computation of SGPA and CGPA

The Following procedure to compute the Semester Grade Point Average (SGPA)

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student in a given semester, i.e :
SGPA (Si) = ∑(Ci x Gi) / ∑Ci
where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

Illustration for Computation of SGPA and CGPA

Illustration No. 1

Course	Credit	Grade Point	Grade letter	Credit Point (Credit x Grade point)

Course 1	**4**	**8**	**A**	**4X8=32**
Course 2	**4**	**7**	**B+**	**4X7=28**
Course 3	**3**	**9**	**A+**	**3X9=27**
Course 4	**3**	**7**	**B+**	**3X7=21**
Course 5	**3**	**6**	**B**	**3X6=18**
Course 6	**3**	**5**	**P**	**3X5=15**
Course 7	**2**	**7**	**B+**	**2X7=14**
Course 8	**2**	**8**	**A**	**2X8=16**
	24			**171**

Thus, **SGPA = 171 ÷ 24 = 7.13**

Illustration No. 2

Course	**Grade Point**	**Grade letter**	**Credit**	**Credit Point (Credit x Grade)**
Course 1	**9**	**A+**	**4**	**4X9=36**
Course 2	**8**	**A**	**4**	**4X8=32**
Course 3	**7**	**B+**	**3**	**3X7=21**
Course 4	**10**	**O**	**3**	**3X10=30**
Course 5	**5**	**C**	**3**	**3X5=15**
Course 6	**6**	**B**	**3**	**3X6=18**
Course 7	**10**	**O**	**2**	**2X10=20**
Course 8	**8**	**A**	**2**	**2X8=16**
			24	**188**

Thus, **SGPA = 188 ÷ 24 = 7.83**

Illustration No.3

Course	**Credit**	**Grade Point**	**Grade Letter**	**Credit Point (Credit x Grade point)**
Course 1	4	10	O	4 x 10 = 40
Course 2	4	9	A+	4 x 9 = 36
Course 3	3	7	B+	3 x 7 = 21
Course 4	3	8	A	3 x 8 = 24
Course 5	3	9	A+	3 x 9 = 27
Course 6	3	9	A+	3 x 9 = 27
Course 7	4	10	O	4 x 10 = 40
	24			215

Thus**, SGPA = 215 ÷ 24 = 8.99**

ii. Cumulative Grade Point Average (CGPA):

Overall Cumulative Grade Point Average (CGPA) of a candidate after successful completion of the required number of credits (144) for BBA (150 for

BBA (Honors) degree is calculated taking into account all the courses undergone by a student over all the semesters of a program i. e.,

CGPA = ∑(Ci x Si) / ∑Ci

Where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration:

CGPA after Final Semester

Semester (ith)	No. of Credits (Ci)	SGPA (Si)	Credits x SGPA (Ci X Si)
1	24	6.83	24 x 6.83 = 163.92
2	24	7.13	24 x 7.13 = 171.12
3	24	7.83	24 x 7.83 = 187.92
4	24	8.99	24 x 8.99= 215.76
5	24	8.68	24 x 8.68 = 208.32
6	24	9.20	24 x 9.20 = 220.80
Cumulative	144		1167.84

Thus, **CGPA** = $\frac{24x6.83+24x7.13+24x7.83+24x8.99+24x8.68+24x9.20}{144}$ = 8.11

CONVERSION OF GRADES INTO PERCENTAGE:
Conversion formula for the conversion of CGPA into Percentage is:
Percentage of marks scored = CGPA Earned x 10
Illustration: CGPA Earned 8.11 x 10 = 81.10

14. Classification of Results

The final grade point (FGP) to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

CGPA	Grade (Numerical Index) G	Letter Grade	Performance	FGP Qualitative Index
9 >= CGPA 10	10	O	Outstanding	Distinction
8 >= CGPA < 9	9	A+	Excellent	
7 >= CGPA < 8	8	A	Very Good	First Class
6 >= CGPA < 7	7	B+	Good	

5.5> = CGPA < 6	6	B	Above average	Second Class
> 5 CGPA < 5.5	5.5	C	Average	
> 4 CGPA <5	5	P	Pass	Satisfactory
CGPA <4	-	F	Fail	-

Overall percentage=10*CGPA

15. Provision for Appeal

If a candidate is not satisfied with the evaluation of C1 and C2 components, he/she can approach the grievance cell with the written submission together with all facts, the assignments, test papers etc, which were evaluated. He/she can do so before the commencement of semester-end examination. The grievance cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if his/her

submission is found to be baseless and unduly motivated. This cell may recommend taking disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the grievance cell is final.

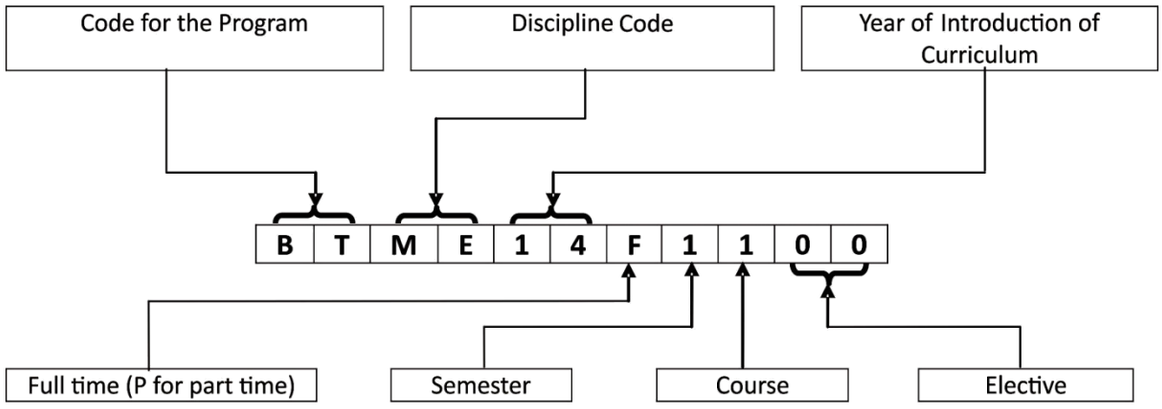
For every program there will be one grievance cell. The composition of the grievance cell is as follows:-

- The Registrar (Evaluation) - Ex-officio Chairman / Convener
- One Senior Faculty Member (other than those concerned with the evaluation of the course concerned) drawn from the school / department/discipline and/or from the sister schools / departments/sister disciplines – Member.
- One Senior Faculty Members / Subject Experts drawn from outside the University school / department – Member.

16. With regard to any specific case of ambiguity and unsolved problem, the decision of the

Vice-Chancellor shall be final.

Course Numbering Scheme



List of Codes for Programs and Disciplines / Branch of Study

Program Code	Title of the Program	Discipline Code	Name of the Discipline / Branch of Study
BA	Bachelor of Arts	AE	Advanced Embedded Systems
BB	BBA (Bachelor of Business Administration)	AI	Advanced Information Technology
BC	B.Com (Bachelor of Commerce)	AP	Advanced Power Electronics
BR	B. Arch (Bachelor of Architecture)	CA	Computer Aided Structural Engineering
BS	B Sc, BS (Bachelor of Science)	CE	Civil Engineering
BT	B.Tech (Bachelor of Technology)	CH	Chemistry
BP	Bachelor of Computer Applications	CO	Commerce
BL	LLB (Bachelor of Law)	CS	Computer Science and
MA	Master of Arts	DE	Data Engineering and Cloud
MB	MBA (Master of Business Administration)	EC	Electronics and Communication Engineering
MC	M.Com (Master of Commerce)	EN	English
MS	M.Sc / MS (Master of Science)	MD	Machine Design and Dynamics
MT	M Tech (Master of	ME	Mechanical Engineering
MC	Master of Computer Applications	EE	Electrical & Electronics Engineering

BBA – INDUSTRY INTEGRATED

Scheme of Instruction **Duration: 6 Semesters (3 Years)**

Sl. No	Course Code	Title of the Course	HC/ SC SE/ CC	Credit Pattern				Contact Hrs
				L	T	P	Total	
FIRST SEMESTER								
1	**BBAD**15F1100	Language – I, Communicative English – I	CC	2	1	0	3	4
2	**BBAD**15F1200	Language – II K / H / AE	CC	2	1	0	3	4
3	**BBAD**15F1300	Accounting – I	HC	3	0	1	4	5
4	**BBAD**15F1400	Manufacturing Management	HC	2	1	0	3	4
5	**BBAD**15F1500	Introduction to Management	HC	3	1	0	4	5
6	**BBAD**15F1600	Business Statistics	HC	3	0	1	4	5
7.	**BBAD**15F1700	Fundamentals of Computers	FC	2	0	1	3	4
Total Credits				18	3	3	**24**	**31**
SECOND SEMESTER								
1	**BBAD**15F2100	Language – I, Communicative English – II	CC	2	1	0	3	4
2	**BBAD**15F2200	Language – IIK / H / AE	CC	2	1	0	3	4
3	**BBAD**15F2300	Accounting – II	HC	3	0	1	4	5
4	**BBAD**15F2400	Organization Behaviour	HC	3	1	0	4	5
5	**BBAD**15F2500	Managerial Economics	HC	3	1	0	4	5
6	**BBAD**15F2600	Environmental Science	FC	1	1	0	2	3
Total Credits				14	5	1	**20**	**26**
THIRD SEMESTER								
1	**BBAD**15F3100	Business communication	CC	2	1	0	3	4
2	**BBAD**15F3200	Quantitative Methods	HC	3	0	1	4	5
3	**BBAD**15F3300	Financial Management	HC	3	0	1	4	5
4	**BBAD**15F3400	Business law	HC	2	1	0	3	4
5	**BBAD**15F3500	Career Planning and Development	OE	3	1	0	4	5
6	**BBAD**15F3600	Marketing Management	HC	3	1	0	4	5
7	**BBAD**15F3700	Indian Constitution & human rights	FC	2	1	0	3	4
Total Credits				18	5	2	**25**	**32**
FOURTH SEMESTER								
.								
1	**BBAD**15F4100	Human Resource Management	HC	3	1	0	4	5
2	**BBAD**15F4200	Business Research Methods	HC	3	1	0	4	5
3	**BBAD**15F4300	Cost Accounting	HC	3	0	1	4	5
4	**BBAD**15F4400	Service Management	HC	3	1	0	4	5
5	**BBAD**15F4500	Organization Study – Minor Project	HC	0	0	4	4	8

		Total Credits						
Specialization (Soft Core Courses (SC); Students shall choose any ONE of the Following specialization **I. Marketing**								
II. Finance								
III. HRM								
I Marketing specialization #								
6	**BBAD**15F4M10	Product and Brand Management	SC	2	1	0	3	4
7	**BBAD**15F4M20	Consumer Behavior	SC	2	1	0	3	4
II. Finance Specialization #								
6	**BBAD**15F4F10	Financial Markets and Services	SC	2	1	0	3	4
7	**BBAD**15F4F20	Exim & Forex Management	SC	2	1	0	3	4
III HRM Specialization #								
6	**BBAD**15F4H10	Knowledge Management	SC	2	1	0	3	4
7	**BBAD**15F4H20	Employee Relationship Management	SC	2	1	0	3	4
Total Credits				**16**	**5**	**5**	**26**	**36**
FIFTH SEMESTER								
1	**BBAD**15F5100	International Business	HC	3	1	0	4	5
2	**BBAD**15F5200	Entrepreneurship Development	HC	3	1	0	4	5
3	**BBAD**15F5300	Income Tax	HC	3	0	1	4	5
4	**BBAD**15F5400	Indian Economy	HC	3	1	0	4	5
5	**BBAD**15F5500	Management Accounting	HC	3	1	0	4	5
		Total Credits		**19**	**5**	**2**	**26**	**33**
Specialization (Soft Core Courses (SC)); Student shall choose specialization chosen in the IV semester								
I. Marketing								
II. Finance								
III. HRM								
I. Marketing specialization #								
6	**BBAD**15F5M30	Advertising	SC	2	1	0	3	**4**
7	**BBAD**15F5M40	Retail Management	SC	2	1	0	3	**4**
II. Finance Specialization #								
6	**BBAD**15F5F30	International Financial Management	SC	2	0	1	3	**4**

7	**BBAD**15F5F40	Investment & Portfolio Management	SC	2	1	0	3	**4**
III	**HRM Specialization #**							
6	**BBAD**15F5H30	International Human Resources Management	SC	2	1	0	3	4
7	**BBAD**15F5H40	Performance and Compensation Management	SC	2	1	0	3	**4**
Total Credits				**19**	**5**	**2**	**26**	**33**
SIXTH SEMESTER								
1	**BBAD**15F6100	Strategic Management	HC	3	1	0	4	5
2	**BBAD**15F6200	Business Ethics& Corporate Governance	HC	3	1	0	4	5
4	**BBAD**15F6300	Final Dissertation Project	HC	1	2	12	15	24
Total Credits				**7**	**4**	**12**	**23**	**34**

SEMESTER WISE SUMMARY OF CREDIT DISTRIBUTION

Semesters	No. of Credits
First Semester	**24**
Second Semester	**20**
Third Semester	**25**
Fourth Semester	**26**
Fifth Semester	**26**
Sixth Semester	**23**
Total Credits	**144**

FIRST SEMESTER

Course Code	Duration	Course Title	L	T	P	C
BBAD15F1100	**16 Weeks**	**LANGUAGE-I, COMMUNICATIVE ENGLISH**	**2**	**1**	**0**	**3**

OBJECTIVES:

- To attune young minds to concerns and issues which have a broad and wide scope of use and application to life.
- To acquire the functional use of language in context
- To understand the issues of ecology and environment
- To explore and critique issues related to sports and media
- To inculcate the habit of reading and writing leading to effective and efficient communication.

OUTCOMES:

Learners should be able to

- Demonstrate ethical and political responsibilities in taking cognizance of issues relating to society , environment and media.
- Practice the process oriented approach to writing
- write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide

Vocabulary range, organizing their ideas logically on a topic.

- To use the target language effectively focusing on interpersonal skills and develop good command over the language..

Unit – 1 :- Tears from the Earth-Duane Marchand, The End of Living and Beginning of Survival-Chief Seatle, Moschus Moschiferus -A.D. Hope, Remedial grammar - Use of Articles, Prepositions and Concord in context

Unit – 2 :-Symbiotic Bond-Mari and Stan Thekaekara [An excerpt from the Sunday magazine- The Hindu] ,Tiger in the Tunnel –Ruskin Bond,Violence and the Media – Karensrutledge, Reading comprehension[Skimming and scanning a passage for specific information]

Unit – 3 :-On Film Making: An Introduction to the craft of the Director, Onscreen Magic-Avijit Pathak My greatest Olympic Prize-Jesse Owens, Paragraph writing[Descriptive, Narrative and persuasive paragraphs]

Unit - 4

Extract from Edmund Hillary and Tenzing Norgay's Biography, The Sporting Spirit-George Orwell [An extract: Tribune, London .December 1945, Home Coming Of the Heroes (An excerpt from Goal: An Autobiography by Major Dhyan Chand), Listening and Speaking Skills(Introducing oneself and others ;Giving and taking directions)

Reference Books:

- Murphy,Raymond.(1998), Intermediate English Grammar,New York
- Mudambadithaya G.S.,(2002) English Grammar and composition
- Digne, Flinders and Sweeney(2010) Cambridge University press
- Lupton, Mary Jane (1998).
- Ur, Penny .(2002),Grammar Practice Activities, OUP
- Joan Van Emden and Lucinda Becker Palgrave.Effective Communication for Arts and Humanities students.
- Glendenning, Eric H. and Beverly Holmstrom (2008), Study Reading: A Course in Reading Skills for Academic Purposes, New Delhi: CUP.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F1200	**16 Weeks**	**LANGUAGE-II, K / H / AE / S**	**2**	**1**	**0**	**3**

Course Objective: To improve language proficiency in respective language and learn grammar for critical and proper communication.

ADDITIONAL ENGLISH

OBJECTIVES:

- To attune young minds to concerns and issues which have a broad and wide scope of use and application to life.
- To acquire the functional use of language in context
- To understand the issues of love ,marriage and life
- To explore and critique issues related to education and travel.
- To inculcate the habit of reading and writing leading to effective and efficient communication.

OUTCOMES:

Learners should be able to

- Demonstrate ethical responsibilities in taking cognizance of issues relating to love and marriage , life and travel.
- write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide

Vocabulary range, organizing their ideas logically on a topic.

- To use appropriate communicative strategies.

Unit - 1

Love vs Arranged: PyarKiya To Darna Kya-Shobhaa De,Poor Girl-Maya Angelou,The Winner Takes it All-Benny Anderson and Bjorn Ulvaeus, Correction of common grammatical errors in sentences

Unit – 2

I Only Came To Use the Phone-Gabriel Garcia Marquez, Sonnet CXXX-William Shakespeare,The Lover-Harriet Jacobs,Writing Slogans on Various Issues[Creative writing].

Unit –3

In SahyadriHills , A Lesson in Humility- Sudha Murthy, Abraham Lincoln's Letter To His Son's ,Teacher-Abraham Lincoln,My Young Son Asked Me- Bertolt Brecht, Africa-Maya Angelou,
Reading Comprehension[Skimming And Scanning for specific Information]

Unit- 4

The Exercise Book –Rabindranath Tagore, The Tourists are Coming –Art Buchwald, America –Maya Angelou,Chicago-Carl Sandburg

Reference Books:

NandiniNayar ,Footprints 1,An Anthology of prose ,poetry and Fiction ,published by Cambridge University ,New Delhi.

Hindi

बी.बी.ए पाठ्यक्रम – प्रथम सेमिस्टर IBBA / IBBA(Hons.)

(For the academic year 2017-18, 18-19 and 19-20)

इकाई – 1

1.कहानी - तावान – प्रेमचंद

2.कहानी – बारिश की रात – मिथिलेश्वर

3.संस्मरण - चीनी भाई - महादेवी वर्मा

इकाई – 2

4.कहानी - वापसी - उषा प्रियंवदा

5.कहानी – भेड़े और भेडियें - हरिशंकर परसाई

6.रेखाचित्र - बुधिया कब आयेगा- ज्ञानचंद मर्मज्ञ

इकाई – 3

7.कहानी - कैलक्युलेशन – मालती जोशी

8.कहानी – एक दिन का मेहमान- निर्मल वर्मा

9.निबन्ध - एक दीक्षांत भाषण – रवीन्द्र नाथ त्यागी

इकाई – 4

पत्र-लेखन : पूछ-ताछ पत्र, आदेश पत्र, भुगतान पत्र |

अनुवाद : अनुछेद और पारिभाषिक शब्दावली (अंग्रेजी से हिन्दी)

सूचना : प्रत्येक इकाई 25 अंक केलिए निर्धारित है |

RU/BOS/A&H-HIN/UG/MAR 2017

Course Code	Duration	Course Title	L	T	P	C
BBAD15F1300	**16 Weeks**	**ACCOUNTING- I**	**3**	**0**	**1**	**4**

Objective: This course aims to familiarize the students with the application of the basic Accounting knowledge and preparation of final accounts.

Course Contents:

UNIT-1: FUNDAMENTAL OF ACCOUNTS:

Meaning and scope of accounting – Users of accounting information-–Accounting concepts and conventions-principles of accounts - Methods of Book keeping**- Single Entry System:** Meaning – Difference between single entry and double entry – (Theory) Journal entries-Ledger posting

UNIT-2: SUBSIDIARY BOOKS:

Meaning- Purchase book- Sales book- Purchase returns book- Sales returns book,- Receivable & Payable books- Trail balance (Theory and Problems)- **Cash Book-** - Petty Cash Book- Single column cash book- Double column cash book- Three column cash book (Theory and Problems)- Journal proper.

UNIT-3: FINAL ACCOUNTS OF SOLE PROPRIETORSHIP & PARTNERSHIP ACCOUNTS:-

Preparation of final accounts (Trading account– Profit and Loss account -Balance sheet) with adjustments (Theory and Problems)- Meaning and definition of partnership – Features –Partnership Deed (meaning) – Contents of partnership deed- Legal provisions in the absence of the partnership Deed- Profit and Loss appropriation account- Fixed and fluctuating capital methods – (Theory and Problems)

UNIT-4: COMPANY ACCOUNTS:

Meaning and characteristics of company - Different types of shares – Journal entries for Issue of shares at par- premium and discount- forfeiture- Reissue (Theory and Problems)

Skill development activities:

1. Visit any sole proprietorship or partnership business concern and understand practical procedure of recording of business transactions.

2. Collect the financial statements of a sole proprietorship or partnership business concern.

3. Collect the information regarding types of shares issued by any four joint stock

companies.

Reference Books:

1. Battacharya S.K., John Dearden, Accounting for Management; Vikas Publishing House Ltd., New Delhi.
2. Jain and Narang; Advanced Accountancy, Kalyani Publishers, New Delhi.
3. Maheswari S.N, Financial Accounting, Vikas Publishing House, New Delhi.
4. Maheswari S.N., Corporate Financial Accounting. Vikas Publishing House, New Delhi.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F1400	16 Weeks	MANUFACTURING MANAGEMENT	2	1	0	3

Objective: To familiarize students with key production and operation activities and enable to integrate this knowledge in actual business environment.

Course content:-

UNIT-1 : INTRODUCTION:

Production & Operation Management – Meaning - need and scope - objectives – need- limitations- Automation- advantages and disadvantages of automation.

UNIT-2: PLANT LOCATION AND LAYOUT:

Factor affecting location-Theory and practices-Cost factor in location- Plant layout-principles of plant layout – Space requirement - Organization of physical facilities - Building – Sanitation - Lighting - Air conditioning – Safety.

UNIT-3: MATERIALS MANAGEMENT & QUALITY CONTROL:

Purchasing - Selection of suppliers -Inventory management - Material handling principles and practices - Economic consideration - Criteria for selection of materials handling equipment – Standardization – Codifications - Simplification - Inventory control -Value Analysis - Value engineering and Ergonomics - Inter- relationship of plant layout and materials handling. Quality control- meaning- techniques.

UNIT-4: PRODUCTION PLANNING AND CONTROL:

Production planning- Objectives - concepts-Capacity planning-corresponding production planning – Controlling -Scheduling routing.

Maintenance and Waste Management: Types of maintenance break down - Spares planning and control -Preventive routine -Relative advantages -Maintenance scheduling -Equipment reliability and modern scientific maintenance methods **-** Scrap and surplus disposal -Salvage and recovery.

Skill Development Activities:

1. Visit any industry and list out the stages of PPC with as many details as possible.
2. List out the Functions of Materials management in an organization
3. Describe the Functions of Quality Circles in an industry
4. Draw a ISO specification chart

5. Visit a company and List out Environmental issues.
6. Visit a company and draw a chart on Plant layout.

Reference Books:

1. Chary, SN, Production & Operations Management.
2. Ashwathappa. K. Production & Operations Management.
3. Alan Muhlemann John Oaclank and Keith Lockyn,
4. Ahuja KK, Production Management.
5. Everett E Adam Jr., and Ronald J Ebert, Production & Operations Management.
6. Agarwal L. N. and Jain K.C., Production Management.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F1500	16 Weeks	INTRODUCTION TO MANAGEMENT	3	1	0	4

Objective: The course familiarizes the students with the principles of management, Managerial practices and recent trends in management.

Course Content:

UNIT-1: CONCEPT OF MANAGEMENT:-

Meaning - nature - Scope and importance of management - Management as profession - management as science or an Art- MBO- MBE-Theories of management.

UNIT-2: PLANNING:-

Meaning and significance –Types of plans–Different approaches to plans strategies - Objectives and policies.

UNIT-3: ORGANIZING & STAFFING:-

Meaning - Principles of organizing staffing - Types of organization-Formal and informal organization structure - Delegation Authority and responsibility - Span of control and chain of command.

UNIT-4: DIRECTING AND CONTROLLING:

Definition – Importance - Principles of direction - Co-ordination as essence of management. Leadership – types of leadership- principles - contemporary leadership styles.

Managerial Control :- Meaning - Need for control - features of effective controlling system- Emerging trends in management.

Skill Development Activities:

1. Collect the photograph and Bio-data of any three contributors to management thought.
2. Draft organizational chart and discuss the authority relationship.
3. Identify the feedback control system of an organization.
4. List out your strengths and weak nesses

5.Collect the names of BPO's and KPO's
6.Visit a factory/industry and collect information from workers about the stress and their causes.

Reference Books:

1. Parasad L.M, Principles & practice of management,Sultan Chand & Sons, New Delhi.
2. Gupta CB, Principles of management, Sultan Chand & Sons, New Delhi.
3. ChandanJ. S, Management: Concept and Strategies,Vikas Publishing.
4. Sherleker, Principles of Management, Himalaya Publishing House, New Delhi.
5. Ramana AT,Knowledge Management, Tata McGraw Hill,New Delhi.
6. Horold Koontz and IteinzWeibrich, Essential of Management,
7. AswathapaK, Essential of Business Administration, Himalaya Publishing House.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F1600	**16 Weeks**	**BUSINESS STATISTICS**	**3**	**0**	**1**	**4**

Objective: The objective of this course is to familiarize students with the basic statistical tools used to summarize and analyze quantitative information for decision making.

Course content:

UNIT-1: INTRODUCTION TO STATISTICS:

Meaning and Definition – Function – Scope – Limitations - Organization of Data - Collection of data (census and sample techniques) of data- Classification – Tabulation of data.

Diagrams and graphs*:* - Simple bar diagram – multiple - and percentage - component bar diagram - pie chart and frequency polygon.

UNIT-2: MEASURES OF CENTRAL TENDENCY:

Meaning and definition – Types of averages – Arithmetic Mean (Simple and Weighted), Median – Mode & Graphical representation of Median and Mode

UNIT-3: MEASURES OF DISPERSION:

Meaning and Definition –Range – Quartile Deviation – Mean Deviation – Standard deviation and Co-efficient of Variation.

Skewness:- Meaning - uses and problems on Karl Pearson's co-efficient of skewness.

UNIT - 4: INDEX NUMBERS:

Meaning and Definition – uses – methods of constructing Index numbers- Simple aggregative method – Simple Average of Price Relative method – Weighted Index

Method- Fishers Ideal method (including TRT and FRT) **–** Consumer Price Index – problems.

Skill Development Activities:

1. Collect marks scored by 50 students in a examination and prepare frequency distribution table.
2. Collect data relating to prices of shares of two companies for ten days and ascertain which companies share price is more stable.
3. Collect the run scored by the two batsmen in ten one day international cricket matches, find who is better run getter and who is more consistent.
4. Using imaginary figures construct the cost of living index of your own place.

Reference Books:

1. Vohra, N.D., Business Statistics, McGraw Hill Publishing Co.
2. Sharma, J.K., Business Statistics, Pearson Education, New Delhi.
3. Levine Krehbeil, Berenson and Viswanathan, Business Statistics: A first course, Prentice –Hall of India, New Delhi.
4. Thukral, J.K., Mathematics for Business Studies, Mayur Publications.
5. Gupta S.P., Statistical Methods. Sultan Chand & Sons, New Delhi.
6. Elhance D.N, Fundamentals of Statistics.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F1700	16 Weeks	FUNDAMENTALS OF COMPUTERS	2	0	1	3

Course Objective: To provide basic knowledge of computer and its usage.

UNIT-1 :- INTRODUCTION TO COMPUTERS:

General features of a computers – Generation computers - Personal computer – Workstation– Mainframe computer and super computers. Computer applications – Data processing –Information processing – Commercial – Office automation – Industry and engineering –Healthcare – Education – Graphics and multimedia.

UNIT-2 :- COMPUTER ORGANIZATION:

Central processing unit – Computer memory – Primary memory – Secondary memory – Secondary storage devices – Magnetic and optical media – Input and output units – OMR – OCR – MICR – Scanner – Mouse - Modem.

UNIT-3 :- COMPUTER HARDWARE AND SOFTWARE:

Machine language and high level language – Application software – Computer program – Operating system – Computer virus - antivirus and computer security – Elements of MS DOS and Windows OS – Computer arithmetic – Binary - Octal and hexadecimal number systems – Algorithm and flowcharts – Illustrations – Elements of database and its applications.

UNIT-4 :- MICROSOFT OFFICE:

Word processing and electronic spread sheet – An overview of MS WORD - MS EXCEL and MS POWER POINT – Elements of BASIC programming – Simple illustrations.

Computer Networks: Types of networks – LAN - Intranet and internet – Internet applications – World wide web – E-mail - Browsing and searching – Search engines – Multimedia applications.

Reference Books:

1) Alexis Leon and Mathews Leon (1999), Fundamentals of information technology, Leon
   Techworld Publications.
2) Jain, S.K. (1999), Information Technology "O" level made simple, BPB Publications.
3) Jain, V.K. (2000), "O" Level Personal Computer Software, BPB Publications.
4) Sharma Dhiraj, Information Technology for Business Himalaya Publishing House.
5) Archanakumar, Computer Basics with Office automation I.K. International
6) Rajaraman, V. (1999), Fundamentals of Computers, Prentice Hall India.
7) Hamacher, Computer Organization, McGraw-Hill Publications.
   BharihokeD., Fundamental of Information Technology.

SECOND SEMESTER

Course Code	Duration	Course Title	L	T	P	C
BBAD15F2100	**16 Weeks**	**LANGUAGE-I, COMMUNICATIVE ENGLISH – II**	**2**	**1**	**0**	**3**

OBJECTIVES:

- To attune young minds to concerns and issues which have a broad and wide scope of use and application to life.
- To acquire a functional use of language in context
- To understand issues of ecology and environment
- To explore and critique issues related to sports and media
- To inculcate the habit of reading and writing leading to effective and efficient communication.

OUTCOMES:

Learners should be able to

- Demonstrate ethical and political responsibilities in taking cognizance of issues relating to society , environment and media.
- Practice a process oriented approach to writing
- Write cohesively , coherently and flawlessly avoiding grammatical errors, using a wide range of

  vocabulary, organizing their ideas logically on a topic.
- Use the target language effectively to focus on interpersonal skills and develop a good command over the language.

.**UNIT I**:- We Wear the Mask – Paul Laurence Dunbar, The Last Lesson – Alphonse Daudet, Direct Indirect Speech

UNIT II :- Ulysses – Alfred, Lord Tennyson, We are Not Afraid to Die.-Gordon Cook and Alan East, Paragraph Writing

UNIT III :- The War Prayer – Mark Twain, Hiroshima – Agyeya (Tr. Leonard Nathan), Reading Comprehension, Active Voice & Passive Voice

UNIT IV :- The Journey of the Magi – T.S. Eliot, The War – Luigi Pirandello, Question Tags, Media Transfer (Telephone message)

Reference Books:

1. Murphy,Raymond. (1998), Intermediate English Grammar,New York
2. Raymond Murphy (2002) English Grammar and composition
3. Digne, Flinders and Sweeney(2010) Cambridge University press
4. Lupton, Mary Jane (1998).
5. Ur, Penny .(2002),Grammar Practice Activities, OUP
6. Joan Van Emden and Lucinda Becker Palgrave. Effective Communication for Arts and Humanities students.
7. Glendenning, Eric H. and Beverly Holmstrom (2008), Study Reading: A Course in Reading Skills for Academic Purposes, New Delhi: CUP.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F2200	16 Weeks	LANGUAGE-II, K / H / AE / S	2	1	0	3

Objective: To improve language proficiency in respective language and learn grammar for

critical and proper communication.

ADDITIONAL ENGLISH
OBJECTIVES:

- To attune young minds to concerns and issues which have a broad and wide scope of use and application to life.
- To acquire the functional use of language in context
- To understand the issues of love ,marriage and life
- To explore and critique issues related to education and travel.
- To inculcate the habit of reading and writing leading to effective and efficient communication.

OUTCOMES:

Learners should be able to

- Demonstrate ethical responsibilities in taking cognizance of issues relating to love and marriage, life and travel.
- write cohesively and coherently and flawlessly avoiding grammatical errors, using a wide

  Vocabulary range, organizing their ideas logically on a topic.
- To use appropriate communicative strategie.

Unit - 1 :- Idioms, Degree of Comparisons, A Horse and Two Goats, The Cow of the Barricades

Unit – 2 :- Prefix & Suffix, Synonyms, Mending Wall, A Wall is Just a Wall.

Unit –3 :- Design a leaflet, A Girl, To Mother , The Beauty Industry

Unit- 4 :- Compose an invitation ,A Ring to Me is Bondage,I am an Ordinary Man,Why I want a Wife .

Reference Books:

NandiniNayar ,Footprints 2,An Anthology of prose ,poetry and Fiction ,published by Cambridge University ,New Delhi

Hindi

बी.बी.ए - पाठ्यक्रम (द्वितीय सेमिस्टर) – II BBA / IIBBA(Hons.)

(For the academic year 2017-18, 18-19 and 19-20)

इकाई – 1

1.कबीर के दोहे

2.कविता – मैथलीशरण गुप्त

3.कविता – माखनलाल चतुर्वेदी

इकाई – 2

4.बिहारी के दोहे

5.कविता - रामधारी सिंह 'दिनकर'

6.कविता – हरिवंशराय 'बच्चन'

इकाई – 3

7.सूरदास के पद

8.कविता – अटल बिहारी वाजपाई

9.कविता – गोपालदास नीरज

इकाई – 4

हिन्दी में रोजगार की संभावनाएँ

अनुवाद (पारिभाषिक शब्दावली) और अनुछेद (हिन्दी से अंग्रेज़ी में)

सूचना : प्रत्येक इकाई 25 अंक केलिए निर्धारित है |

RU/BOS/A&H-HIN/UG/MAR 2017

Course Code	Duration	Course Title	L	T	P	C
BBAD15F23	16 Weeks	ACCOUNTING – II	3	0	1	4

Objective:

This course aims to provide knowledge in accounting to the students on essential aspects in various business organizations.

Course content:

UNIT- 1: FIRE INSURANCE CLAIMS

Introduction - loss of stock - steps for ascertaining fire insurance claims - treatment of salvage - average clause - treatment of abnormal loss - computation of fire insurance claims. (Theory and Problems)

UNIT -2: COMPANY FINAL ACCOUNTS:

Final accounts of company as per schedule VI of companies Act 1956 - Trading account -Profit and loss account - Profit and Loss appropriation account - Balance sheet with adjustments. (Theory and Problems)

UNIT- 3: HIRE PURCHASE AND INSTALLMENT SYSTEM:

Introduction – meaning - Hire purchase agreement - calculation of Hire purchase price, interest - Journal entries and ledger accounts in the books of hire purchaser and hire vendor (asset accrual method only) - installment system-meaning – features - journal and ledger in the books of installment purchaser and installment vendor under interest suspense method. (Theory and Problems)

UNIT -4: BANKING COMPANY

Final accounts under vertical format (Profit and loss account and Balance sheet) with adjustments. (Theory and Problems)

Skill Development activities:

1. Visit the general insurance company and collect the proposal form for fire insurance claims.
2. Collect the financial statements of any joint stock company
3. Draft a Hire purchase agreement/ installment purchase agreement with imaginary figures
4. Visit the nearest bank and collect the accounting statements

Reference Books:

1. Dr.Anil Kumar, Dr. Rajesh Kumar and Dr.B. Mariyappa, Financial accounting, Himalaya Publishing house.
2. B.S.Raman, Financial accounting, United Publishers.
3. S.P.Jain and K.L.Narang, Financial Accounting, Kalyani Publishers.
4. Mahaeshwari S.N. Financial accounting, Vikas Publishing House
5. Tulasian.P.c. Introduction to Accounting, Pearson Education.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F2400	16 Weeks	ORGANISATION BEHAVIOUR	3	1	0	4

Objective: The course familiarizes the students with the business organization and Management and Managerial Practices.

Course Content:

UNIT- 1: INTRODUCTION

Meaning - need and importance of organization – classification of organization - prospectus of formal organization - Organizational Behaviour – Nature and Scope – contribution from other discipline.

UNIT -2: PERSONALITY & LEARNING

Definition - Determinants of personality - Theories of personality – Erickson's personality - Freudian theory and Trait theory - Meaning of learning – Learning process – Learning theory of Organizational Behaviour – Classical - Operant conditioning- Cognitive- Observation Theory

UNIT -3: ATTITUDE & PERCEPTION

Meaning – Characteristics - Components and Formation of attitudes - Change in attitude - Barriers to change- How to minimize the barriers.

Perception:- Meaning and definition – Need - Factors influencing perception - perceptual consistency - Context and definition - Interpersonal perception.

UNIT-4: GROUP BEHAVIOR AND GROUP DYNAMICS

Meaning – Types – Groups in the organization – Group size and status – Influences –Roles and relationship and group behavior – Characteristics – Behavior problem - Group norms – Cohesiveness - feature Effects – Group thinking – Symptoms - Influence and Remedy – Group decision making techniques.

Reference Books:

1. Essential Reading Singh, K. (2012). Organizational Behaviour: Text and Case. New Dehli: Pearson Education.

2. Aswathappa, K. (2010). Organizational Behaviour(Text, Cases and Games). Bangalore: Himalaya Publication.

3. Greenberg, J., & Baron, R. A. (2008). Behaviour in Organizations. Pearson Prentice Hall. Nelson, D. L., & Quik, J. C. (2008).

4. Organization Behaviour. Thomson South Western. Robbins, S. P., Judge, T. A., & Vohra, N. (2011).

Course Code	Duration	Course Title	L	T	P	C
BBAD15F2500	**16 Weeks**	**MANAGERIAL ECONOMICS**	**3**	**1**	**0**	**4**

Objectives: To provide clear relationship between knowledge of economic application in

management decision making.

Course Content:

UNIT-1 : NATURE AND SCOPE OF MANAGERIAL ECONOMICS:

Meaning - Definition - Characteristics - Scope and subject matter relationship with

other discipline.

UNIT-2 : DEMAND AND SUPPLY:

Meaning and definitions-long run and short run demand forecasting – Objectives and need for demand forecasting - Methods of demand forecasting – Least square method problems on least square method forecasting- Demand for new product - Criteria of good forecasting methods.

UNIT-3 : PRODUCTION ANALYSIS:

Concept of production function – Cost– Meaning- Money Cost - Real Cost - Opportunity cost -Implicit and explicit cost -Short–run costs -Total cost - Fixed cost - Economies of scale. Revenue– Meaning– Total revenue - Average revenue and marginal revenue- Break even analysis- Break even chart with problems.

UNIT-4 : PRICING THEORY AND PRICING METHODS:

Perfect competition - Monopoly - Monopolistic and oligopoly - Meaning – Definition – Features - Price and output determination under different marketing conditions - Cost plus pricing - penetration and skimming pricing.

Skill Development Activities:

1. Write down the Incremental principles with a numerical illustration.
2. Write a note on Least square method and its application
3. Show the Calculation of cost & revenue.
4. Mention the method of Calculation of BEP (in units & Value)
5. You are required to write Calculation of cost plus price.
6. Write the system of Calculation of project profitability

Reference Books:

1. Joel Dean, Managerial Economics, Prentice Hall Ltd., India.
2. Varshiney & Maheswari, Managerial Economics, Sultan Chand & Co.
3. Mehatha P.L., Managerial Economics, Sultan Chand & Co.
4. Dwivedi D.N., Managerial Economics, Himalaya Publishing House.
5. Mote, Paul & Gupta, Managerial Economics, Tata Mc Graw Hill Ltd.
6. Mithani D M: Business Economics.
7. Petersen & Lewis: Managerial Economics.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F260	16 Weeks	ENVIRONMENTAL SCIENCE	2	0	0	2

Objective: To familiarize students with environmental issues as how to conserve, preserve our Environment.

Course Content:

UNIT-1: INTRODUCTION:

Multidisciplinary nature of environmental studies – Definition -Scope and importance -Need for public awareness. **Natural Resources:** Renewable and non-renewable - Problems associated - Forest resources - Water resources - Mineral resources - Food resources - Energy resources - Land resources and their conservation.

UNIT-2 : ENVIRONMENTAL POLLUTION:

Definition - Causes - Effects and control measures of air - Water – Soil – Marine – Noise -Thermal - Nuclear pollutions - Solid waste management - Prevention of pollution.

UNIT-3 : SOCIAL ISSUES AND THE ENVIRONMENT:

Unsustainable to sustainable development - Environmental ethics - Climate changes - global warming - Wildlife protection act - Public awareness.

UNIT-4 : HUMAN POPULATION AND THE ENVIRONMENT:

Population growth - Population explosion - Human rights - Value education - Role of information technology in environment and human health - HIV/Aids -Women and child welfare - Case studies.

Reference Books:

1. Desai R.G. - Environmental studies. Himalaya Pub. House.
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd.,
4. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi.
5. Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd.

III SEMESTER

Course Code	Duration	Course Title	L	T	P	C
BBAD15F3100	**16 weeks**	**BUSINESS COMMUNICATION**	**2**	**1**	**0**	**3**

Objectives:- The objective is to develop both oral and written communication skills relating to organization and Business issues:-

Course structure;-

UNIT 1:- INTRODUCTION:-

Meaning – Importance – objectives – types and forms of communication – achieving success through effective business communication – Interpersonal communication –

Communication in a world of Diversity - understanding the opportunities and challenges of communication in a world of diverse.

UNIT 2:- DESIGNIG AND DELIVERING ORAL AND ONLINE PRESENTATIONS

Importance of public speaking and speech compositions - principles of effective speaking and presentations - Technical speeches and Non-Technical presentations – Speech for introduction of a speaker – Speech for vote of thanks- occasional speech - Theme speech - Moderating programmes - use of technology.

UNIT 3:- INTERVIEWS AND MEETINGS:-

Importance of interviews - Art of conducting and giving interviews - Placement or job interview -writing application letters and other employment- understanding the interviewing process - follow up process. Opening and closing the meeting - participating and conducting group discussions - brain storming – e-meetings - preparing agenda and minutes of the meeting.

UNIT 4:-WRITING EMPLOYMENT MESSAGES AND INTERVIEWING FOR JOBS

Inquiries – circulars – quotations – orders - acknowledgements Executions – complaints - claims and adjustments - collection letter - banking correspondence - Agency correspondence Sales letters - Job application letters, - Bio-data - Interview letters - letter of reference – memo.

Reference Books:-

1. Courtland L. Bovee, John V. Thill, Abha Chatterjee - Business Communication Today, pearson
2. C.G.G Krishnamacharyulu & lalitha :- Soft skills of personality development, HPH.
3. Santosg Kumar – Soft skills for business

Course Code	Duration	Course Title	L	T	P	C
BBAD15F3200	**16 weeks**	**QUANTITATIVE METHODS**	**3**	**0**	**1**	**4**

Objectives:- The objective is to provide basic knowledge of quantitative methods and their

commercial application for decision making in business.

Course content:-

Unit 1: TIME SERIES

Introduction – Meaning –Uses- Components of Time Series- Fitting a straight line trend by the method of least squares and Computation of Trend Values (When ∑x=0) including Graphical presentation of trend values – Problems.

Unit 2: INTERPOLATION AND EXTRAPOLATION

Meaning – Significance – Assumptions – Methods of Interpolation – Binomial expansion (Interpolation method one and two missing values only) – Newton's Advancing Differences Method – Problems.

Unit 3: CORRELATION AND REGRESSION

Correlation:- Meaning & definition- uses, types, Karl Pearson's co-efficient of correlation, Probable error, Spearmen's rank correlation co-efficient.
Regression:- Meaning, definition, uses, Regression lines, equations, Correlation co-efficient through regression co-efficient

Unit 4: PROBABILITY AND SAMPLING

Meaning - objectives and Types - Probability Sampling and Non-Probability Sampling Techniques- Meaning of Population - Parameter and Statistic – Sampling Distribution – Meaning and usefulness of Standard Error (Simple Problems on calculation of Samples size)
THEORY OF PROBABILITY: Meaning and Importance of Probability – Experiment - Event and types of events - Addition Theory of probability. (Simple Problems on addition theorem only)

BOOKS FOR REFERENCE

1. S P Gupta: Statistical Methods- Sultan Chand, Delhi
2. C.R.Reddy : Quantitative Techniques for Management Decisions, HPH.
3. Dr. B N Gupta: Statistics (SahitytaBhavan), Agra.
4. R.S Bhardwaj: Business Statistics, Excel Books.
5. Chikodi&Pradad – Quantitative Method for Business - II
6. Veerchamy : Operation Research I.K. International Publishers
7. S C Gupta: Business Statistics, Himalaya Publications.
8. Ellahance : Statistical Methods
9. Sanchethi and Kapoor: Business Mathematics, Sultan Chand
10. C.S Mujawar : Statistics for Managers I.K. International Publishers
11. Dr. Alice Mani: Quantitative Methods for Business - II, SBH.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F3300	**16 weeks**	**FINANCIAL MANAGEMENT**	**3**	**0**	**1**	**4**

OBJECTIVE

The objective is to enable students to understand the basic concepts of Financial Management and the role of Financial Management in decision-making.

Course content:-

UNIT 1: INTRODUCTION TO FINANCIAL MANAGEMENT

Introduction – Meaning of Finance – Business Finance – Finance Function – Aims of Finance Function – Organization structure of finance - Financial Management – Goals of Financial Management – Financial Decisions – Role of a Financial Manager – Financial Planning – Steps in Financial Planning – Principles of a Sound Financial Planning.

UNIT 2: FINANCING DECISION AND INVESTMENT DECISION

Financing Decisions: Introduction – Meaning of Capital Structure – Factors influencing Capital Structure – Optimum Capital Structure – EBIT – EBT – EPS Analysis – Leverages – Types of Leverages – Simple Problems.

UNIT 3:INVESTMENT DECISIONS: Introduction – Meaning and Definition of Capital Budgeting – Features –Significance – Process – Techniques – Payback Period – Accounting Rate of Return – Net Present Value – Internal Rate of Return – Profitability Index - Simple Problems

Dividend Decision

Introduction – Meaning and Definition – Determinants of Dividend Policy – Types of Dividends .

UNIT 4: WORKING CAPITAL MANAGEMENT

Introduction – Concept of Working Capital – Significance of Adequate Working Capital – Evils of Excess or Inadequate Working Capital – Determinants of Working Capital – Sources of Working Capital – Cash Management.

BOOKS FOR REFERENCE

1. Reddy, Appananaih: Financial Management., HPH
2. Sudrashan Reddy – Financial Management, HPH.
3. Venkataraman R _ Financial Management, VBH.
4. S N Maheshwari, Financial Management., Sultan Chand.
5. R.M.Srivastava : Financial Management –Management and Policy, Himalaya Publishers.
6. Khan and Jain, Financial Management, Tata McGraw Hill.
7. Dr. K.V. Venkataramana, Financial Management, SHB Publications.
8. Sudhindra Bhatt: Financial Management, Excel Books.
9. Sharma and Sashi Gupta, Financial Management, Kalyani Publication.
10. M.GangadharRao& Others: Financial Management, Himalaya Publishers.
11. I M Pandey, Financial Management, Vika Publication House.
12. Prasanna Chandra, Financial Management, Tata McGraw Hill.
13. K. Venkataramana, Financial Management, SHBP.
14. Dr. Alice Mani: Financial Management, SBH.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F3400	**16 weeks**	**BUSINESS LAW**	**2**	**1**	**0**	**3**

OBJECTIVE

The objective is to introduce the students to various regulations affecting business and to familiarize the students with such regulations.

Course content:-

UNIT 1: INTRODUCTION TO BUSINESS LAWS

Introduction - Nature of Law - Meaning and Definition of Business Laws - Scope and Sources of Business Law - Fundamental Rights and Directive Principle of State Policies - Principles having economic significance - Overview of Business Laws in India.

UNIT 2: CONTRACT LAWS -INDIAN CONTRACT ACT, 1872:

Definition of Contract - essentials of a valid contract (all essentials need to be explained in great detail) - classification of contracts - breach of contract and remedies for breach of contract.

Indian Sale of Goods Act, 1930: Definition of contract of sale - essentials of contract of sale - conditions and warrantees - rights and duties of buyer - rights of an unpaid seller.

UNIT 3: INFORMATION LAWS AND ENVIRONMENT PROTECTION ACT, 1986

Right to Information Act, 2005: Objectives of the RTI Act – Scope - Method of seeking information - Eligibility to obtain information - Authorities under the Act.

Environment Protection Act, 1986: Objects of the Act - definitions of important terms – environment, environment pollutant, environment pollution, hazardous substance and occupier - types of pollution - global warming - causes for ozone layer depletion - carbon trade - rules and powers of central government to protect environment in India.

UNIT 4: COMPETITION AND CONSUMER LAWS

The Competition Act, 2002: Objectives of Competition Act - the features of Competition Act - components of Competition Act - CCI, CAT, offences and penalties under the Act.

Consumer Protection Act, 1986: Definition of the terms consumer - consumer dispute, defect, deficiency, unfair trade practices and services. -Consumer Protection Act - Consumer Redressal Agencies – District Forum - State Commission - National Commission - any two landmark judgments of the Supreme Court.

BOOK REFERENCE

1. K. Aswathappa, Business Laws, Himalaya Publishing House,
2. K.R. Bulchandni: Business Laws, HPH.
3. N.D. Kapoor, Business Laws, Sultan chand publications.
4. S.S. Gulshan, Business Law 3rd Edition, New Age International
5. S.C. Sharama&Monica : Business Law I.K. International
6. Tulsian Business Law ,Tata McGraw-Hill Education
7. Dr. K. Venkataraman, SHB Publications.
8. Kamakshi P &Srikumari P, Business Regulation
9. Dr. Alice Mani: Business Regulations, SBH.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F3500	16 weeks	CAREER PLANNING AND DEVELOPMENT	3	1	0	4

Objectives:

- The students will develop an operational understanding of the components involved in career development programs. The students will develop and understanding of the major career development theories and decision- making models. The students will become acquainted with the major career assessment instruments and techniques.

Course content:-

UNIT-1: INTRODUCTION

Career – Meaning – Definition - Why career development? -Forces that enable and lead to career development -Major stages of career development - Novation's' Model- Individual's perspective to career development. -Schein's Model – stages of career development.

UNIT-2:- CAREER ANCHORS AND VALUES

Career Movement - Factors that affect career choices - Holland's theory of vocational personalities in Work environments.

UNIT-3:- CAREER APPRAISAL

Instruments used - MBTI etc. - Career coaching and career centers - Career counseling - Career counseling competencies.

UNIT-4:- PROFESSIONAL CAREER DEVELOPMENT

Planning process- steps - Modern Challenges in careers - plateau employees etc.

Job Enrichment*:* Responsibilities of Organizations and employees in career planning.

Corporate Offerings: Individual and Team Motivation - Confidence Building - public speaking skills - Leadership skills Development - Effective Communication - Time Management - Building Presentation Skills.

Reference Books:

1. Business Communication – From Process to product, Boxman joel& Barachaw, Dryden Press, Chicago.
2. Effective Business Communications, Murphy Herta A & Peck, Tata McGraw-Business Communication- Principles & Application.
3. P. Subba Rao, Personnel & Human Resource Management.
4. Successful Business Communication, Treece Malra, Allyn and Bacon, Boston
5. V.S.P Rao, Human Resource Management, Excel Books

Course Code	Duration	Course Title	L	T	P	C
BBAD15F3600	16 weeks	MARKETING MANAGEMENT	3	1	0	4

OBJECTIVE

The objective is to enable students to understand the concept of marketing and its applications and the recent trends in Marketing.

Unit 1: INTRODUCTION TO MARKETING

Meaning & Definition – Goals – Concepts of Marketing – Approaches to Marketing – Functions of Marketing.

Recent trends in Marketing - Introduction, E-business – Tele-marketing – M-Business – Green Marketing – Relationship Marketing – Retailing – Concept Marketing and Virtual Marketing (Meaning Only).

Unit 2: MARKETING ENVIRONMENT (MACRO)

Meaning – Demographic – Economic – Natural – Technological - Political – Legal – Socio – Cultural Environment

Unit 3: MARKETING MIX

Meaning – Elements – Product – Product Mix – Product Line – Product Lifecycle – Product Planning –New Product Development – Failure of New Product – Branding – Packing and Packaging. Pricing –Objectives – Factors influencing Pricing Policy and Methods of Pricing. Physical Distribution – Meaning –Factors affecting Channel Selection – Types of Marketing Channels. Promotion – Meaning and Significance of Promotion – Personal Selling & Advertising (Meaning Only).

Unit 4: MARKET SEGMENTATION AND CONSUMER BEHAVIOUR

Meaning & Definition - Bases of Market Segmentation – Requisites of Sound Market Segmentation. Consumer Behaviour – Factors influencing Consumer Behaviour and Buying Decision Process.

CUSTOMER RELATIONSHIP MANAGEMENT

Meaning and Definition – Role of CRM – Advantages and Disadvantages

BOOKS FOR REFERENCE

1. P N Reddy &Appanniah, Marketing Management, HPH.
2. Kuranakaran, Marketing Management, Himalaya Publishers.
3. Rekha&Vibha, Marketing Management, VBH.
4. Philip Kotler, Marketing Management, Prentice Hall.
5. Bose Biplab, Marketing Management, Himalaya Publishers.
6. J.C. Gandhi, Marketing Management, Tata McGraw Hill.
7. Ramesh & Jayanti Prasad: Marketing Management, I.K. International
8. William J. Stanton, Michael J.Etzel, Bruce JWalker, Fundamentals of Marketing, McGraw HillEducation.
9. Sontakki, Marketing Management, Kalyani Publishers.
10. K. Venkataramana, Marketing Management, SHBP.
11. Dr. Alice Mani: Marketing Management, SBH.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F3700	**16 weeks**	**Indian Constitution and Human Rights**	2	1	0	3

UNIT-1: INDIAN CONSTITUTIONAL PHILOSOPHY

Features of the Constitution and Preamble-Fundamental Rights and Fundamental Duties-Directive Principles of State Policy

UNIT-2: UNION AND STATE EXECUTIVE, LEGISLATURE AND JUDICIARY

Union Parliament and State Legislature: Powers and Functions- President, Prime Minister and Council of Ministers-State Governor, Chief Minister and Council of Ministers-The Supreme Court and High Court: Powers and Functions

UNIT -3: CONCEPT AND DEVELOPMENT OF HUMAN RIGHTS

Meaning Scope and Development of Human Rights -United Nations and Human Rights- UNHCR-UDHR 1948, ICCR 1996 and ICESCR 1966

UNIT-4: HUMAN RIGHTS IN INDIA

Protection of Human Rights Act, 1993 (NHRC & SHRC) **-**First, Second and Third Generations- Human Rights**-**Judicial Activities and Human Rights

IV SEMESTER

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4100	16 Weeks	HUMAN `RESOURCE MANAGEMENT	3	1	0	4

OBJECTIVE: The objective is to familiarize the students with concepts and principles of Human Resource Management.

Course content:-

Unit 1: HUMAN RESOURCE MANAGEMENT

Introduction – Meaning of HRM – Objectives of HRM – Importance of HRM – Functions and Process of HRM – HR Manager - Duties and Responsibilities – Recent trends in HRM.

Unit 2: HUMAN RESOURCE PLANNING, RECRUITMENT & SELECTION

Meaning – Importance of Human Resource Planning – Benefits of Human Resource Planning. Recruitment– Meaning – Methods of Recruitment. Selection – Meaning – Steps in Selection Process – Problems Involved in Placement.

Unit 3: HUMAN RESOURSE TRAINING AND DEVELOPMENT

Meaning - objective and purpose of Training- Need for training - benefits of training -Identification of training needs and methods of training.

Meaning of HRD - Role of training in HRD - Knowledge Management - Knowledge Resources - Impact of Globalization on Human Resource Management - Problems in relation to Transnational and Multinationals.

Unit 4: PERFORMANCE APPRAISAL, COMPENSATION, PROMOTION AND TRANSFERS

Introduction – Meaning and Definition – Objectives – Methods of Performance Appraisal – Uses and Limitations of Performance Appraisal.

Compensation – Meaning of Compensation – Objectives of Compensation.

Meaning and Definition of Promotion - Purpose of promotion - basis of promotion - Meaning of transfer - reasons for transfer - types of transfer - right sizing of work force - need for right sizing.

BOOKS FOR REFERENCE

1. Aswathappa, Human Resource Management, Tat McGraw Hill.
2. Madhurimalall, Human Resource Management, HPH.
3. Reddy &Appanniah, Human Resource Management. HPH.
4. C.B.Mamoria, Personnel management, HPH.
5. Edwin Flippo, Personnel management, McGraw Hill.

6. SubbaRao, Personnel and Human Resources management, HPH.
7. S.Sadri& Others: Geometry of HR, HPH.
8. Rajkumar : Human Resource Management I.K. Intl
9. Michael Porter, HRM and human Relations, Juta&Co.Ltd.
10. Biswanath Ghosh, Human Resource Development and Management.
11. Rekha&Vibha – Human Resource Management, VBH.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4200	**16Weeks**	**BUSINESS RESEARCH METHODS**	**3**	**1**	**0**	**4**

OBJECTIVE: The objective is to create an awareness of the Process of Research, the tools and techniques of research and generation of reports

Course content:-

Unit 1: INTRODUCTION TO RESEARCH

Meaning – Objectives – Types of Research – Scope of Research – Research Approaches – Research Process – Research Design – Research Methods Vs Research Methodology - Steps in Research – Problem Formulation – Statement of Research Objective – Exploratory – Descriptive – Experimental Research.

Unit 2: METHODS OF DATA COLLECTION

Observational and Survey Methods – Field Work Plan - Administration of surveys - Training field investigators - Sampling methods - Sample size.

Unit 3: TOOLS FOR COLLECTION OF DATA

Questionnaire Design; Attitude measurement techniques – Motivational Research Techniques – Selection of Appropriate Statistical Techniques

Unit 4: STATISTICAL METHODS AND REPORT WRITING

Tabulation of data - Analysis of data –Testing of Hypothesis, Advanced techniques – ANOVA, Chi-Square - Discriminate Analysis - Factor analysis - Conjoint analysis - Multidimensional Scaling - Cluster Analysis (Concepts Only). Types of Reports - Business, Technical and Academic Report writing – Methodology Procedure – Contents – Bibliography

BOOKS FOR REFERENCE

1. O.R.Krishnaswamy; Research methodology in Social Sciences, HPH, 2008.
2. R. Divivedi: Research Methods in Behavior Science, Macmillan India Ltd., 2001.
3. J.K. Sachdeva: Business Research Methodology HPH
4. S.N. Murthy, V. Bhojanna: Business Research Methods Excel Books
5. Levin &Rubin: Statistics for Management, Prentice Hall of India, 2002
6. Gupta S; Research Methodology and Statistical Techniques, Deep & Deep Publication (P) Ltd., 2002
7. Thakur D: Research Methodology in Social Sciences, Deep & Deep Publications (P) Ltd.,1998.
8. Tripathi P.C:A Textbook of Research Methodology, Sultan Chand & Sons, 2002.
9. Cooper: Business Research Methods 6th edition, MC Graw Hill,
10. C.R. Kothari, Research Methodology, Vikas Publications
11. Usha Devi N, Santhosh Kumar - Business Research Methodology

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4300	**16 weeks**	**COST ACCOUNTING**	**3**	**0**	**1**	**4**

OBJECTIVE: The objective is to enable the students to understand techniques used to control as well as reduce the cost

Course content:-

UNIT 1: INTRODUCTION TO COST ACCOUNTING

Introduction –Meaning & Definition of Cost - Costing and Cost Accounting – Objectives of Costing- Comparison between Financial Accounting and Cost Accounting- Application of Cost Accounting - Designing and Installing a Cost Accounting System- Cost Concepts – Classification of Costs- Cost Unit- Cost Center – Elements of Cost – Preparation of Cost Sheet- Tenders and Quotations.

UNIT 2: MATERIAL COST

Meaning – Types – Direct material – Indirect Material- Material Control – Purchasing Procedure- Store keeping – Techniques of Inventory Control – Setting of Stock Levels- EOQ- ABC Analysis – Methods of Pricing - Material Issues- FIFO- LIFO- Weighted Average Price Method and Simple Average Price Method.

UNIT 3: LABOUR COST

Meaning – Types – Direct Labour- Timekeeping- Time booking- Idle Time- Overtime- LabourTurnover - Methods of Labour Remuneration- Time Rate System- Piece Rate System- Incentive Systems- Halsey plan- Rowan Plan- Taylor's Differential Piece Rate System and Merrick's Differential Piece Rate System- Problems.

UNIT 4: OVERHEAD COST

Meaning and Definition- Classification of Overheads- Procedure for Accounting and Control of Overheads- Allocation of overheads – Apportionment of overheads- Primary overhead Distribution summary- Secondary overhead Distribution Summary- Repeated Distribution Method and Simultaneous Equations Method- Absorption of Factory Overheads – Methods of Absorption – Machine Hour Rate- Problems.

BOOKS FOR REFERENCE

1. S P Iyengar, Cost Accounting.
2. B.S. Raman, Cost Accounting.
3. K.S. Thakur: Cost Accounting.
4. M.N. Arora, Cost Accounting.
5. N. Prasad, Costing.
6. Palaniappan&Hariharan : Cost Accounting
7. Jain &Narang, Cost Accounting.
8. Gouri Shankar; Practical Costing.
9. IM Pandey :Management Accounting

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4400	16 weeks	SERVICES MANAGEMENT	3	1	0	4

OBJECTIVE

The objective is to familiarize the students with different services and prepare them with requisite skills to manage services.

Course content:-

UNIT 1: INTRODUCTION TO SERVICES MANAGEMENT AND MARKETING

Meaning of Services – Concepts - Characteristics of Services – Classification of Services – Growth of Service Sector.

Meaning of marketing – Differences between Products and Services – Importance of Services Marketing – Marketing Mix for Services – 7 Ps (in detail) Managing Demand and Supply in Service Industry. Service Delivery Process: Role of Customer in Service delivery process- Quality issues in Services – GAP Model, Managing moments of Truth

UNIT2: TOURISM AND HOSPITALITY SERVICES

Introduction – Evolution of Tourism Industry – Concept and Nature of Tourism – Significance of Tourism Industry- Market segmentation in tourism- Marketing mix of Tourism - Recent Trends in Tourism. **Hospitality Services**: Types of Hotels –Types of Accommodation – Departments in Hotels – Customer care in Hospitality Industry.

UNIT 3: BANKING AND INSURANCE SERVICES

Banking - Introduction – Traditional Services – Modern Services – Recent Trends in Banking Services.

Insurance - Introduction – Meaning and Definition of Insurance – Types of Insurance – Life Insurance – Products of Life Insurance – General Insurance – Types of General Insurance – Insurance Agents and other Intermediaries .

UNIT 4: HEALTHCARE AND INFORMATION TECHNOLOGY ENABLED SERVICES (ITES)

Hospitals – Evolution of Hospital Industry – Nature of Service – Risk involved in Healthcare Services – marketing of medical services – Hospital extension services – Pharmacy, nursing – Medical Transcription. ITES: Introduction – Growth, Types, Job opportunities in ITES.

Reference Books;-

1.S.M.Jha services management, HPH
2. Dr. Shajahan S. Services Marketint, HpH
3. Sunil b Rao, Services management , VBH.
4. Dutta:- Services management, I.K.International
5. Cengiz hakseveretal, Services managemetn

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4500	4 weeks	ORGANISATION STUDY –MINOR PROJECT	0	0	4	4

SPECIALISATION: MARKETING

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4M10	16 weeks	PRODUCT AND BRAND MANAGEMENT	2	1	0	3

OBJECTIVE

The objective is to enable the students to acquire skills in Product & Brand Management

Course content:-

UNIT 1: PRODUCT MANAGEMENT AND DEVELOPMENT

Meaning of Product – Product Personality, Types of Products – Product Line - Product Mix - Factors influencing design of the product – Changes affecting Product Management – Developing Product Strategy - Setting objectives & alternatives - Product strategy over the lifecycle - New product development – Product Differentiation and Positioning strategies -Failure of New Product.

UNIT2: MARKET POTENTIAL & SALES FORECASTING

Forecasting target market potential and sales – Methods of estimating market and sales potential - Sales forecasting - planning for involvement in international market.

UNIT3: BRAND MANAGEMENT, DESIGNING & SUSTAINING BRANDING STRATEGIES

Meaning of Brand – Brand Development – Extension – Rejuvenation -Re launch- Product Vs Brands - Goods and services - Retailer and distributors - People and organization - Brand challenges and opportunities - The brand equity concept - Identity and image - Brand hierarchy - Branding strategy - Brand extension and brand transfer – Managing brand over time.

UNIT 4: BRAND LEVERAGING AND BRAND PERFORMANCE

Establishing a brand equity management system - measuring sources of brand equity and consumer mindset - Co-branding - celebrity endorsement - Brand Positioning & Brand Building – Brand knowledge - Brand portfolios and market segmentation – Steps of brand building - Identifying and establishing brand positioning - Defining and establishing brand values.

BOOKS FOR REFERENCE

1. Gupta SL: Brand Management, HPH.
2. Branding Concepts- Pati, Debashish, Macmillan India
3. Brand Building :M.Bhattacharjee, HPH.
4. Harsh V. Verma; Brand Management, Excel Books.
5. SubratoSengupta, Brand Positioning Strategies for Competitive Advantage, McGraw Hill.

6. The New Strategic Brand Management- Kapfere, Jean-Noel, Kogan page 5th edition
7. Das & Naveen, Brand Management Perspectives and Practices, ICFAI University Press.
8. Chaturvedi, B.M, Total Brand Management: An Introduction-, ICFAI University Press.
9. Ray, Brand Management Financial Perspectives, ICFAI University Press.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4M20	**16 weeks**	**CONSUMER BEHAVIOR**	**2**	**1**	**0**	**3**

OBJECTIVE

The objective is to enable the students to acquire skills in consumer behavior

Course content:

UNIT 1: INTRODUCTION TO CONSUMER BEHAVIOUR

Introduction to Consumer Behaviour - A managerial & consumer perspective - Need to study Consumer Behaviour - Applications of consumer behaviour knowledge - current trends in Consumer Behaviour - Market segmentation & consumer behaviour.

UNIT 2: INDIVIDUAL AND ENVIRONMENTAL DETERMINANTS

Consumer needs & motivation - personality and self-concept - consumer perception - learning & memory - nature of consumer attitudes - consumer attitude formation and change. Family influences - Influence of culture - subculture & cross cultural influences - group dynamics and consumer reference groups - social class & consumer behaviour.

UNIT 3: CONSUMER'S DECISION MAKING PROCESS

Problem recognition - Search & Evaluation - Purchase processes - Post-purchase behaviour - personal influence& opinion leadership process - Diffusion of innovations - Models of Consumer Behaviour - Researching Consumer behaviour - Consumer research process.

UNIT 4: CONSUMER SATISFACTION & CONSUMERISM

Concept of Consumer Satisfaction - Working towards enhancing consumer satisfaction - sources of consumer dissatisfaction - dealing with consumer complaint. Concept of consumerism - consumerism in India - The Indian consumer - Reasons for growth of consumerism in India - Consumer protection Act 1986.

BOOKS FOR REFERENCE:

1. Leon. G. Schiffman & Leslve Lazer Kanuk; Consumer behaviour; 6th Edition; PHI, New Delhi, 2000.
2. Suja.R.Nair, Consumer behaviour in Indian perspective, First Edition, Himalaya Publishing House, Mumbai, 2003.
3. Batra/Kazmi; Consumer Behaviour.

4. David. L. Loudon & Albert J. Bitta; Consumer Behaviour; 4th Edition, Mcgraw Hill, Inc; New Delhi, 1993.
5. K. Venkatramana, Consumer Behaviour, SHBP.
6. Assael Henry; Consumer behaviour and marketing action; Asian Books(P) Ltd, Thomson learning, 6th Edition; 2001.
7. Jay D. Lindquist & M. Joseph Sirgy, Shopper, Buyer and Consumer Behaviour, 2003.
8. Blackwell; Consumer Behaviour, 2nd Edition.
9. S.A.Chunawalla : Commentary on Consumer Behaviour, HPH.
10. Sontakki; Consumer Behaviour, HPH.
11. Schiffman; Consumer Behaviour, Pearson Education.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5M30	**16 weeks**	**ADVERTISING**	**2**	**1**	**0**	**3**

Objectives: The objectives of the course is to familiarize the students with the basic concepts tools and techniques of advertising used in marketing.

Course content:-

UNIT-1: INTRODUCTION TO ADVERTISING

Advertising meaning - nature and importance of advertising - types and objectives - Audience selection - Setting of advertising budget - determinants and major methods - Communication process - basic and elements - Marketing Communication - response hierarchy - models and alternatives

UNIT -2: MESSAGE DECISIONS AND DEVELOPMENT

Major media types – their merits and demerits - Advertising through internet and interactive media - issue and considerations - Factors influencing media choice - media selection - media scheduling.
Advertising creativity - Advertising appeals - Advertising copy and elements of print advertisement creativity - Tactics for print advertisement.

UNIT III: MEASURING ADVERTISING EFFECTIVENESS

Arguments for and against measuring effectiveness - Advertising testing process - Evaluating communication and sales effects - Pre-and Post-testing techniques.

UNIT IV: ORGANISATIONAL ARRANGEMENT

a) Advertising Agency – Role - types and selection of advertising agency - Reasons for evaluating advertising agencies.
b) Social ethical and legal aspects of advertising in India - Recent developments and issues in advertising.

Suggested Readings:

1. Belch and Belch, Advertising and Promotion, Tata McGraw Hill Co.
2. Sharma, Kavita, Advertising; Planning and Decision Making, Taxmann Publication Pvt. Ltd.
3. Mahajan. J.P., and Ramki Advertising and Brand Management Ane Books Pvt Ltd. New Delhi.
4. Burnett, Wells, and Moriatty, Advertising; Principles and Practice, Pearson Education.
5. Shimp, Terence A, Advertising and Promotion: An IMC Approach, South Western Cengage Learning.
6. O'Guinn, Advertising and Promotion: An Integrated Brand Approach, Cengage Learning.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5M40	**16 weeks**	**RETAIL MANAGEMENT**	**2**	**1**	**0**	**3**

OBJECTIVE

The objective is to enable students to acquire skills in Retail Management.

Course content:-

UNIT 1: INTRODUCTION TO RETAILING.

Definition – functions of retailing - types of retailing – forms of retailing based on ownership - Retail theories – Wheel of Retailing – Retail life cycle - Retailing in India – Influencing factors – present Indian retail scenario - Retailing from the International perspective

UNIT 2: RETAIL OPERATIONS.

Choice of Store location – Influencing Factors, Market area analysis – Trade area analysis – Rating Plan method - Site evaluation - Retail Operations - Store Layout and visual merchandising – Store designing – Space planning, Retail Operations - Inventory management – Merchandise Management – Category Management.

UNIT 3: RETAIL MARKETING MIX.

Retail marketing mix – Introduction. **Product** – Decisions related to selection of goods (Merchandise Management revisited) –Decisions related to delivery of service. **Pricing** – Influencing factors – approaches to pricing – price sensitivity - Value pricing – Markdown pricing. **Place** – Supply channel – SCM principles – Retail logistics – computerized replenishment system – corporate replenishment policies.

Promotion – Setting objectives – communication effects - promotional mix. Human Resource Management in Retailing – Manpower planning – recruitment and training – compensation – performance appraisal.

UNIT 4: IMPACT OF IT IN RETAILING.

Non store retailing (E tailing) The impact of Information Technology in retailing - Integrated systems and networking – EDI – Bar coding – Electronic article surveillance – Electronic shelf labels – customer database management system - Legal aspects in retailing - Social issues in retailing - Ethical issues in retailing.

BOOKS FOR REFERENCE

1. Barry Bermans and Joel Evans, "Retail Management – A Strategic Approach", 8th edition, PHI Private Limited, New Delhi, 2002.
2. Suja Nair: Retail Management, HPH.
3. A.J. Lamba, "The Art of Retailing", 1st edition, Tata Mc GrawHill, New Delhi, 2003.
4. SwapnaPradhan, Retailing Management, 2/e, 2007 & 2008, TMH
5. K. Venkatramana, Retail Management, SHBP.
6. Siva Kumar; Retail Marketing, Excel Books.
7. James R. Ogden & Denise T. Ogden, Integrated Retail Management 2007, Biztantra Cengage Learning
8. R.S. Tiwari : Retail Management , HPH
9. AraifSakh: Retail Management, HPH.
10. Levy &Weitz, Retail Management,, TMH 5th Edition 2002
11. Rosemary Varley, Mohammed Rafiq, Retail Management, Palgrave Macmillan

FINANCE SPECIALISATION

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4F10	**16 weeks**	**FINANCIAL MARKETS AND SERVICES**	**2**	**1**	**0**	**3**

OBJECTIVE

To familiarize the students with Traditional and Modern Financial Services.

Course content:-

UNIT 1: FINANCIAL MARKETS

Primary Market - Meaning – Features – Players of Primary Market – Instruments in Primary Market (Names) – Procedure for issuing Equity and Debentures – SEBI guidelines towards the issue of Equity Shares and Debentures – Merits and Demerits of Primary Markets Secondary Market-Meaning – Structure – Functions – Trading and Settlement System of Stock Exchange Transactions – Players in the Stock Market – Merits and Demerits of Stock Markets – Reforms in Stock Market – OTCEI and NSE – Origin – Function – Merits Demerits.

UNIT 2: NON – BANKING FINANCIAL INTERMEDIARIES

Investment and Finance Companies – Merchant Banks – Hire Purchase Finance – Lease Finance – Housing Finance – Venture Capital Funds and Factoring.

UNIT 3: SEBI AND MUTUAL FUNDS

Objectives of SEBI - Organization – Functions and Functioning of SEBI – Powers of SEBI – Role of SEBI in marketing of Securities and Protection of Investor Interest. Concept of Mutual Funds – Growth of Mutual Funds in India – Mutual Fund Schemes – Money Market Mutual Funds – Private Sector Mutual Funds – Evaluation of the performance of Mutual Funds – Functioning of Mutual Funds in India.

UNIT 4: RECENT TRENDS IN FINANCIAL SERVICES

Personalized Banking – ATM – Tele-banking & E-banking – Credit and Debit Card – Customization of Investment Portfolio – Financial Advisors.

BOOKS FOR REFERENCE

1. Vasant Desai: Financial Markets & Financial Services, Himalaya Publishing House.
2. Meir Khon: Financial Institutions and Markets, Tata McGrah Hill
3. L M Bhole: Financial Institutions and Markets, Tata Mcgrah Hill
4. E Gardon& K Natarajan: Fiancial Markets & Services
5. V.A. Avadhani : Financial Services in India.
6. R.M Srivastava / D. Nigam; Dynamics of Financial Markets & Institutions in India

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4F20	**16 weeks**	**EXIM & FOREX MANAGEMENT**	**2**	**1**	**0**	**3**

OBJECTIVES

To enable the students to acquire skills in Exim & Forex Management.

Course content:-

UNIT 1: FOREIGN EXCHANGE MARKET

The Foreign Exchange Market - Structure and Organization – Mechanics or Currency Trading – Types of Transactions and Settlement Dates – Exchange Rate Quotations and Arbitrage – Arbitrage with and without Transaction Costs – Swaps and Deposit Markets – Option Forwards – Forward Swaps and Swap Positions – Interest Rate Parity Theory.

UNIT 2: MARKET FUTURE

Currency and Interest Rate Futures - Future Contracts - Markets and Trading Process - Future Prices Spot and Forward - Hedging and Speculation with Currency Futures – Interest Rate Futures – Foreign Currency Options – Option Pricing Models – Hedging with Currency Options – Future Options – Innovations.

UNIT 3: EXCHANGE RATE MANAGEMENT

Exchange Rate Determination and Forecasting – Setting the Equilibrium Spot Exchange Rate – Theories of Exchange Rate Determination – Exchange Rate Forecasting.

Management of Interest Rate Exposure – Nature and Measurement – Forward Rate Agreements (FRA's) Interest Rate Options – Caps - Floors and Collars - Cap and Floors – Options on Interest Rate Futures - Some Recent Innovations – Financial Swaps.

UNIT 4: RISK MANAGEMENT

Foreign Exchange Risk Management – Hedging, Speculation and Management of Transaction Exposure – Using Forward Markets for Hedging – Hedging with Money Market - Currency Options and Currency Futures – Internal Strategies – Speculation in Foreign Exchange and Money Market.

BOOKS FOR REFERENCE

1) Shapiro Alan. C., Multinational Financial Management, Prentice Hall, New Delhi
2) Chaudhuri & Agarwal: Foreign Trade and Foreign Exchange, HPH
3) Apte P.G., International Financial Management, Tata McGraw Hill, New Delhi
4) Jain: Export Import Procedures and documentation
5) Mcrae T.N and D.P Walkar, Foreign Exchange Management, Prentice Hall.
6) Evilt H.E., Manual of Foreign Exchange
7) Holgate H.C.F, Exchange Arithmetic
8) Rajwade A.V., Foreign Exchange Risk Management, Prentice Hall of India
9) A. Kumar; Export and Import Management.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5F30	**16 weeks**	**INTERNATIONAL FINANCIAL MANAGEMENT**	**2**	**0**	**1**	**3**

Objectives :- To enable the students to understand the concepts of financial management and the role of financial management in field of Globalizstion

Course content:-

UNIT – 1: INTERNATIONAL FINANCIAL MANAGEMENT

Introduction - Meaning of International Finance - Issues involved in International business Finance - Currency to be used - Credit worthiness - Methods of Payment - Foreign Exchange Markets. **Meaning of International Financial Management** - Scope and significance of International financial management in International markets.

UNIT – 2: FOREIGN EXCHANGE RATES:

Need for foreign exchange - Foreign exchange market and Market intermediaries - Exchange rate determination - Foreign Exchange risk – Forwards - futures – swaps - options - Valuation of future and swaps – valuation of options and efficiency of the exchange market Convertibility of a rupee and its implications.

UNIT – 3: INTERNATIONAL FINANCIAL MARKETS:

Foreign Institutional Investors – Regulations governing Foreign Institutional Investors India; Global Depository Receipts – Meaning; Foreign Direct Investment (FDI) – growth FDI; Advantages and Disadvantages of FDI to Host country and home country.

UNIT –4: INTERNATIONAL RISK MANAGEMENT:

Types of Risk – Political – commercial - exchange control restrictions and remittance differing tax system - sources of funds - exchange rate fluctuations - different stages and rates of inflation - risks of non-payment - Managing Risk - Internal and external technologies.

BOOKS FOR REFERENCE:

1. Avadhani: International Financial Management
2. Mittal, International Rate Foreign Exchange Tariff policy
3. Venkataraman K.V, Finance of Foreign Trade and Foreign Exchange
4. Genaro C da Costa; International Trade and Payments
5. Chowdery, Finance of Foreign Trade and Foreign Exchange
6. Balachandran, Foreign Exchange.
7. Somanath : International Financial Management, I.K. International
8. Srivastava, International Finance.
9. MadhuVij; International Financial Management 3rd Edition.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5F40	**16 weeks**	**INVESTMENT & PORTFOLIO MANAGEMENT**	**2**	**1**	**0**	**3**

Objectives :- To enable the students and develop skills in analyzing various types of securities and to develop necessary skills in students to design and revise a portfolio of securities

Course content:-

UNIT 1: INTRODUCITON TO INVESTMENT MANAGEMENT

Meaning of Investment – Selection of Investment – Classification of Securities – Risk and Uncertainty – Types of Risks – Risk and Expected Return – Measurement of Portfolio Risk – Benefits and Diversification – Investment Strategies – Types of Companies and Stocks – Matrix approach in Investment Decision – Investment Avenues

UNIT 2: SECURITY ANALYSIS

Introduction – Fundamental Analysis – Economic Analysis – Industry Analysis – Company Analysis, Technical Analysis – Dow Theory – Advanced Declined Theory – Chartism Assumptions of Technical Analysis.

UNIT 3: MODERN PORTFOLIO THEORY AND MEASURES

Introduction – Mean –Variance Model – Markowitz Model – Sharpe single index model – Capital Market Line – Market Portfolio – Capital Asset Pricing Model – Security Market Line – Beta Factor – Alpha and Beta Coefficient – Arbitrage Pricing Model.
Sharpe’s measure - Jensen’s measure,- treynor’s measure.

UNIT 4: GLOBAL MARKETS

Global Investment Benefits – Introduction to ADRs, GDRs, FCCDs, Foreign Bonds, Global Mutual Funds – Relationship between Trends in Global Markets and the Domestic Markets

BOOKS FOR REFERENCE

1. Preeti Singh: Investment Management
2. Kevin, Investment and Portfolio Management
3. A.P. Dash: Security Analysis and Portfolio Management, I.K. International
4. Prasanna Chandra, Investment Analysis and Portfolio Management, Mcgraw-Hill
5. Fischer and Jordan, Security Analysis and Portfolio Management, HPH
6. Avadhani, Investment Analysis and Portfolio Management, HPH
7. Punithavathy, Pandian, Investment Analysis and Management.
8. Sudhindra Bhatt; Security Analysis and Portfolio Management.

HRM SPECIALISATION

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4H10	**16 weeks**	**KNOWLEDGE MANAGEMENT**	**2**	**1**	**0**	**3**

Objective: to understand the innovation and creativity of managing the knowledge and how new knowledge is created and prepare the frame work in an organisation.

Course content:-

UNIT -1: THE PARADIGM OF LEARNING ORGANIZATIONS

The paradigm of learning organizations - lessons in learning and creativity - learning organizations – paradigm of strategy and management - life long creates trails of lifelong creators - model of lifelong creativity - mastering creative problems solving - models of creative problems solving - model of creative intelligence - convergent thinking - acquiring a creative persona - techniques of creative problems solving and creativity.

UNIT-2: TECHNIQUES OF CREATIVE PROBLEM SOLVING

Techniques of creativity - problem decomposition - information search - breaking stereotyped response – unblocking - mutual stimulation – imaging – fusioning – ideating - exteremisation and dialectical – brainstorming - the when of creativity techniques – attributing changing and morphological analysis

UNIT-3: ISSUES, THEMES AND THE ROLE OF INFORMATION TECHNOLOGY ON LEARNING ORGANIZATIONS.

Core issues and themes is building learning enterprises - vision and strategy - nature of the organization structure - an infrastructure for knowledge management - role of information technology in knowledge management - information technology and knowledge approaches.

UNIT-4: TECHNIQUES TO LEARNING ORGANIZATIONS, MANAGEMENT SYSTEM

Learning companies - fostering knowledge and learning - a brief overview of some techniques - methods and approaches - learning organizations and management of change – activities and case studies.

Knowledge management systems – issues - challenges and benefits - drivers of knowledge - tacit and explicit knowledge - implementing knowledge management solutions - knowledge management system in learning organization.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F4H20	16 weeks	EMPLOYEE RELATIONSHIP MANAGEMENT	2	1	0	3

Objective: to understand various theories and framework of employee relationship to enhance the organizational performance and effectiveness.

Course content:-

UNIT- 1:: INDUSTRIAL RELATIONS

Meaning & Objectives – Importance - Approaches to Industrial Relations – Unitary – Pluralistic - Marxist. Role of Three Actors to Industrial Relations – State - Employer &Employees - Causes for poor IR - Developing sound IR. Ethical approach to IR: Idea of trusteeship- Principles & features - Code of conduct.

UNIT- 2: TRADE UNION

Meaning, why do workers join unions, Types of trade unions, Theories to trade Union, Trade union movement in India, Problems of trade unions, Functions of trade unions, Measures to strengthen trade unions, Trade union Act – Registration of trade unions, Need for Recognition & Rights to recognition of trade unions, Central trade unions in India.

UNIT -3: INDUSTRIAL DISPUTES

Definition, Causes of Industrial disputes, Types of Industrial disputes, Prevention of Industrial disputes, Settlement of Industrial disputes. Industrial Dispute Act – Conditions to Strikes, Lock-outs, Lay-off & Retrenchment and Laws relating to standing orders.

UNIT- 4 COLLECTIVE BARGAINING AND QUALITY OF WORK LIFE

Definition - Importance - Prerequisites of collective bargaining – Union bargaining process – Types of bargaining– Collective bargaining in India. Grievance & Disciplinary procedure – Meaning - Need & procedure

Meaning of quality of work life – Quality Circles- Objectives- Process - Structure and problems- workers participation in management.

REFERENCE

1. B.D Singh - Industrial Relations – Excel Books
2. Mamoria& Mamoria - Dynamics of Industrial Relations in India – HPH

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5H30	16 weeks	INTERNATIONAL HUMAN RESOURCES MANAGEMENT	2	1	0	3

Objective: to understand various approaches adopted in international scenario in human resources management.

Course content:-

UNIT- 1: INTERNATIONAL H.R.M

Difference between Domestic HRM and IHRM - Managing International HR activites- HR planning - Recruitment & Selection - Training & Development - Performance management – Remuneration - Repatriation & employee relations - Socio-Political Economic System – U.S, U.K, Japan and India – a comparative analysis.

UNIT- 2: INTERNATIONAL RECRUITMENT AND SELECTION

Approaches – Ethnocentric – Polycentric – Geocentric - Regiocentric. Selection: Factors in Expatriate selection – Technical ability - Cross-cultural suitability - Family requirements, MNE requirements.

UNIT- 3: HR INFORMATION SYSTEM and TQM

Meaning – Need - Advantages and uses - Designing of HRIS - Computerized HRIS -Limitation of HRIS. Computerized skill inventories -Global Talent Search.

Principles of TQM - Methods of Total Quality Management - HRM & TQM, -HR strategy to TQM.

UNIT- 4: GLOBALISATION & HRM

Impact of globalization on Employment - HR Development - wage & benefits - Trade unions - Collective bargaining - Participative management & Quality circles - Ethical issues in HR - Changing environment of HRM - Internal and External factors - Internal factors – Human Resource of Country - changing demands of employers - employees organization - External factors – Change in Technology - Legal and Government - Customer Social factors - Economic and Political factors and talent management.

REFERENCE

1. N Sengupta&Mousumi S Bhattacharya – International Human Resource Management – Excel Books
2. S.Jayashree – What Every MBA Should Know About HRM - HPH

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5H40	**16 weeks**	**PERFORMANCE AND COMPENSATION MANAGEMENT**	**2**	**1**	**0**	**3**

Objective: Students should familiarize themselves on various components of compensation and its related to PMS.

Course content:-

UNIT- 1: PERFORMANCE MANAGEMENT

Definition – Objectives - Need for Appraisal - Essentials of performance appraisals and problems of performance appraisal - Methods of Performance Appraisal - Traditional and Modern Methods- Graphic Rating-Scale - Straight Ranking Method - Paired Comparison Method - Critical Incident Method - Group Appraisal - Confidential Methods - Behavioral Anchored Rating Scale (BARS) - Assessment centers.

UNIT- 2: WAGE & SALARY ADMINISTRATION

Nature and Scope – Compensation - Wage determination process - Factors Influencing wage and Salary Administration. Wage – Theories of Wages - Types of wages – Time rate - piece rate - debt method - Wage differentials.

UNIT- 3: INCENTIVES AND FRINGE BENEFITS

Incentives – Definition - Types of Incentives - Individual incentives : - Measured day Work - Piece work - standard hour - Gain sharing - its advantages and disadvantages - Organization Wide incentives – Scanlon Plan - Kaiser Plan - Profit sharing - Non-financial incentives, **Fringe Benefits** – Definition – Objectives - Types of Fringe Benefits

UNIT- 4: INDIVIDUAL GROUP VARIABLE COMPENSATION

Pay for Performance - Pay by Seniority - Group Piece rate - Production sharing plan - Employee Profit sharing - Employee stock ownership - Gain Sharing

INCENTIVES AND RETIREMENT PLANS - Basic Pay - Provisions for Dearness allowance- Calculation of total compensation package - various methods of

compensating cost of living - Neutralization factors. Executive Compensation Plan - Retirement Plan

V SEMESTER

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5100	**16 weeks**	**INTERNATIONAL BUSINESS**	**3**	**1**	**0**	**4**

OBJECTIVE

The objective of this subject is to facilitate the students in understanding International Business in a multicultural world.

Course content:-

UNIT 1: INTRODUCTION TO INTERNATIONAL BUSINESS

Meaning and Definition– nature and characteristics of International Business-stages-Theories of International Trade- Advantages & Disadvantages.

UNIT 2: MODES OF ENTRY INTO INTERNATIONAL BUSINESS

Mode of Entry – Exporting – Licensing – Franchising – Contract Manufacturing – Turn Key Projects –Foreign Direct Investment – Mergers, Acquisitions and Joint Ventures – Comparison of different modes of Entry.

UNIT 3: GLOBALIZATION AND MNC

Globalization: Meaning - Features – Stages –Production –Investment and Technology, Globalization –Advantages and Disadvantages – Methods and Essential Conditions for Globalization.

MNC's and International Business: Definitions – Distinction between Indian Companies – MNC – Global companies and TNC – Organizational Transformations – Merits and Demerits of MNCs in India

UNIT 4: INTERNATIONAL MARKETING INTELLIGENCE AND EXIM TRADE

Information required – Source of Information – International Marketing Information System and Marketing Research.

Export Trade - Procedure, Steps & Documentation– Export Financing –Documents related to Export Trade – Import Trade –Steps - Documentations and Problems - Balance of Payment – Disequilibrium and Measures for Rectification

BOOKS FOR REFERENCE

1. Dr. Aswathappa International Business, Tata McGraw Hill.
2. P. SubbaRao – International Business – HPH
3. Shyam Shukla; International Business, Excel Books.
4. Francis Cherunilam; International Business, Prentice Hall of India
5. MahuaDutta, International Business, I.K. Intl
6. J. Maskeri- International Business
7. Rosy Joshi; International Business, Kalyani Publishers.
8. Venkataramana. K, International Business, SHBP.
9. Subhasre S – International Business, HPH.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5200	**16 weeks**	**ENTREPRENEURSHIP DEVELOPMENT**	**3**	**1**	**0**	**4**

OBJECTIVE:

To enable students to understand the basic concepts of entrepreneurship and preparing a business plan to start a small industry.

Course content:-

Unit 1: ENTREPRENEURSHIP

Introduction – Meaning& Definition of Entrepreneurship, Entrepreneur & Enterprise –Functions of Entrepreneur - Factors influencing Entrepreneurship - Pros and Cons of being an Entrepreneur – Qualities of an Entrepreneur – Types of Entrepreneur

Unit 2: SMALL SCALE INDUSTRIES

Meaning &Definition – Product Range - Capital Investment - Ownership Patterns – Meaning and importance of Tiny Industries - Ancillary Industries - Cottage Industries. Role played by SSI in the development of Indian Economy - Problems faced by SSIs and the steps taken to solve the problems - Policies Governing SSIs.

Unit 3: FORMATION OF SMALL SCALE INDUSTRY

Business opportunity - scanning the environment for opportunities - evaluation of alternatives and selection based on personal competencies - Steps involved in the formation of a small business venture – location - clearances and permits required – formalities - licensing and registration procedure - Assessment of the market for the proposed project – Financial – Technical - Market and Social feasibility study.

UNIT 4: BUSINESS PLAN (BP) AND PROJECT ASSISTANCE

Meaning – importance – preparation –BP format: Financial aspects of the BP Marketing aspects of the BP - Human Resource aspects of the BP - Technical aspects of the BP - Social aspects of the BP - Common pitfalls to be avoided in preparation of a BP.

Financial assistance through SFCs – SIDBI - Commercial Banks - IFCI - Non-financial assistance from DIC – SISI – AWAKE - KVIC - Financial incentives for SSIs

and Tax Concessions - Assistance for obtaining Raw Material – Machinery - Land and Building and Technical Assistance - Industrial Estates - Role and Types.

BOOKS FOR REFERENCE

1.Narayana Reddy p. Entrepreneurship Text and Cases, Cengage learning, new Delhi.
1. Vasanth Desai, Management of Small Scale Industry, HPH
2. Mark. J. Dollinger, Entrepreneurship – Strategies and Resources, Pearson Edition.
3. Dr. Venkataramana ; Entrepreneurial Development, SHB Publications
4. UdaiPareek and T.V. Rao, Developing Entrepreneurship
5. Rekha&Vibha – Entrepreneurship Development, VBH
6. S.V.S. Sharma, Developing Entrepreneurship, Issues and Problems
7. B. Janakiraman ,Rizwana M: Entrepreneurship Development, Excel Books
8. Srivastava, A Practical Guide to Industrial Entrepreneurs
9. Anil Kumar: Small Business and Entrepreneurship I.K. International Publishers

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5300	**16 weeks**	**INCOME TAX**	**3**	**0**	**1**	**4**

OBJECTIVE

The objective of this subject is to expose the students to the various provision of Income Tax Act relating to computation of Income individual assesses only.

Course content:-

UNIT 1: INTRODUCTION TO INCOME TAX

Income Tax: Brief History - Legal Frame Work – Types of Taxes - Cannons of Taxation – Important Definitions: Assessment – Assessment Year – Previous Year – Exceptions to the general rule of Previous Year - Assessee – Person – Income - Casual Income – Gross Total Income – Total Income – Agricultural Income

Residential Status: Determination of Residential Status of an individual (simple problems) - Incidence of Tax (Simple Problems on Computation of Gross Total Income).

Exempted Incomes: Introduction – Exempted Incomes U/S 10 (Restricted to Individual Assessee) – Only theory

UNIT 2: INCOME FROM SALARY

Meaning & Definition – Basis of Charge – Allowances – Fully Taxable Allowances – Partly Taxable Allowances - House Rent Allowance - Entertainment Allowance - Transport Allowance - Children Education & Hostel Allowances - Fully Exempted Allowances – Perquisites – Tax Free Perquisites – Perquisites Taxable in all Cases - Rent free accommodation - Concessional accommodation - Personal obligations of the employee met by the employer – Perquisites Taxable in Specified Cases – Gardener – Sweeper – Gas –Electricity - Water and Motor car facility (when the motor car is owned or hired by the employer)– Provident Funds – Deductions from Salary U/S 16 – Problems on Income from Salary(excluding retirement benefits).

UNIT 3: INCOME FROM HOUSE PROPERTY

Basis of Charge – Exempted Incomes from House Property – Annual Value – Determination of Annual Value – Loss due to Vacancy – Deductions from Annual Value – Problems on Income from House Property(Excluding Pre-Construction interest)

UNIT 4: INCOME FROM BUSINESS AND PROFESSION AND TOTAL INCOME

Meaning and Definition of Business & Profession – Expenses & losses Expressly Allowed – Expenses and losses Expressly Disallowed – Expenses Allowed on Payment Basis - Problems on computation of income from Business of Sole Proprietor.

Income from **Capital Gains (**excluding exemptions **-** Theory only) **- Income from Other Sources** (Theory only) - Deductions **U/S 80 C, D & G**. Simple problems on Computation of Total income of an Individual

BOOKS FOR REFERENCE

1. Dr. Vinod K. Singhania: Direct Taxes – Law and Practice, Taxmann publication.
2. B.B. Lal: Direct Taxes, Konark Publisher (P) ltd.
3. Dr. Mehrotra and Dr. Goyal: Direct Taxes – Law and Practice, SahityaBhavan Publication.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5400	**16 week**	**INDIAN ECONOMY**	**3**	**1**	**0**	**4**

4. DinakarPagare: Law and Practice of Income Tax, Sultan Chand and sons.
5. Gaur &Narang: Income Tax, Kalyani Publisher s

Objective: To acquaint the students with the policy regimes, structure and sect oral trends of Indian economy.

Course content:-

UNIT 1: BASIC ISSUES IN ECONOMIC DEVELOPMENT

Concept and Measures of Development -Underdevelopment-Human Development - Basic Features of the Indian Economy at Independence - Composition of national income and occupational structure- the agrarian scene and industrial structure.

UNIT 2: POLICY REGIMES

The evolution of planning and import substituting industrialization- Economic reform and liberalization.

UNIT 3: GROWTH, DEVELOPMENT AND STRUCTURAL CHANGE

a) The experience of Growth - Development and Structural Change in different phases of growth and policy regimes across sectors and regions.
b) The Institutional Framework - Patterns of assets ownership in agriculture and industry; Policies for restructuring agrarian relations and for regulating concentration of economic power;
c) Changes in policy perspectives on the role of institutional framework post 1991.

d) Growth and Distribution - Unemployment and Poverty; Human Development; Environmental concerns.
e) Demographic Constraints - Interaction between population change and economic development

UNIT 4: SECTORAL TRENDS AND ISSUES

a) **Agriculture:**
Agrarian growth and performance in different phases of policy regimes i.e. pre green revolution and the two phases of green revolution - Factors influencing productivity and growth - the role of technology and institutions - price policy - the public distribution system and food security.
b) **Industry and Services:**
Phases of Industrialisation – the rate and pattern of industrial growth across alternative policy regimes - Public sector – its role - performance and reforms - The small scale sector -Role of Foreign capital.
c) **The Financial Sector:**
Structure, Performance and Reforms - Foreign Trade and balance of Payments - Structural Changes and Performance of India's Foreign Trade and Balance of Payments - Trade Policy Debate - Export policies and performance - Macro Economic Stabilisation and Structural Adjustment - India and the WTO - India at the United Nations - Security Council Reforms.

Suggested Readings:

1. Mishra and Puri, *Indian Economics*, Himalaya Paublishing House
2. Gaurav Dutt and KPM Sundarum and Ashwani Mahajan, *Indian Economy*, S. Chand & Company.
3. Kapila, Uma., (ed), *Indian Economy since Independence,* Relevant articles.
4. Deepashree, *Indian Economy, Performance and Polices,* Scholar Tech. New Delhi
5. Bettleheim. Charles *India Independent*. Chapters 1, 2 and 3.
6. Bhagwati, J. and Desai, P*. India: Planning for industrialization*, OUP, Ch 2.
7. Patnaik, Prabhat. *Some Indian Debates on Planning*. T. J. Byres (ed.). The Indian Economy: Major Debates since Independence, OUP.
8. Ahluwalia, Montek*S. State-level Performance under Economic Reforms in India* in A. O.
9. Krueger. (ed.). Economic Policy Reforms and the Indian Economy, The University of Chicago Press.
10. Dreze, Jean and Amartya Sen. *Economic Development and Social Opportunity*. Ch. 2. OUP.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F5500	**16 weeks**	**MANAGEMENT ACCOUNTING**	**3**	**0**	**1**	**4**

OBJECTIVE

The objective of this subject is to enable the students to understand the analysis and interpretation of financial statements with a view to prepare management reports for decision- making.

Course content:-

UNIT 1:- INTRODUCTION TO MANAGEMENT ACCOUNTING

Meaning – Definition- objectives- Nature and scope- Role of Management Accountant- Relationship between Financial Accounting and Management Accounting - Relationship between cost Accounting and Management Accounting.

ANALYSIS OF FINANCIAL STATEMENTS :- Types of Analysis – Methods of Financial Analysis – Comparative Statements – Common Size Statements – Trend Analysis – Problems.

UNIT-2: FUND FLOW STATEMENT

Meaning and concept of Fund – Meaning and Definition of Fund Flow statement- Uses and Limitations of Fund flow Statement- Procedure of Fund Flow statement- Statement of Changes in Working Capital- Statement of Funds from operation – statement of Sources and Application of Funds – Problems.

UNIT -3: CASH FLOW STATEMENT

Meaning and Definition of Cash Flow Statement- Differences between cash flow Statement and Fund Flow Statement – Uses of Cash flow statement – Limitations of Cash Flow statement – Provisions of AS-3 – Procedure of Cash Flow Statement – Concept of Cash and Cash Equivalents – Cash flow from operating Activities – Cash flow from Investing Activities and Cash flow from Financing Activities – Preparation of Cash Flow Statement according To AS-3 (indirect Method Only)

UNIT -4: RATIO ANALYSIS

Meaning and Definition of Ratio, Classification of Ratios, Uses and Limitations – Meaning and types of Ratios Analysis – Problems on Ratio Analysis- Preparation of Financial statements with the help of Accounting Ratios.

Reference Books:

1. Dr. S.N. Maheswari, Management Accounting
2. Sexana, Management Accounting
3. J. Madde Gowda: Management Accounting
4. B.S. Raman, Management Accounting
5. Sharma and Gupta, Management Accounting.

VI SEMESTER

Course Code	Duration	Course Title	L	T	P	C
BBAD15F6100	**16 weeks**	**STRATEGIC MANAGEMENT**	**3**	**1**	**0**	**4**

OBJECTIVE: The Objective of this subject is to expose the students to the various strategic issues such as strategic planning, implementation and evaluation etc. and preparation of project reports.

Course content:-

UNIT 1: INTRODUCTION TO STRATEGIC MANAGEMENT

Introduction - Meaning and Definition – Need – Process of Strategic Management – Strategic Decision Making – Business Ethics – Strategic Management.

UNIT 2: STRATEGIC PLANNING

Strategic Planning Process – Strategic Plans during recession, recovery, boom and depression – Stability Strategy – Expansion Strategy – Merger Strategy – Retrenchment Strategy – Restructure Strategy – Levels of Strategy – Corporate Level Strategy – Business Level Strategy and Functional Level Strategy – Competitive Analysis – Porter's Five Forces Model.

UNIT 3: IMPLEMENTATION OF STRATEGY

Aspects of Strategy Implementation – Project Manipulation – Procedural Implementation – Structural Implementation – Structural Considerations – Organizational Design and Change – Organizational Systems. Behavioral Implementation – Leadership Implementation – Corporate Culture – Corporate Policies and Use of Power. Functional and Operational Implementation – Functional Strategies – Functional Plans and Policies. Financial – Marketing – OPERATIONAL and Personnel dimensions of Functional Plan and Policies – Integration of Functional Plans and Policies.

UNIT 4: STRATEGY EVALUATION

Strategy Evaluation and Control - Operational Control - Overview of Management Control – Focus on Key Result Areas.

BOOKS FOR REFERENCE

1. Dr. Aswathappa, Business Environment for Strategic Management, Tata McGraw Hill.
2. Subbarao: Business Policy and Strategic Management, HPH.
3. Charles W.L Hill and Gareth R. Jones, Strategic Management an Integrated Approach,
Cengage Learning
4. AzharKazmi, Business Policy and Strategic Management, Tata McGraw Hill
5. C. AppaRao; Strategic Management and Business Policy, Excel Books.
6. Ghosh P.K., Business Policy and Strategic Planning and Management, Tata McGraw Hill.
7. Pillai, Strategic Management,
8. Lawerence, Business Policy and Strategic Management, Tata McGraw Hill.
9. Sathyashekar : Business Policy and Strategic Management, I.K International Publishing
House Pvt. Ltd.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F6200	**16 weeks**	**BUSINESS ETHICS & CORPORATE GOVERNANCE**	**3**	**1**	**0**	**4**

OBJECTIVE ;-The objective is to provide basic knowledge of business ethics and values and its relevance in modern context.

Course content:-

UNIT 1: BUSINESS AND PERSONAL ETHICS

Introduction – Meaning - Scope – Types of Ethics – Characteristics – Factors influencing Business Ethics – Importance of Business Ethics - Arguments for and

against business ethics- Basics of business ethics - Corporate Social Responsibility – Issues of Management – Crisis Management

Introduction – Meaning – Emotional Honesty – Virtue of humility – Promote happiness – karma yoga – proactive – flexibility and purity of mind.

UNIT 2: ETHICS IN MANAGEMENT

Introduction – Ethics in HRM – Marketing Ethics – Ethical aspects of Financial Management - Technology Ethics and Professional ethics.

UNIT 3: ROLE OF CORPORATE CULTURE IN BUSINESS

Meaning – Functions – Impact of corporate culture – cross cultural issues in ethics

UNIT 4: CORPORATE GOVERNANCE

Meaning – scope - composition of BODs - Cadbury Committee - various committees - reports on corporate governance - scope of Corporate Governance - Benefits and Limitations of Corporate Governance with living examples.

BOOKS FOR REFERENCE

1. Murthy CSV: Business Ethics and Corporate Governance, HPH
2. Bholananth Dutta, S.K. Podder – Corporation Governance, VBH.
3. Dr. K. Nirmala, KarunakaraReaddy : Business Ethics and Corporate Governance, HPH
4. H.R.Machiraju: Corporate Governance
5. K. Venkataramana, Corporate Governance, SHBP.
6. N.M.Khandelwal : Indian Ethos and Values for Managers
7. S Prabhakaran; Business ethics and Corporate Governance
8. C.V. Baxi: Corporate Governance
9. R. R. Gaur, R. Sanghal, G. P. Bagaria; Human Values and Professional ethics
10. B O B Tricker, Corporate Governance; Principles , Policies and Practices
11. Michael, Blowfield; Corporate Responsibility
12. Andrew Crane; Business Ethics
13. Ghosh; Ethics in Management and Indian ethos.

Course Code	Duration	Course Title	L	T	P	C
BBAD15F6300	**6 weeks**	**FINAL DISSERTATION PROJECT**		**2**	**12**	**24**

Training and Placement:

Having a degree will open doors to the world of opportunities for you. But Employers are looking for much more than just a degree. They want graduates who stand out from the crowd and exhibit real life skills that can be applied to their organizations. Examples of such popular skills employers look for include:

- Willingness to learn
- Self motivation
- Team work
- Communication skills and application of these skills to real scenarios
- Requirement of gathering, design and analysis, development and testing skills
- Analytical and Technical skills
- Computer skills
- Internet searching skills
- Information consolidation and presentation skills
- Role play
- Group discussion, and so on

The REVA University therefore, has given utmost importance to develop these skills through variety of training programs and such other activities that induce the said skills among all students. A full-fledged Career Counseling, Training and Placement (CCTP) Centre headed by well experienced dynamic Trainer, Counselor and Placement Officer supported by an efficient team does handle all aspects of Internships and Placement for the students of REVA University. The prime objective of the CCTP Centre is to liaison between REVA graduating students and industries by providing a common platform where the prospective employer companies can identify suitable candidates for placement in their respective organization. The CCTP Centre organizes pre-placement training by professionals and also arranges expert talks to our students. It facilitates students to career guidance and improve their employability. In addition, CCTP Centre forms teams to perform mock interviews. It makes you to enjoy working with such teams and learn many things apart from working together in a team. It also makes you to participate in various student clubs which helps in developing team culture, variety of job skills and overall personality.

The need of the hour in the field of Business, Management, Commerce and Trade is efficient leaders of repute, who can deal the real time problems with a pinch of innovation. This kept in focus, the training and Placement cell has designed the training process, which will commence from First semester along with the curriculum. Special coaching in personality development, career building, English proficiency, reasoning, puzzles, leadership, strategic management and communication skills , team work to every student of REVA University is given with utmost care. The

process involves continuous training and monitoring the students to develop their interpersonal skills that will fetch them a job of repute in the area of his/her interest and march forward to make better career

Skill development is one of the very important activities of the University and industry relationship. A skill development center is established to organize skill and certification programmes. The students shall compulsorily complete at least two skill/ certification based programmes before the completion of the degree.

The University has collaboration with industries; corporate training organization, research institutions and government agencies like NSDC (National skill Development Corporation) to conduct certification programmes.

The various skill/certification programmes apart from the general soft skills identified are as follows:

- SAP Certification
- Big Data and Cloud computing, internet of things (IOT), ORCALE, MYSQL
- Management related programmes like ERP and Business analytics .

The University has signed MOU's with MNC companies, Research Institutions, Government agencies like NSDC (National skill Development Corporation) and Universities abroad to facilitate greater opportunities of employability, students exchange programmes for higher learning and for conducting certification programmes..

CAREER COUNSELING AND PLACEMENT

Having a degree will open doors to the world of opportunities for you. But Employers are looking for much more than just a degree. They want graduates who stand out from the crowd and exhibit real life skills that can be applied to their organizations. Examples of such popular skills employers look for include:

- Willingness to learn
- Self motivation
- Team work
- Communication skills and application of these skills to real scenarios
- Requirement of gathering, design and analysis, development and testing skills
- Analytical and Technical skills
- Computer skills
- Internet searching skills
- Information consolidation and presentation skills
- Role play
- Group discussion, and so on

REVA University therefore, has given utmost importance to develop these skills through variety of training programs and such other activities that induce the said skills among all students. A full-fledged Career Counseling and Placement division, namely Career Development Center (CDC) headed by well experienced senior Professor and Dean and supported by dynamic trainers, counselors and placement officers and other efficient supportive team does handle all aspects of Internships and placements for the students of REVA University. The prime objective of the CDC is to liaison between REVA graduating students and industries by providing a common platform where the prospective employer companies can identify suitable candidates for placement in their respective organization. The CDC organizes pre-placement training by professionals and also arranges expert talks to our students. It facilitates students to career guidance and improve their employability. In addition, CDC forms teams to perform mock interviews. It makes you to enjoy working with such teams and learn many things apart from working together in a team. It also makes you to participate in various student clubs which helps in developing team culture, variety of job skills and overall personality.

The need of the hour in the field of Commerce is efficient leaders of repute, who can deal the real time problems with a flavour of innovation. This kept in focus, the CDC has designed the training process, which will commence from second semester along with the curriculum. Special coaching in personality development, career building, English proficiency, reasoning, puzzles, leadership, and strategic management and communication skills to every student of REVA University is given with utmost care. The process involves continuous training and

monitoring the students to develop their soft skills including interpersonal skills that will fetch them a job of repute in the area of his / her interest and march forward to make better career.

The University has recognized skill development and industry relationship as its very important activities. Therefore, the University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director has been established to facilitate skill related training to REVA students and other unemployed students around REVA campus. The center conducts variety of skill development programs to students to suite to their career opportunities. Through this skill development centre the students shall compulsorily complete at least two skill / certification based programs before the completion of their degree. The University has collaborations with Industries, Corporate training organizations, research institutions and Government agencies like NSDC (National Skill Development Corporation) to conduct certification programs. REVA University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal Vikas Yojana.

The University has signed MOU's with Multi-National Companies, research institutions, Government agencies like NSDC (National Skill Development Corporation) and universities abroad to facilitate greater opportunities of employability, students' exchange programs for higher learning and for conducting certification programs.

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FACULTY MEMBERS

SL. NO.	Name of the Faculty	Designation
1	Dr. M M BAGALI	Professor & Director
2	Dr. CHITHAMBAR GUPTA V	Associate Professor
3	Dr. SHINU ABHI	Head-REVA Academy for Corporate Excellence
4	Prof. B DIWAKAR NAIDU	Associate Professor
5	Dr. SHALINI CHANDRA	Associate Professor
6	Dr. B R SANTOSH	Associate Professor
7	Prof. SHIVASHARANA	Associate Professor
8	Prof. H N SHYLAJA	Assistant Professor
9	Prof. SANDHYA.S	Assistant Professor
10	Dr. RUCHI GUPTA	Assistant Professor
11	Prof. MANJUNATH V S	Assistant Professor
12	Prof. ANSHU RANI	Assistant Professor
13	Prof. NAGENDRA S M	Assistant Professor
14	Prof. NAVEEN KUMAR .P	Assistant Professor
15	Prof. NITU GHOSH	Assistant Professor
16	Prof. PILLAVENKATSWAMY	Assistant Professor
17	Prof. NIRANJAN .K	Assistant Professor
18	Prof. ANITHA KUMARI B	Assistant Professor
19	Dr. URMILA JAGADEESWARI ITAM	Assistant Professor
20	Prof. SIJU C NAIR	Assistant Professor

21	Prof. SUDHAKARA M R	Assistant Professor
22	Prof. GEETHA S R	Assistant Professor
23	Prof. AISHWARYA.H	Assistant Professor
24	Prof. KUMUDA B S	Assistant Professor
25	Prof. KAVYA S	Assistant Professor
26	Prof. ANUJ VARMA	Assistant Professor
27	Prof. MEENAKSHI VARMA	Assistant Professor

DO'S AND DON'TS

DO'S

1. Maintain discipline and respect the rules and regulations of the university
2. Be regular and punctual to classes
3. Study regularly and submit assignments on time
4. Be respectful to your Teaches/friends and hostel staff/management.
5. Read the notice board (both at your college and the hostel) regularly.
6. Utilize your Personal Computer for educational purpose only.
7. Follow the code of conduct.
8. Visit Health Center on the campus whenever you are unwell.
9. Be security conscious and take care of your valuables especially Cash, Mobile Phones,
   Laptop and other valuables.
10. Carry your valuables along with you whenever you proceed on leave/vacation.
11. Use electric appliances, lights and water optimally.
12. Keep the campus clean and hygienic.
13. Use decent dressing.

DON'TS

1. Ragging inside / outside the campus.
2. Possession of Fire arms and daggers etc.
3. Use of Alcohols, Toxic drugs, sheesha, gutkha and hashish/heroin etc.

4. Use of Crackers, explosives and ammunition etc.
5. Smoking and keeping any kind of such items.
6. Misusing college & hostel premises/facilities for activities other than studies.
7. Playing loud music in the room which may disturb studies of colleagues / neighbors.
8. Making noise and raising slogans.
9. Keeping electrical appliances, other than authorized ones.
10. Involvement in politics, ethnic, sectarian and other undesirable activities.
11. Proxy in any manner.
12. Use of mobiles in the academic areas.

Note: 1. Rules are revised / reviewed as and when required.

2. Healthy suggestions are welcome for betterment of Institution

REVA UNIVERSITY
Bengaluru, India

SCHOOL OF ARTS AND HUMANITIES

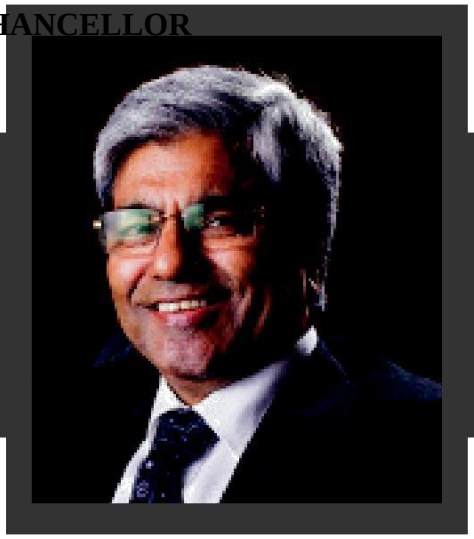
BA (JEP) - HAND BOOK – 2017

Rukmini Knowledge Park
Kattigenahalli, Yelahanka, Bangalore-560 064, INDIA
www.reva.edu.in
Phone No: +91-080-46966966, +91-9021190211

Rukmini Educational Charitable Trust

A Unit of DivyaSree

MESSAGE FROM THE HON'BLE CHANCELLOR



Dr. P. Shyama Raju
Chancellor
REVA University

Education during recent years has witnessed a great transformation. Today's society, termed as "Knowledge Society" has brought about unprecedented economic and social growth. This has propelled universities across the world to devise new ways of tapping human potential for different competencies and building a vibrant society with a win-win situation for all.

REVA University has seen the light of the day to imbibe this character of paradigm shift in academic pursuits to contribute to the knowledge society. REVA works hard to bring in you an exciting and rewarding educational experience, to discover new interests and to develop your career prospects. You will benefit from a unique approach to student-centered outcome based learning through group work and individual study tackling real world challenges under the guidance of committed teachers, researchers and well experienced practitioners.

REVA has excellent learning facilities including custom built teaching facilities designed specifically to emulate working conditions, air-conditioned library opened for your studies from early morning till midnight and facilities for variety of sports and cultural activities.

Our faculties have introduced socially relevant and market driven engineering courses after studying the requirements of industries and other sectors of employment in detail and consulting entrepreneurs, experts in different areas of engineering and industries and other stake-holders. I am glad that the Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) adopted by the University will facilitate learning environment under continuous guidance and monitoring by the faculty members and equip you with competent skills to opt for different job prospects across the global. Our most modernised Career Development Centre not only helps you in inculcating communication proficiency skills in respective areas, but also facilitate opportunities for campus selection by top notched companies and Corporates.

I hope that the present scheme of instructions, continuous periodic progress assessments, course curriculum of B A Programs and other information provided in this hand book will guide you to choose appropriate courses of study and move ahead in the right direction in your chosen area of study. I hope you will enjoy and experience the curriculum, the student-centered teaching and learning ambience in developing your personality to become successful professionals, entrepreneurs and proud citizens of the country.

I wish you every success in your career.

MESSAGE FROM THE VICE CHANCELLOR

The curriculum of an institution of higher learning is a living entity. It evolves with time; it reflects the ever changing needs of the society and keeps pace with the growing talent of the students and the faculty. The curriculum of the B.A. program of REVA University is no exception.

The curriculum has been designed in such a way that the teacher enjoys freedom to expand it in any direction she/he feels appropriate and incorporates the latest knowledge and stimulates the creative minds of the students. The BA curriculum is designed to strengthen the skills in the critical analysis of literature and provide a broad understanding of literary traditions. Our courses are taught by accomplished instructors who are dedicated to your success. The present curriculum is contemporary because it is culmination of efforts of large number of faculty members, experts from industries and research level organizations.

I am very sure that all students of this program will enjoy this curriculum and take fullest advantage to expose themselves to fundamentals and applications. Also, imbibe all attributes that are required to term them as Global Engineers. The innovativeness and creativity being introduced should be explored fully by our students.

The flexibility in the curriculum permits staff and students to incorporate changes in terms of addition of new courses and deletion of irrelevant courses keeping the rapid advances in the technology into consideration.

I also record my personal gratitude to Chancellor and members of Academic Council who have lent every bit of their wisdom to make this curriculum truly superior.

Dr. S.Y. Kulkarni

Vice Chancellor

PREFACE

"For last year's words belong to last year's language/ And next year's words await another voice/ and to make an end is to make a beginning." (T.S. Eliot)

A hearty welcome to this 'new beginning'!

The School of Arts and Humanities at REVA University, one of the most sought after schools, has cut a niche for itself by building a prominent academic record. The School offers Undergraduate, Postgraduate, and Ph.D programs to scholars from all over the world, initiating in them the continuous urge to delve into the vast arena of creative and critical thinking.

The programs of study offered foster cultural, social and political understanding and hone the creative abilities of the scholars. Here, students not only develop knowledge in their area of specialization but also acquire practical skills useful for their future careers. We take great pride in our students who have been performing exceedingly well in the field of academics and co-curricular activities and have been bringing laurels to the University every year.

We are at a wonderful phase when the domain of Arts and Humanities all over the world is taking very meaningful and innovative turns. With various new career opportunities and specializations coming to the forefront, young enthusiasts have the boon of limitless career choices.

We, at REVA University, deem it fit to channelize the potential of the young minds towards newer horizons. With the expertise of the highly qualified and committed teaching faculty of the School, we continuously strive to provide the best practical knowledge to our students.

This academic year, keeping in mind our trend, our goals are set very high. Focusing primarily on Research and Development, the School will initiate every scholar under our wings to take a step forward in their specialized areas by engaging in collaborative and individual research projects. Research collaboration with other prestigious organizations is also in the pipeline. Many external subject specialists from the teaching fraternity as well as industry will bring in their expertise to our scholars, providing them with current scenarios of the entire world.

I invite you to participate in the many opportunities offered by the School of Arts and Humanities and join our hands to strengthen our participation in the international global Humanities forum.

The curriculum caters to and has relevance to Local, Regional, National, and Global developmental needs.

Maximum number of courses are integrated with cross-cutting issues with relevant to professional ethics, gender, human values, Environment & Sustainability.

With Best Wishes

Dr. Payel Dutta Chowdhury
Director
School of Arts & Humanities

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RUKMINI EDUCATIONAL CHARITABLE TRUST

It was the dream of late Smt. Rukmini Shyama Raju to impart education to millions of underprivileged children as she knew the importance of education in the contemporary society. The dream of Smt. Rukmini Shyama Raju came true with the establishment of Rukmini Educational Charitable Trust (RECT), in the year 2002. **Rukmini Educational Charitable Trust** (RECT) is a Public Charitable Trust, set up in 2002 with the objective of promoting, establishing and conducting academic activities in the fields of Arts, Commerce, Education, Engineering, Environmental Science, Management and Science & Technology, among others. In furtherance of these objectives, the Trust has set up the REVA Group of Educational Institutions comprising of REVA Institute of Technology & Management (RITM), REVA Institute of Science and Management (RISM), REVA Institute of Management Studies (RIMS), REVA Institute of Education (RIE), REVA First Grade College (RFGC), REVA Degree College (Evening), REVA Independent PU College at Kattigenahalli, Ganganagar and Sanjaynagar and now REVA University. Through these institutions, the Trust seeks to fulfill its vision of providing world class education and create abundant opportunities for the youth of this nation to excel in the areas of Engineering, Architecture, Commerce, Management, Education, Law and Arts, and Science & Technology.

Every great human enterprise is powered by the vision of one or more extraordinary individuals and is sustained by the people who derive their motivation from the founders. The Chairman of the Trust is Dr. P. Shyama Raju, a developer and builder of repute, a captain of the industry in his own right and the Chairman and Managing Director of the DivyaSree Group of companies. The idea of creating these top notch educational institutions was born of the philanthropic instincts of Dr. P. Shyama Raju to do public good, quite in keeping with his support to other socially relevant charities such as maintaining the Richmond road park, building and donating a police station, gifting assets to organizations providing accident and trauma care, to name a few.

The Rukmini Educational Charitable Trust drives with the main aim to help students who are in pursuit of quality education for life. REVA is today a family of ten institutions providing education from PU to Post Graduation and Research leading to M. Phil and PhD degrees. REVA has well qualified experienced teaching faculty of whom majority are doctorates. The faculty is supported by committed administrative and technical staff. Over 11,000 students

study various courses across REVA's three campuses equipped with exemplary state-of-the-art infrastructure and conductive environment for the knowledge driven community.

ABOUT REVA UNIVERSITY

REVA University has been established under the REVA University Act, 2012 of Government of Karnataka and notified in Karnataka State Gazette No. 80 dated 27thFebruary, 2013. The University is empowered by UGC to award degrees any branch of knowledge under Sec.22 of the UGC Act. The University is a Member of Association of Indian Universities, New Delhi. The main objective of the University is to prepare students with knowledge, wisdom and patriotism to face the global challenges and become the top leaders of the country and the globe in different fields.

REVA University located in between Kempegowda International Airport and Bangalore city, has a sprawling green campus spread over 45 acres of land and equipped with state-of-the-art infrastructure that provide conducive environment for higher learning and research. The REVA campus has well equipped laboratories, custom-built teaching facilities, fully air-conditioned library and central computer centre facilitating conducive environment for studies, research and overall personality development. The unique feature of REVA campus is the largest residential facility for students, faculty members and supportive staff.

The University is presently offering 23 Post Graduate Degree programs, 20 Degree and PG Degree programs in various branches of studies and has 12000+ students studying in various branches of knowledge at graduate and post graduate level and 302 Scholars pursuing research leading to PhD in 18 disciplines. It has 800+ well qualified, experienced and committed faculty members of whom majority are doctorates in their respective areas and most of them are guiding students pursuing research leading to PhD.

The programs being offered by the REVA University are well planned and designed after detailed study with emphasis on knowledge assimilation, applications, global job market and their social relevance. Highly qualified, experienced faculty and scholars from reputed universities / institutions, experts from industries and business sectors have contributed in preparing the scheme of instruction and detailed curricula for this program. Greater emphasis on practice in respective areas and skill development to suit to respective job environment has been given while designing the curricula. The Choice Based Credit System and Continuous Assessment Graded Pattern (CBCS – CAGP) of education has been introduced in all programs to facilitate students to opt for subjects of their choice in addition to the core subjects of the study and prepare them with needed skills. The system also allows students to move forward under the fast track for those who have the capabilities to surpass others. These programs are taught by well experienced qualified faculty supported by the experts from industries, business sectors and such other organizations. REVA University has also initiated many supportive measures such as bridge courses, special coaching, remedial classes, etc., for slow learners so as to give them the needed input and build in them confidence and courage to move forward and accomplish success in their career. The University has also entered into MOUs with many industries, business firms and other institutions seeking their help in imparting quality education through practice, internship and also assisting students' placements.

REVA University recognizing the fact that research, development and innovation are the important functions of any university has established an independent Research and Innovation division headed by a senior professor as Dean of Research and Innovation. This division facilitates all faculty members and research scholars to undertake innovative research projects in engineering, science & technology and other areas of study. The interdisciplinary-multidisciplinary research is given the top most priority. The division continuously liaisons between various funding agencies, R&D Institutions, Industries and faculty members of REVA University to facilitate undertaking innovative projects. It encourages student research projects by forming different research groups under the guidance of senior faculty members.

The REVA University has also given utmost importance to develop the much required skills through variety of training programs, industrial practice, case studies and such other activities that induce the said skills among all students. A full-fledged Career Counseling and Placement (CCP) with world class infrastructure, headed by a dynamic experienced Professor & Dean, and

supported by well experienced Trainers, Counselors and Placement Officers.

The University also has University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director facilitating skill related training to REVA students and other unemployed students. REVA University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal Vikas Yojana. The Centre conducts several add-on courses in challenging areas of development. It is always active in facilitating student's variety of Skill Development Training programs.

The University has collaborations with industries, universities abroad, research institutions, corporate training organizations, and Government agencies such as Florida International University, Okalahoma State University, Western Connecticut University, University of Alabama, Huntsville, Oracle India Ltd, Texas Instruments, Nokia University Relations, EMC^2, VMware, SAP, Apollo etc, to facilitate student exchange and teacher–scholar exchange programs and conduct training programs. These collaborations with foreign universities also facilitates students to study some of the programs partly in REVA University and partly in foreign universities, viz, M.S in Computer Science one year in REVA University and one year in the University of Alabama, Huntsville, USA.

The University has also given greater importance to quality in education, research, administration and all activities of the university. Therefore, it has established an independent Internal Quality division

headed by a senior Professor as Dean of Internal Quality. The division works on planning, designing and developing different quality tools, implementing them and monitoring the implementation of these quality tools. It concentrates on training entire faculty to adopt the new tools and implement their use. The division further works on introducing various examination and administrative reforms.

To motivate the youth and transform them to become innovative entrepreneurs, successful leaders of tomorrow and committed citizens of the country, REVA organizes interaction between students and successful industrialists, entrepreneurs, scientists and such others from time to time. As a part of this exercise great personalities such as Bharat Ratna Prof. C. N. R.

Rao, a renowned Scientist, Dr. N R Narayana Murthy, Founder and Chairman and Mentor of Infosys, Dr. K Kasturirangan, Former Chairman ISRO, Member of Planning Commission, Government of India, Dr. Balaram, Former Director IISc., and noted Scientist, Dr. V S Ramamurthy, Former Secretary, DST, Government of India, Dr. V K Aatre, noted Scientist and former head of the DRDO and Scientific Advisor to the Ministry of Defence Dr. Sathish Reddy, Scientific Advisor, Ministry of Defence, New Delhi and many others have accepted our invitation and blessed our students and faculty members by their inspiring addresses and interaction.

As a part of the effort in motivating and inspiring youth of today, REVA University also has instituted awards and prizes to recognize the services of teachers, researchers, scientists, entrepreneurs, social workers and such others who have contributed richly for the development of the society and progress of the country. One of such award instituted by REVA University is 'Life Time Achievement Award' to be awarded to successful personalities who have made mark in their field of work. This award is presented on occasion of the "Founders' Day Celebration" of REVA University in presence of dignitaries, faculty members and students gathering and the first "REVA Life Time Achievement Award" for the year 2015 has been awarded to Shri. Kiran Kumar, Chairman ISRO on the occasion of Founder's Day Celebration, 6th January, 2016 and the second "REVA Life Time Achievement Award" for the year 2016 has been awarded to Shri. Shekhar Gupta, renowned Journalist and Padma Shree Shri Ignace Tirkey, Former Indian Hockey Player & Captain on the occasion of Founder's Day Celebration, 6th January, 2017.

REVA University is keen in promoting sports and cultural activities to inculcate cultural, traditional, ethical and moral values among our students. It has well planned sports facility with cricket ground, running track & variety of indoor and outdoor sports activities, facilities for cultural programs. Recently a music hall with all necessary gadgets / instruments has been established to promote cultural interest among students. REVA organises various cultural programs throughout the academic year. During such cultural events the students are given opportunities to unfold their hidden talents and motivate them to contribute innovative ideas for the progress of the society. One of such cultural events is REVAMP conducted every year. The event not only gives opportunities to students of REVA but also students of other Universities and Colleges. During three days of this mega event students participate in debates, quizzes, group discussion, seminars, exhibitions and variety of cultural events. Another important event is 'Shubha Vidaaya' - Graduation Day for the final year students of all the programs, wherein,

the outgoing students are felicitated and are addressed by eminent personalities to take their future career in a right spirit, to be the good citizens and dedicate themselves to serve the society and make a mark in their respective spheres of activities. During this occasion, the students who have achieved top ranks and won medals and prizes in academic, cultural and sports activities are also recognised by distributing awards and prizes. The founders have also instituted medals and prizes for sports achievers every year. The physical education department conducts regular yoga classes everyday to students, faculty members, administrative staff and their family members and organises yoga camps for villagers around.

Recognizing the fast growth of the university and its quality in imparting higher education, the BERG (Business Excellence and Research Group), Singapore has awarded BERG Education Award 2015 to REVA University under Private Universities category. The University has also been honored with many more such honors and recognitions.

SCHOOL OF ARTS AND HUMANITIES

The Master's and the Bachelor's Degree offered by the school aims to create graduates who have command over the respective subjects, and who can interact with contemporary thought and pursue research in their respective specializations. The core courses in the program deepen student's journalistic and linguistic skills. These courses raise awareness of value of corpus in investigating language and expose them to different research methodology. It also engages the learners in indigenous, innovative and global research and contributes to the enrichment and dissemination of knowledge in Media industry.

Vision

Providing its students the highest quality of preparation in an atmosphere that promotes intellectual vigor, critical inquiry, citizenship and creative decision-making requisite for personal growth and professional success.

Mission

- To produce individuals who are personally, intellectually and professionally competent and are aware of the human potential and achievement.
- To instill in students a love of learning that will make them life-long learners.
- To produce leaders who are sensitive to social, ethical and environmental concerns.

Program Educational Objectives

After few years of graduation, the graduates of **B.A (Political Science, Economics and Journalism)** will be able to:

PEO-1: Pursue Higher Education and carry out research in Universities at national and international level.
PEO-2: Occupy a position and work as a team member in Public, Private, Corporate and Government Sector as techno managers, academicians, administrators or entrepreneurs, investigative agencies with effective Communication and moral principles.
PEO-3: Start own enterprise and communicate with customers effectively and adopt lifelong learning Skills for magnifying Business.

Program Specific Outcomes

On successful completion of the program, the graduates of **B.A (Political Science, Economics and Journalism)** program will be able to:

1. Demonstrate the Knowledge in Political Science, Economics and Journalism.
2. Analyze and report the problems in political science by understanding the economical situation of the country.
3. Use different techniques to gather information inJournalism and report effectively.

Program Outcomes

On successful completion of the program, the graduates of **B.A (Political Science, Economics and Journalism)** program will be able to:

- **PO 1: Disciplinary knowledge**: Demonstrate comprehensive knowledge and in understanding Political, Journalism and Economics study.
- **PO 2: Reasoning**: Analyze, interpret and draw conclusions from evidence and experiences from an open-minded and reasoned perspective.
- **PO 3: Problem solving**: Extrapolate and apply their competencies to solve different kinds of non-familiar problems and apply one's learning to real life situations using curriculum content knowledge.
- **PO 4: Environment and Sustainability**: Understand the issues of environmental contexts and **sustainable development**.
- **PO 5: Research-related skills**: Recognize cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyze, interpret and draw

conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation

- **PO 6: Ethics**: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
- **PO 7: Cooperation/Team work**: Work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.
- **PO 8: Communication Skills**: Express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups
- **PO 9: Self-directed and Life-long Learning**: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

Seven Deadly Sins

"Wealth without work
Pleasure without conscience
Science without humanity
Knowledge without character
Politics without principle
Commerce without morality
Worship without sacrifice.**"**

— Mahatma Gandhi

Advisory Board

SL No.	Name
1.	Dr. S Ramaswamy, Professor[Retd] Bangalore University, Bangalore
2.	Dr. V. S. Sreedhara, Professor of English , NLSUI, Bangalore
3	Dr. Shivalinga Swamy, Associate Professor and HoD of English, Tumkur University, Tumkur
4.	Dr. Etienne Rassendren, Professor, Dept of English, St Joseph's College[Auto], Bangalore
5	Dr. C. P. Ravichandra, Professor, Dept of English, Mysore University, Mysore
6	Dr. Rajendra Chenni, Professor. Dept of English, Kuvempu University, Shimogga
7	Prof. S. Narayanan, Professor [Retd], Kongadiappa College, Doddabalapura
8	Shri. Shirahatti - Former Doordarshan Kendra Director
9	Shri Mohamad Aslam - Vice President Maldives broadcasting Association
10	Prof. Usharani - Professor, Department of Mass Communication
11	Mr. Anantha Subramanya- Photo Journalist, Bangalore Mirror
12	Dr. Abbas- Tehran University, Tehran, Iran
13	T S Nagabharana Director (National Awardee)
14	Mr. Yash Chawla, Chief, Sports Bereau, NDTV

"Education is the manifestation of the perfection already in man"

- Swami Vivekananda

The ladder of success is best climbed by stepping on the rungs of opportunity.

- Ayn Rand

I think of science fiction as being part of the great river of imaginative fiction that has flowed through English literature, probably for 400 or 500 years, well predating modern science.

- J. G. Ballard

Literature adds to reality, it does not simply describe it. It enriches the necessary competencies that daily life requires and provides; and in this respect, it irrigates the deserts that our lives have already become.

- C. S. Lewis

Literature is the art of discovering something extraordinary about ordinary people, and saying with ordinary words something extraordinary.

- Boris Pasternak

CBCS (CHOICE BASED CREDIT SYSTEM) AND CAGP (CONTINUOUS ASSESSMENT AND GRADING PATTERN) OF EDUCATION AND ITS ADVANTAGES

CBCS is a proven, advanced mode of learning in higher education. It facilitates students to have freedom in making their own choices for acquiring a Degree / Master's Degree program. It is more focused towards the student's choice in providing a wide range of Units available in a single campus across various disciplines offered by experts in the subjects. It leads to quality education with active teacher-student participation.

Studying under CBCS has following advantages:

- Students may undergo training in cross-disciplinary and multi-disciplinary subjects and acquire more focused and preferred knowledge.
- Students may get more skills from other subject(s) which are required for the career path in addition to their regular subject knowledge.
- Students may get ample opportunities to use the laboratories and gain practical exposure to the much needed Units available in other departments/schools for want of scientific inputs.
- Courses are conducted by subject experts identified on the basis of their experiences. Courses taught by such experts may provide in-depth information and clear understanding of the Units.
- Students may get an opportunity to study courses with other students of different programs and exchange their views and knowledge in a common class room.
- CBCS provides a cross-cultural learning environment.
- Students may benefit much from selecting the right options to successfully face the public service examinations like UPSC, KPSC, IES wherein the knowledge of additional subjects become mandatory for general or optional papers.
- Students are exposed to the culture of universal brotherhood during their campus life.
- Students are allowed to practice various methods of learning a subject.

Summary of REVA University Regulations for Choice Based Credit System (CBCS) and Continuous Assessment Grading Pattern (CAGP) for Three Years Graduate Degree Programs

1. **Teaching and Learning Process:**

The teaching & learning process under CBCS – CAGP of education in each course of study will have three components, namely**:**

(i) L= Lecture (ii) T= Tutorial (iii) P=Practice; where:

L stands for **Lecture** session consisting of classroom instruction.

T stands for **Tutorial** session consisting participatory discussion / self study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes.

P stands for **Practice** session and it consists of Hands on Experience / Laboratory Experiments / Field Studies / Case Studies that equip students to acquire the much required skill component.

2. **Courses of Study and Credits**

a. The study of various subjects in BBA degree program is grouped under various courses. Each of these courses carries credits which are based on the number of hours of teaching and learning.

b. In terms of credits, every **one hour session of L amounts to 1 credit per Semester** and a minimum of **two hour session of T or P amounts to 1 credit per Semester or a three hour session of T / P amounts to 2 credits** over a period of one Semester of 16 weeks for teaching-learning process.

c. The total duration of a semester is 20 weeks inclusive of semester-end examination.

d. **A course shall have either or all the four components.** That means a course may have only lecture component, or only practical component or combination of any two or all the three components.

e. The total credits earned by a student at the end of the semester upon successfully completing the course are L + T + P. **The credit pattern of the course is indicated as L: T: P**

Different C**ourses of Study** are labeled and defined as follows:

a. Core Course:

A course which should compulsorily be studied by a candidate as a core-requirement is termed as a Core course. The CORE courses of Study are of THREE types, viz – (i) Foundation Course, (ii) Hard Core Course, and (iii) Soft Core Course.

b. Foundation Course (FC):

The foundation Course is a core course which should be completed successfully as a part of graduate degree program irrespective of the branch of study. These would include basic courses in Languages, courses of study prescribed by the University.

c. Hard Core Course (HC):

The **Hard Core Course** is a Core Course in the main branch of study and related branch(es) of study, if any that the candidates have to complete compulsorily.

d. Soft Core Course (SC):

A Core course may be a **Soft Core** if there is a choice or an option for the candidate to choose a course from a pool of courses from the main branch of study or from a sister/related branch of study which supports the main branch of study.

e. O**pen Elective Course:**

An elective course chosen generally from other discipline / subject, with an intention to seek exposure to the basics of subjects other than the main discipline the student is studying is called an O**pen Elective Course.**

f. Project Work / Dissertation:

Project work / Dissertation work is a special course involving application of knowledge in solving / analyzing /exploring a real life situation / difficult problem. A project work carrying **FOUR or SIX** credits is called **Minor Project** work / **Dissertation.** A project work of **EIGHT, TEN, TWELVE or SIXTEEN** credits is called **Major Project** work /

Dissertation. **A Minor Project work may be a hard core or a Soft Core as decided by the BOS / concerned. But the Major Project shall be Hard Core.**

3. Scheme, Duration and Medium of Instructions:

3.1. B.A in Journalism, English & Psychology (BA – JEP) Degree program is of 6 semesters - 3 years duration. A candidate can avail a maximum of 12 semesters - 6 years as per double duration norm, in one stretch to complete the Three Year Degree, including blank semesters, if any. Whenever a candidate opts for blank semester, he/she has to study the prevailing courses offered by the School when he/she resumes his/her studies.

3.2. The medium of instruction shall be English.

4. Credits and Credit Distribution

4.1. A candidate has to earn 144 credits for successful completion of Three Year BA - JEP degree with the distribution of credits for different courses as decided by the Board of Studies.

4.2. The concerned BOS based on the credits distribution pattern given above shall prescribe the credits to various types of courses and shall assign title to every course including project work, practical work, field work, self study elective, as **Foundation Course(FC), Hard Core(HC) or Soft Core(SC) or Open Elective(OE)**.

4.3. A candidate can enroll for a maximum of 30 credits and a minimum of 20 credits per Semester. However he / she may not successfully earn a maximum of 30 credits per semester. This maximum of 30 credits does not include the credits of courses carried forward by a candidate.

4.4. Only such full time candidates who register for a minimum prescribed number of credits in each semester from I semester to VI semester and complete successfully 144 credits (150 credits in case of Honors program) in 6 successive semesters shall be considered for declaration of Ranks, Medals, Prizes and are eligible to apply for Student Fellowship, Scholarship, Free ships, and such other rewards / advantages which

could be applicable for all full time students and for hostel facilities.

5. Add- on Proficiency Certification:

To acquire **Add on Proficiency Certification** a candidate can opt to complete a minimum of 4 extra credits either in the same discipline /subject or in different discipline / subject in excess to 144 credits required for BA - JEP degree program.

6. Add on Proficiency Diploma:

6.1. To acquire **Add on Proficiency Diploma,** a candidate can opt to complete a minimum of 18 extra credits either in the same discipline /subject or in different discipline / subject in excess to 144 credits required for BA - JEP Degree program.

6.2. The A**dd on Proficiency Certification / Diploma** so issued to the candidate contains the courses studied and grades earned.

7. Scheme of Assessment & Evaluation

7.1. The Scheme of Assessment and Evaluation will have two parts, namely;

i. Internal Assessment (IA); and
ii. Semester End Examination (SEE)

7.2. Assessment and Evaluation of each Course shall be for 100 marks. The Internal Assessment and Semester End Examination of BA - JEP degree programs shall carry 50 marks each (i.e., 50 marks internal assessment 50 marks Semester End Examination).

7. 3. The 50 marks of Internal Assessment (IA) shall comprise of:

Internal Test	= 30 marks
Assignments	= 10 marks
Seminars	= 10 marks

7.4. There shall be three internal tests conducted as per the schedule given below. The students haveto attend all the three tests compulsorily.

- 1st test for 15 marks at the end of 5th week of the beginning of the Semester;
- 2nd test for 15 marks at the end of the 10th week of the beginning of the Semester; and
- 3rd test for 15 marks at the end of the 15th week of the beginning of the Semester.

7.5. The coverage of syllabus for the said three tests shall be as under:

- For the 1st test syllabus shall be 1st unit of the course;
- For the 2nd test it shall be 2nd unit and 1st half of the 3rd unit;
- For the 3rd test the syllabus will be 2nd half of the 3rd unit and complete 4th unit.

7.6. Out of 3 tests, the highest marks scored in **two tests** are automatically considered while assessing the performance of the students.

7.7. There shall be two Assignments and two Seminars each carrying 5 marks. Hence two assignments carry 10 marks and two seminars carry 10 marks as stated at Sl.No. 7.3 above.

7.8. The Semester End Examination (SEE) for 50 marks shall be held during 18th and 19th week of the beginning of the semester and **the syllabus for the semester end examination shall be entire 4 units**.

7.9. The **duration of the internal test shall be 75 minutes and for semester end examination the duration shall be 3 hours.**

7.10. The Summary of Internal Assessment (IA) and Evaluation in a given semester is as provided in the following table:

Summary of Internal Assessment and Evaluation Schedule

Type of Assessment	Period	Syllabus	Marks	Activity
First Test	2nd half of 5th Week	1st Unit	15	Consolidation of 1st Unit
Allocation of Topics for Assignments	6th Week	First Unit and 1st half of second unit		Instructional process and Continuous Assessment
Submission of Assignments	7th Week	First Unit and 1st half of second unit	5	Instructional process and Continuous Assessment
Seminars	8th Week	First unit and 1st half of second unit	5	Instructional process and Continuous Assessment
Second Test	2nd half of 10th Week	Second unit and 1st half of third unit	15	Consolidation of 2nd and 3rd Unit
Allocation of	11th	2nd half of		Instructional

Topic for 2nd Assignment	Week	second unit and 3rd Unit		process and Continuous Assessment
Submission of Assignments	12th Week	2nd half of second unit and 3rd Unit	5	Instructional process and Continuous Assessment
Seminars	13th Week	2nd half of second unit and 3rd Unit	5	Instructional process and Continuous Assessment
Third Test	2nd half of 15th Week	Second half of third unit and complete 4th Unit	15	Consolidation of 2nd half of 3rd Unit and entire 4th Unit
Semester End Practical Examination	16th Week	Entire syllabus	50	Conduct of Semester - end Practical Exams
Preparation for Semester– End Exam	16th & 17th Week	Entire Syllabus		Revision and preparation for semester–end exam
Semester End Theory Examination	18th Week & 19th Week	Entire Syllabus	50	Evaluation and Tabulation
	End of 20th Week			Notification of Final Grades

Note: 1. *Examination and Evaluation shall take place concurrently and Final Grades shall be announced latest by 5 days after completion of the examination.*

2. *Practical examination wherever applicable shall be conducted after 3rd test and before semester end examination. The calendar of practical examination shall be decided by the respective School Boards and communicated well in advance to the Registrar (Evaluation) who will notify the same immediately*

8.0. Assessment of Performance in Practicals

8.1. The performance in the practice tasks / experiments shall be assessed on the basis of:

a) Knowledge of relevant processes;

b) Skills and operations involved;

c) Results / products including calculation and reporting.

8.2 The 50 marks meant for continuous assessment of the performance in carrying out practical shall further be allocated as under:

i	Conduction of regular practical / experiments throughout the semester	20 marks
ii	Maintenance of lab records	10 marks
iii	Performance of mid-term test (to be conducted while conducting second test for theory courses); the performance assessments of the mid-term test includes performance in the conduction of experiment and write up about the experiment.	20 marks
	Total	**50 marks**

8.3. The 50 marks meant for Semester End Examination (SEE), shall be allocated as under:

i	Conduction of semester end practical examination	30 marks
ii	Write up about the experiment / practical conducted	10 marks
iii	Viva Voce	10 marks
	Total	**50 marks**

8.4. The duration for semester-end practical examination shall be decided by the concerned School Board.

8.4 Evaluation of Minor Project / Major Project / Dissertation:

Right from the initial stage of defining the problem, the candidate has to submit the progress reports periodically and also present his/her progress in the form of seminars in addition to the regular discussion with the supervisor. At the end of the semester, the candidate has to submit final report of the project / dissertation, as the case may be, for final evaluation. The components of evaluation are as follows:

i	Periodic Progress and Progress Reports (25%)
ii	Results of Work and Draft Report (25%)
iii	Final Evaluation and Viva-Voce (50%). Evaluation of the report is for 30% and the Viva-Voce examination is for 20%.

9. Provision for Appeal

9.1. If a candidate is not satisfied with the evaluation of IA components, he/she can approach the grievance cell with the written submission together with all facts, the assignments, test papers etc, which were evaluated. He/she can do so before the commencement of concerned semester-end examination. The grievance cell is empowered to revise the marks if the case is genuine and is also empowered to levy penalty as prescribed by the university on the candidate if his/her submission is found to be baseless and unduly motivated. This cell may recommend taking disciplinary/corrective action on an evaluator if he/she is found guilty. The decision taken by the grievance cell is final.

9.2. For every program there will be one grievance cell. The composition of the grievance cell is as follows:-

i. The Registrar (Evaluation) - Ex-officio Chairman / Convener

ii. One Senior Faculty Member (other than those concerned with the evaluation of the course concerned) drawn from the school / department/discipline and/or from the sister schools / departments/sister disciplines – Member.

iii. One Senior Faculty Members / Subject Experts drawn from outside the University school / department – Member.

10. Eligibility to Appear Semester End Examination

Only those students who fulfil a minimum of 75% attendance in aggregate of all the courses including practical courses / field visits etc, as part of the course(s) shall be eligible to appear for Semester End examination.

11. Requirements to Pass the Semester and to Carry Forward the Failed Subjects / Courses:

11.1. Requirements to Pass a Course

A candidate's performance will be in terms of scores, and the sum of Internal Assessment and Semester End examination will be for a maximum of 100 marks (i. e, 50 marks of IA and 50 marks of SEE) and have to secure a minimum of 40% to declare pass in a given course. However, a candidate has to secure a minimum of 25% (12 marks) in Semester End Examination which is compulsory.

11.2. Requirement to pass the semester:

To pass the semester, a candidate has to secure minimum of 40% marks in each subject / course of study prescribed in that semester.

11.3 Provision to Carry Forward the Failed Subjects / Courses:

A student who has failed in a given number of courses in odd and even semesters shall move to next semester of immediate succeeding year and final year of the study. However, he / she shall have to clear all courses of all semesters within the double duration, i. e., within six years of admission of the first semester failing which the student has to re-register to the entire program.

11.4 Re-Registration and Re-Admission:

a) In case a candidate's class attendance in aggregate of all courses in a semester is less than 75% or as stipulated by the University, such a candidate is considered as dropped the semester and is not allowed to appear for end semester examination and he / she shall have to seek re-admission to that semester during subsequent semester / year within a stipulated period.

b) In such a case where in a candidate drops all the courses in semester due to personal reasons, it is considered that the candidate has dropped the semester and he / she shall seek re-admission to such dropped semester.

12. Attendance Requirement:

12.1 All students must attend every lecture, tutorial and practical classes.

12.2 In case a student is on approved leave of absence (e g:- representing the university in sports, games or athletics, placement activities, NCC, NSS activities and such others) and / or any other such contingencies like medical emergencies, the attendance requirement shall be minimum of 75% of the classes taught.

12.3 Any student with less than 75% of attendance in aggregate of all the courses including practical courses / field visits etc, during a semester shall not be permitted to appear to the end semester examination and such student shall seek re-admission as provided above.

12.4 Teachers offering the courses will place the above details in the School Board meeting during the last week of the semester, before the commencement of examination, and subsequently a notification pertaining to the above will be brought out by the Director of the School before the commencement of examination. A copy of this notification shall also be sent to the office of the Registrar & Registrar (Evaluation).

13. Grade Card and Grade Point:

a. **Provisional Grade Card**: The tentative / provisional Grade Card will be issued by the Registrar (Evaluation) at the end of every semester indicating the courses completed successfully. The provisional grade card provides **Semester Grade Point Average** (SGPA).

b. **Final Grade Card:** Upon successful completion of BA - JEP Degree a Final Grade card consisting of grades of all courses successfully completed by the candidate will be issued by the Registrar (Evaluation).

c. **The Grade and the Grade Point:** The Grade and the Grade Point earned by the candidate in the subject will be as given below:

Marks P	Grade G	Grade Point (GP=V x G)	Letter Grade
90>100	10	v*10	O
80>90	9	v*9	A+
70 > 80	8	v*8	A
60> 70	7	v*7	B+
55 > 60	6	v*6	B
50 > 55	5.5	V*5.5	C+
40> 50	5	v*5	C
0-40	0	v*0	F
ABSENT			AB

O - Outstanding; A+-Excellent; A-Very Good; B+-Good; B-Above Average; C+-Average; C-Satisfactory; F – Unsatisfactory.

Here, P is the percentage of marks (P=[(IA)+M] secured by a candidate in a course which is **rounded to nearest integer**. V is the credit value of the course. G is the grade and GP is the grade point.

i. Computation of SGPA and CGPA

The Following procedure to compute the Semester Grade Point Average (SGPA)

The SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses undergone by a student in a given semester, i.e : **SGPA (Si) = ∑(Ci x Gi) / ∑Ci**

where Ci is the number of credits of the ith course and Gi is the grade point scored by the student in the ith course.

Illustration for Computation of SGPA and CGPA

Illustration No. 1

Course	Credit	Grade Point	Grade letter	Credit Point (Credit x Grade point)
Course 1	**4**	**8**	**A**	**4X8=32**
Course 2	**4**	**7**	**B+**	**4X7=28**
Course 3	**3**	**9**	**A+**	**3X9=27**
Course 4	**3**	**7**	**B+**	**3X7=21**

Course 5	**3**	**6**	**B**	**3X6=18**
Course 6	**3**	**5**	**C**	**3X5=15**
Course 7	**2**	**7**	**B+**	**2X7=14**
Course 8	**2**	**8**	**A**	**2X8=16**
	24			**171**

Thus, **SGPA = 171 ÷ 24 = 7.13**

Illustration No. 2

Course	**Grade Point**	**Grade letter**	**Credit**	**Credit Point (Credit x Grade)**
Course 1	**9**	**A+**	**4**	**4X9=36**
Course 2	**8**	**A**	**4**	**4X8=32**
Course 3	**7**	**B+**	**3**	**3X7=21**
Course 4	**10**	**O**	**3**	**3X10=30**
Course 5	**5**	**C**	**3**	**3X5=15**
Course 6	**6**	**B**	**3**	**3X6=18**
Course 7	**10**	**O**	**2**	**2X10=20**
Course 8	**8**	**A**	**2**	**2X8=16**
			24	**188**

Thus, **SGPA = 188 ÷ 24 = 7.83**

Illustration No.3

Course	**Credit**	**Grade Point**	**Grade Letter**	**Credit Point (Credit x Grade point)**
Course 1	4	10	O	4 x 10 = 40
Course 2	4	9	A+	4 x 9 = 36
Course 3	3	7	B+	3 x 7 = 21
Course 4	3	8	A	3 x 8 = 24
Course 5	3	9	A+	3 x 9 = 27
Course 6	3	9	A+	3 x 9 = 27
Course 7	4	10	O	4 x 10 = 40
	24			215

Thus**, SGPA = 215 ÷ 24 = 8.99**

ii. Cumulative Grade Point Average (CGPA):

Overall Cumulative Grade Point Average (CGPA) of a candidate after successful completion of the required number of credits (144) for BA - JEP degree is calculated taking into account all the courses undergone by a student over all the semesters of a program i. e.,

CGPA = ∑(Ci x Si) / ∑Ci

Where Si is the SGPA of the ith semester and Ci is the total number of credits in that semester.

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

Illustration:

CGPA after Final Semester

Semester (ith)	No. of Credits (Ci)	SGPA (Si)	Credits x SGPA (Ci X Si)
1	24	6.83	24 x 6.83 = 163.92
2	24	7.13	24 x 7.13 = 171.12
3	24	7.83	24 x 7.83 = 187.92
4	24	8.99	24 x 8.99= 215.76
5	24	8.68	24 x 8.68 = 208.32
6	24	9.20	24 x 9.20 = 220.80
Cumulative	144		1167.84

Thus, **CGPA** = $\frac{24x6.83+24x7.13+24x7.83+24x8.99+24x8.68+24x9.20}{144}$ = 8.11

CONVERSION OF GRADES INTO PERCENTAGE:

Conversion formula for the conversion of CGPA into Percentage is:

Percentage of marks scored = CGPA Earned x 10

Illustration: CGPA Earned 8.11 x 10 = 81.10

14. Classification of Results

The final grade point (FGP) to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

CGPA	Grade (Numerical Index)	Letter Grade	Performance	FGP

	G			Qualitative Index
9 >= CGPA 10	10	O	Outstanding	Distinction
8 >= CGPA < 9	9	A+	Excellent	
7 >= CGPA < 8	8	A	Very Good	First Class
6 >= CGPA < 7	7	B+	Good	
5.5> = CGPA < 6	6	B	Above average	Second Class
> 5 CGPA < 5.5	5.5	C+	Average	
> 4 CGPA <5	5	C	Satisfactory	Pass
CGPA <4	-	F	Unsatisfactory	Unsuccessful

Overall percentage=10*CGPA

15. Challenge Valuation

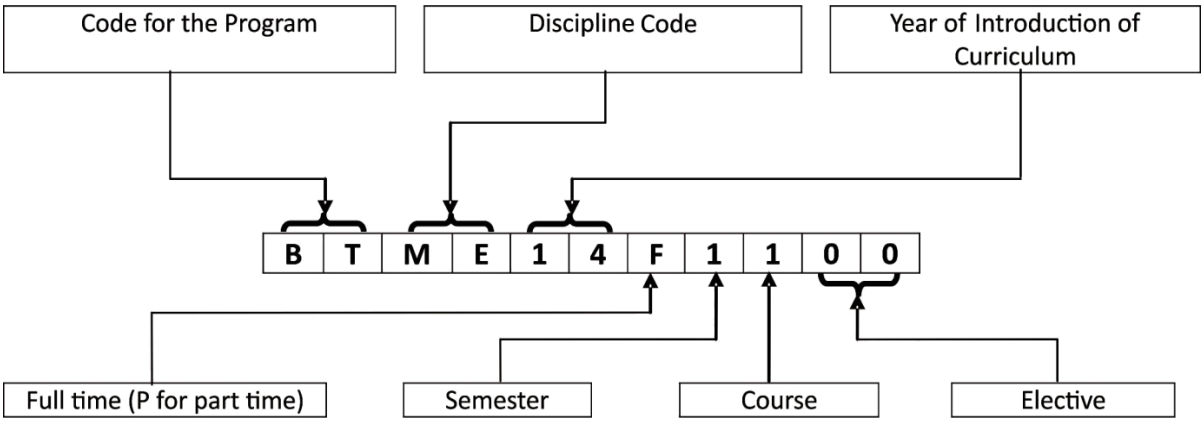
a. A student who desires to apply for challenge valuation shall obtain a photo copy of the answer script by paying the prescribed fee within 10 days after the announcement of the results. He / She can challenge the grade awarded to him/her by surrendering the grade card and by submitting an application along with the prescribed fee to the Registrar (Evaluation) within 10

days after the announcement of the results. **This challenge valuation is only for SEE (**Semester End Examination**)**.

b. The answer scripts for which challenge valuation is sought for shall be evaluated by the external examiner who has not involved in the first evaluation. The higher of two marks from first valuation and challenge valuation shall be the final.

16. With regard to any specific case of ambiguity and unsolved problem, the decision of the Vice-Chancellor shall be final.

Course Numbering Scheme



List of Codes for Programs and Disciplines / Branch of Study

Program Code	Title of the Program	Discipline Code	Name of the Discipline / Branch of Study
BA	Bachelor of Arts	AE	Advanced Embedded Systems
BB	BBA (Bachelor of Business Administration)	AI	Advanced Information Technology
BC	B.Com (Bachelor of Commerce)	AP	Advanced Power Electronics
BR	B. Arch (Bachelor of Architecture)	CA	Computer Aided Structural Engineering
BS	B Sc, BS (Bachelor of Science)	CE	Civil Engineering
BT	B.Tech (Bachelor of Technology)	CH	Chemistry
BP	Bachelor of Computer Applications	CO	Commerce
BL	LLB (Bachelor of Law)	CS	Computer Science and Engineering
MA	Master of Arts	DE	Data Engineering and Cloud
MB	MBA (Master of Business Administration)	EC	Electronics and Communication Engineering
MC	M.Com (Master of	EN	English
MS	M.Sc / MS (Master of	MD	Machine Design and Dynamics
MT	M Tech (Master of Technology)	ME	Mechanical Engineering
MO	Master of Computer Applications	EE	Electrical & Electronics Engineering

MJ	Master of Communication & Journalism	JE	Journalism, English & Psychology

BA- Journalism, English, Psychology (JEP) Program

Sl. No	Course Code	Title of the Course	HC/ SC/ CC	Credit Pattern			
				L	T	P	Total
FIRST SEMESTER							
1	17JE101K/H/E	Language – II: K / H / AE	CC	3	1	0	4
2	17JE102	Communicative English – I	FC	2	0	2	4
3	17JE103	Indian Constitution and Human Rights	FC	2	1	1	4
4	17JE104	Journalism - I (Introduction to Media & Communication)	HC	2	1	1	4
5	17JE105	English Literature & Facets of Language - I	HC	3	0	1	4
6	17JE106	Psychology - I (Foundation of Psychology)	HC	2	1	1	4
		Total Credits		**14**	**4**	**6**	**24**
SECOND SEMESTER							
1	17JE201K/H/E	Language – II: K / H / AE	CC	3	1	0	4
2	17JE202	Communicative English – II	FC	2	0	2	4
3	17JE203	Journalism - II (Reporting & Editing)	HC	2	1	1	4
4	17JE204	English Literature & Facets of Language - II	HC	3	0	1	4
5	17JE205	Psychology - II (Basic Psychological Process)	HC	2	1	1	4

6	**17JE206**	Internship / Practice / Club Activity	HC	0	0	4	4
		Total Credits		**12**	**3**	**9**	**24**
THIRD SEMESTER							
1	17JE301K/H/E	Language – II – H/K/ AE	CC	3	1	0	4
2	17JE302	Disaster Management	FC	2	0	0	2
3	17JE303	Environmental Science	FC	1	0	1	2
4	17JE304	Journalism - III (Audio-Visual	HC	2	1	1	4
5	17JE305	English Literature & Facets of Language - III	HC	3	0	1	4
6	17JE306	Psychology - III (Developmental Psychology - I)	HC	2	1	1	4
7	17JE317	Media Studies (For Non B.A. Students)	OE	2	1	1	4
		Total Credits		**15**	**4**	**5**	**24**
FOURTH SEMESTER							
1	17JE401K/H/E	Language II – H/K/AE	CC	3	1	0	4
2	17JE402	Journalism – IV (Fundamentals of Media Research)	HC	2	1	1	4
3	17JE403	American Literature and Facets of Language	HC	3	0	1	4
4	17JE404	Psychology - IV (Developmental Psychology - II)	HC	2	1	1	4
5	17JE405	Minor Project	HC	0	0	4	4
6	17JE406	Internship / Practice / Club Activity	HC	0	0	4	4
		Total Credits		**10**	**3**	**11**	**24**

FIFTH SEMESTER							
1	17JE501	Journalism-V (Media Laws & Ethics)	HC	2	2	0	4
2	17JE512	Journalism-VI (A) (Advertising & Corporate Communication)	SC	2	0	2	4
3	17JE522	Journalism-VI (B) (Fundamentals of Photography)	SC				
4	17JE503	Indian Writings in English – I	HC	3	1	0	4
5	17JE504	European and Non-European Writings - I	HC	3	1	0	4
6	17JE505	Psychology – V (Industrial Psychology - I)	HC	2	1	1	4
7	17JE516	Psychology – VI (A) (Abnormal Psychology -	SC	2	0	2	4
8	17JE526	Psychology –VI (B) (Health Psychology - I)	SC				
		Total Credits		**14**	**5**	**5**	**24**
SIXTH SEMESTER							
1	17JE601	Journalism-VII (Media Management)	HC	2	2	0	4
2	17JE612	Journalism-VIII (A) (New Media)	SC	2	0	2	4
3	17JE622	Journalism-VIII (B) (Technology for Communication)	SC				
4	17JE603	Indian Writings in English - I	HC	3	1	0	4

5	17JE604	European and Non-European Writings - I	HC	3	1	0	4
6	17JE605	Psychology – V (Industrial Psychology - II)	HC	2	1	1	4
7	17JE616	Psychology-VIII (A) (Abnormal Psychology - II)	SC	2	0	2	4
8	17JE626	Psychology-VIII (B) (Health Psychology - II)	SC				
		Total Credits		**14**	**5**	**5**	**24**
		Total Credits of All Semesters		**79**	**24**	**41**	**144**

FIRST SEMESTER

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE101E	**Communicative English - I**	HC	2	1	0	3	3

Course Description:
This is a 3 credit course for first semester consisting of 4 hours of teaching learning per week, inclusive of direct classroom teaching and practice in language lab.

Course Objectives:

- To attune young minds to concerns and issues which have a broad and wide scope of use and application to life.
- To acquire a functional use of language in context.
- To equip students to deliver formal and informal oral presentations to a variety of audiences in multiple contexts
- To enable students to construct effective written message in various formats and styles.
- To inculcate the habit of reading and writing leading to effective and efficient communication.

Course Outcomes:
On completion of the course, learners will be able to:

- Demonstrate ethical and political responsibilities in taking cognizance of issues relating to society, environment and media.
- Develop a process oriented approach to writing.
- Make use of grammatical skills developed during the course aptly.
- Utilize the target language effectively to focus on interpersonal skills and develop a good command over the language.

Course Content:

Unit-I: Functional English **12 Hours**
Remedial Grammar: Past Simple; Past Continuous; Irregular Verbs
Writing Skills: Paragraph Writing
Activities: Conversations; Leaving Phone Messages
Literature: Chief Seattle – The End of Leaving and Beginning of Survival

Unit-Ii: Interpersonal Skills **12 Hours**

Remedial Grammar: Present Simple & Present Continuous; Activity & State Verbs
Writing Skills: Official Letters
Activities: Making Apologies; Invitations & Making Arrangements
Literature: Ruskin Bond – Tiger in the Tunnel

Unit-Iii: Multitasking Skills **12Hours**

Remedial Grammar: Present Perfect; For, Since & How Long; -ed & -ing adjectives; Prefix & Opposites of Adjectives
Writing Skills: Note Making
Activities: Agreeing & Disagreeing with Opinions
Literature: Jesse Owens - My Greatest Olympic Prize

Unit-Iv: Communication Skills **12 Hours**

Remedial Grammar: Collocations; Prepositions
Writing Skills: Precise Writing
Activities: Offers, Suggestions & Requests
Literature: Avijit Pathak – Onscreen Magic

Reference Books:

1. Green, David. *Contemporary English Grammar Structures and Composition*. New Delhi: MacMillan Publishers, 2010.
2. Thorpe, Edgar and Showick Thorpe. *Basic Vocabulary*. Pearson Education India, 2012.
3. Leech, Geoffrey and Jan Svartvik. *A Communicative Grammar of English*. Longman, 2003.
4. Murphy, Raymond. *Murphy's English Grammar with CD*. Cambridge University Press, 2004.
5. Rizvi, M. Ashraf. *Effective Technical Communication*. New Delhi: Tata McGraw-Hill, 2005.
6. Riordan, Daniel. Technical Communication. New Delhi: Cengage Publications, 2011.
7. Sen et al. Communication and Language Skills. Cambridge University Press, 2015.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE101E	**Language: PÀ£ÀßqÀ - I**	HC	3	1	0	4	4

Course Outline:

¨sÁµÉAiÀÄ£ÀÄß ªÀiÁvÀ£ÁqÀÄªÀ §gÉAiÀÄÄªÀ PË±À®å, ¸Á»vÀåzÀ §UÉÎ ¸ÀÆÜ®ªÁV ¥ÀjZÀ¬Ä¸ÀÄªÀ ªÀÄÆ®PÀ «zÁåyðUÀ¼À ªÀåQÛvÀé «PÁ¸À ºÁUÀÄ ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èlÄÖPÉÆAqÀÄ, ¥Àæ¸ÀÄÛvÀ ¸ÀAzÀ¨sÀðPÉÌ «zÁåyðUÀ¼À£ÀÄß ¸ÀdÄÓUÉÆ½¸À®Ä ¥ÀoÀåªÀ£ÀÄß gÀÆ¦¸À¯ÁVzÉ. PÀ¯É ªÀÄvÀÄÛ «eÁÕ£ÀzÀ «ZÁgÀUÀ½UÉ MvÀÛ£ÀÄß ¤ÃqÀ¯ÁVzÉ. EzÀÄ ªÀÄÆgÀÄ PÉærmï ºÉÆA¢zÉ.

Course Objectives:

£Á®ÄÌ ¸É«Ä¸ÀÖgïUÀ¼À°è ¸ÀªÀÄUÀæ PÀ£ÀßqÀ ¸Á»vÀåªÀ£ÀÄß ¥ÀjZÀ¬Ä¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß ºÉÆA¢zÉ. CzÀgÀAvÉ ªÉÆzÀ®£ÉAiÀÄ ¸É«Ä¸ÀÖgï£À°è d£À¥ÀzÀ, ¥ÁæaÃ£À, ªÀÄzsÀåPÁ°Ã£À PÁªÀåUÀ¼ÀÄ, ºÉÆ¸ÀUÀ£ÀßqÀzÀ ¸ÀtÚPÀxÉUÀ¼ÀÄ ºÁUÀÄ £ÁlPÀ ¸Á»vÀåªÀ£ÀÄß ¥ÀoÀåªÀ£ÁßV DAiÉÄÌ ªÀiÁrPÉÆAqÀÄ, «zÁåyðUÀ¼À°è ¸Á»vÀåzÀ §UÉÎ ¸ÀzÀ©ügÀÄaAiÀÄ£ÀÄß ªÀÄÆr¸À¯ÁUÀÄvÀÛzÉ. ¸ÁA¸ÀÌøwPÀ w¼ÀÄªÀ½PÉAiÀÄ eÉÆvÉUÉ ªÀåQÛvÀé «PÀ¸À£ÀzÀ PÀqÉUÉ UÀªÀÄ£À ¤ÃqÀ¯ÁUÀÄvÀÛzÉ.

- ¨sÁµÉ, ¸Á»vÀå, EwºÁ¸À ªÀÄvÀÄÛ ¸ÀA¸ÀÌøwUÀ¼À£ÀÄß PÀ£ÀßqÀ, PÀ£ÁðlPÀPÉÌ ¸ÀA§A¢ü¹zÀAvÉ ¥ÀjZÀ¬Ä¸À¯ÁUÀÄvÀÛzÉ.
- «zÁåyðUÀ¼À ¸ÀªÀðvÉÆÃªÀÄÄR ¨É¼ÀªÀtÂUÉUÉ C£ÀÄªÁUÀÄªÀAvÉ ºÁUÀÆ CªÀgÀ°è ªÀiÁ£ÀªÀ ¸ÀA§AzsÀUÀ¼À §UÉÎ UËgÀªÀ, ¸ÀªÀiÁ£ÀvÉ ªÀÄÆr¹, ¨É¼É¸ÀÄªÀ ¤nÖ£À°è ¥ÀoÀåUÀ¼À DAiÉÄÌAiÀiÁVzÉ.
- CªÀgÀ°è ¸ÀÈd£À²Ã®vÉ, ±ÀÄzÀÞ ¨sÁµÉ, GvÀÛªÀÄ «ªÀÄ±Áð UÀÄt, ¤gÀUÀð¼À ¸ÀA¨sÁµÀuÉ, ¨sÁµÀt PÀ¯É ºÁUÀÆ §gÀºÀ PË±À®åUÀ¼À£ÀÄß ¨É¼É¸ÀÄªÀÅzÀÄ UÀÄjAiÀiÁVzÉ
- ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ½UÉ C£ÀÄPÀÆ®ªÁUÀÄªÀAvÀºÀ «µÀAiÀÄUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èèlÄÖPÉÆAqÀÄ ¸ÀÆPÀÛ ¥ÀoÀåUÀ¼À£ÀÄß DAiÉÄÌ ªÀiÁrPÉÆ¼Àî¯ÁVzÉ.

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Course Outcomes:

d£À¥ÀzÀ, ¥ÁæaÃ£À, ªÀÄzsÀåPÁ°Ã£À PÁªÀåUÀ¼ÀÄ, ºÉÆ¸ÀUÀ£ÀßqÀzÀ ¸ÀtÚPÀxÉUÀ¼ÀÄ ºÁUÀÄ £ÁlPÀ ¸Á»vÀå PÀ°PÉAiÀÄ ªÀÄÆ®PÀ PÁ®zÀ ¹ÜvÀåAvÀgÀUÀ¼À£ÀÄß CzÀgÀ M¼À£ÉÆÃlUÀ¼À£ÀÄß ¨É¼É¸ÀÄvÀÛzÉ.

- ¸ÁªÀiÁfPÀ, gÁdQÃAiÀÄ, zsÁ«ÄðPÀ, ¸ÁA¸ÀÌøwPÀ ºÁUÀÆ °AUÀ¸ÀA§A¢ü «ZÁgÀUÀ¼ÉqÉ UÀªÀÄ£ÀºÀj¸ÀÄªÀÅzÀgÉÆA¢UÉ «zÁåyðUÀ¼À°è ZÀZÁð ªÀÄ£ÉÆÃ¨sÁªÀªÅ ¨É¼ÉAiÀÄÄvÀÛzÉ.
- fÃªÀ£ÀzÀ°è §gÀÄªÀ C©ü¥ÁæAiÀÄ ¨ÉÃzsÀUÀ¼ÀÄ, ¸ÀªÀÄ¸ÉåUÀ¼À£ÀÄß DzsÀÄ¤PÀ ¸ÀAzÀ¨sÀðzÀ°è ªÀiÁ£À«ÃAiÀÄvÉAiÉÆA¢UÉ ¤ªÀð»¸ÀÄªÀAvÉ ¥ÉæÃgÉÃ¦¸ÀÄvÀÛzÉ.
- GvÀÛªÀÄ ¸ÀAªÀºÀ£À PÀ¯ÉAiÀÄ£ÀÄß ¨É¼É¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß FqÉÃj¸ÀÄvÀÛzÉ.

Course Content:

Unit I **d£À¥ÀzÀ ªÀÄvÀÄÛ ¥ÁæaÃ£À PÁªÀå** **12 Hours**

1. ¸ÀvÀåªÀAvÉ ºÀqÉzÀªÁé- d£À¥ÀzÀ VÃvÉ
2. £É®¸ÀÄUÉ ¤£Àß ªÀPÀëzÉÆ¼É- ¥ÀA¥À
3. ÀÄqÀÄ ZÀ¥À¼É d¥ÀzÀ ªÀÄtÂAiÀÄA- £ÁUÀªÀªÀÄð
4. avÀæªÀÄ¥ÁvÉæ gÀªÀÄvÉ £Áj- d£Àß

Unit II **ªÀÄzsÀåPÁ°Ã£À PÁªÀå** **12 Hours**

1. C©ÞAiÀÄÄªÉÆªÉÄð PÁ®ªÀ±À¢A ªÀÄgÁåzÉAiÀÄA zÁAlzÉÃ.... £ÁUÀZÀAzÀæ
2. ªÀZÀ£ÀUÀ¼ÀÄ CPÀÌªÀÄºÁzÉÃ«
3. ªÀZÀ£ÀUÀ¼ÀÄ §¸ÀªÀtÚ
4. UÀÄAqÀAiÀÄå£À gÀUÀ¼É ºÀjºÀgÀ

Unit III **¸ÀtÚ PÀxÉUÀ¼ÀÄ** **12 Hours**

1. zÀÄµÀÖ§Ä¢ÞAiÀÄÄA zsÀªÀÄð§Ä¢ÞAiÀÄÄA zÀÄUÀð¹AºÀ
2. PÀ¯ÁärAiÀÄ PÉÆÃt ªÀiÁ¹Û
3. AiÀiÁgÀÆ CjAiÀÄzÀ «ÃgÀ PÀÄªÉA¥ÀÄ
4. ¸ÀªÀÄ¸ÉåAiÀÄ ªÀÄUÀÄ wæªÉÃtÂ

Unit IV **£ÁlPÀ** **12 Hours**

mÉÆ¼ÀÄîUÀnÖ n.¦. PÉÊ¯Á¸ÀA

¥ÀgÁªÀÄ±Àð£À UÀæAxÀUÀ¼ÀÄ :

1. ªÀÄÄUÀ½ gÀA.²æÃ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ VÃvÁ §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 2014
2. ¸ÀAUÀæºÀ. £ÁUÉÃUËqÀ JZï.J¯ï., ZÁjwæPÀ d£À¥ÀzÀ PÀxÀ£À PÁªÀåUÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ PÀ£ÁðlPÀ eÁ£À¥ÀzÀ ¥ÀjµÀvÀÄÛ, ¨ÉAUÀ¼ÀÆgÀÄ. 2008
3. ¹ÃªÀiÁwÃvÀ PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ ¸ÀA¥ÀÄl 1,2,3,4,5 ªÀÄvÀÄÛ 6, PÀÄªÉA¥ÀÄ PÀ£ÀßqÀ CzsÀåAiÀÄ£À ¸ÀA¸ÉÜ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ, ªÉÄÊ¸ÀÆgÀÄ. 2014
4. ¸ÀAUÀæºÀ. £ÁUÉÃUËqÀ JZï.J¯ï., PÀ£ÀßqÀ d£À¥ÀzÀ PÀxÀ£À PÁªÀåUÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ PÀ£ÁðlPÀ eÁ£À¥ÀzÀ ¥ÀjµÀvÀÄÛ, ¨ÉAUÀ¼ÀÆgÀÄ. 2007
5. ºÀA¥À £ÁUÀgÁdAiÀÄå, ¸ÁAUÀvÀå PÀ«UÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
6. £ÁgÁAiÀÄt ¦.«, ZÀA¥ÀÆ PÀ«UÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
7. PÁ¼ÉÃUËqÀ £ÁUÀªÁgÀ, wæ¥À¢, gÀUÀ¼É ªÀÄvÀÄÛ eÁ£À¥ÀzÀ ¸Á»vÀå, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
8. ¸ÀA. ¨É£ÀUÀ¯ï gÁªÀÄ gÁªï ªÀÄvÀÄÛ ¥Á£ÀåA ¸ÀÄAzÀgÀ ±Á¹ÛçÃ, ¥ÀÄgÁt £ÁªÀÄ ZÀÆqÁªÀÄtÂ, ¥ÀæPÁ±ÀPÀgÀÄ ¥Àæ¸ÁgÁAUÀ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ. 2010
9. qÁ. azÁ£ÀAzÀ ªÀÄÆwð, ªÀZÀ£À ¸Á»vÀå, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2013
10. ¸ÀA. §¸ÀªÀgÁdÄ J¯ï. ¸ÀªÀðdÕ£À ªÀZÀ£ÀUÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ VÃvÁ §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 2012
11. ¸ÀA. §¸ÀªÀgÁdÄ J¯ï. CPÀÌ£À ªÀZÀ£ÀUÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ VÃvÁ §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 1997
12. ¸ÀA ªÀÄgÀÄ¼À¹zÀÝ¥Àà PÉ, £ÁUÀgÁd Q.gÀA. ªÀZÀ£À PÀªÀÄäl, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2016
13. £ÀgÀ¹AºÁZÁgï. r.J¯ï., ¥ÀA¥À ¨sÁgÀvÀ ¢Ã¦PÉ, ¥ÀæPÁ±ÀPÀgÀÄ r.«.PÉ ªÀÄÆwð ¥ÀæPÁ±À£À, ªÉÄÊ¸ÀÆgÀÄ. 2012

14. gÀAeÁ£ï zÀUÁð, ±ÀgÀtgÀ ¸ÀªÀÄUÀæ PÁæAw, ¥ÀæPÁ±ÀPÀgÀÄ. ¯ÉÆÃ»AiÀiÁ ¥ÀæPÁ±À£À, §¼Áîj. 2015
15. zÉÃ±À¥ÁAqÉ J¸ï.J¯ï. ¨ÉÃAzÉæ ±ÀjÃ¥sÀgÀ PÁªÁåAiÀiÁ£À, ¥ÀæPÁ±ÀPÀgÀÄ zÉÃ¹ ¥ÀÄ¸ÀÛPÀ, ¨ÉAUÀ¼ÀÆgÀÄ. 2013
16. ¸ÀA. ©.J¸ï. PÉÃ±ÀªÀgÁªï. PÉÊ¯Á¸ÀA PÀ£ÀßqÀ £ÁlPÀUÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ CAQvÀ ¥ÀÄ¸ÀÛPÀ, ¨ÉAUÀ¼ÀÆgÀÄ. 2005
17. ±ÁªÀÄgÁAiÀÄ vÀ.¸ÀÄ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ vÀ¼ÀÄQ£À ªÉAPÀtÚAiÀÄå ¸ÁägÀPÀ UÀæAxÀªÀiÁ¯É, ªÉÄÊ¸ÀÆgÀÄ -2014
18. ²ªÀgÀÄzÀæ¥Àà f.J¸ï. PÀ£ÀßqÀ ¸Á»vÀå ¸À«ÄÃPÉë, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2013

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE101E	**Language: Hindi-I**	HC	3	1	0	3	4

पाठ्यक्रम रूपरेखा :

यह पाठ्यक्रम नौसिखिया, अपनी भाषा की क्षमता का सिकाि करने हेतु तथा सिसभन्न िासहखिक प्रसक्रयाओं द्वारा िमाज, िंस्कृ सत एिं जीिन के मूल्यं कय िमझने हेतु असभकखित है |

पाठ्यक्रम उद्देश्य :

- िंदभानुिार उसित भाषा का प्रययग करने की दक्षता कय छात्यं मेंं उत्पन्न करना |
- िासहि के माध्यम िे िमाज एिं मानीय मूल्यं कय िमझाकर, उन मूल्यं की रक्षा हेतु प्रेररत करना |
- छात्यं मेंं पुस्तक पठन एिं लेिन की अकृ सतम प्रिृसि स्थासपत करना |
- अध्येताओं मेंं िासहि के माध्यम िे प्रभािी एिं कु शल िंिार का सिकाि करना |

अधिगम पररणाम :

अध्ययन की िमाखि पर अध्येयता –

- िामासजक मूल् एिं नैसतक जिाबदेही कय स्वीकार कर िकता है |
- िासहि की प्राि्ंसगकता कय जीिन में िमझने की दक्षता रिता है |
- िमाज मेंं अंतसनसहत पद्दसतया एिं सिचारधाराओं का व्याख्यान करने मेंं िक्षम बन िकता है |

<u>अध्ययन धिषय सूची / पाठ्यक्रम</u>

इकाई – 1: कहानी, िंस्मरण **अध्यापन अिधियाँ :** 12 hrs.

1.कहानी – नशा – प्रेमिंद

2.कहानी – िुिमय जीिन – िंद्रधर शमा गुलेरी

3.िंस्मरण – शरत के िाथ सबतायाा कु छ िमय – अमृतलाल नागर

इकाई – 2: कहानी, आत्मकथा **अध्यापन अिधियाा :** 12 hrs.

4.कहानी – मरने िे पहले – भीष्म िाहनी
5.कहानी – लाल हिेली – शिानी
6.आत्मकथा – जेल– जीिन की झलक - गणेश शंकर िद्यार्थी

इकाई – 3: कहानी, व्यंग्य रिना **अध्यापन अिधियाा :** 12 hrs.

7.कहानी – िाय का एक प्यालाा – कै थरीन मैन्सफील्ड
8.व्यंग्य रिना – भेड़े और भेसियें – हररशंकर परिाई

इकाई – 4: अनुिाद, िंक्षेपण **अध्यापन अिधियाा :** 12 hrs.

अनुिाद : अंग्रेज़ी – सहन्दी (शब्द एिं अनुच्छेद)
संक्षेपण : पररच्छेद का एक सतहाई भाग में |
सन्दर् ग्रन्थ :

- पाठ्य पुस्तक – रेिा सिश्वसिद्यालय
- िुबयध व्यिहाररक सहन्दी – िॉ. कु लदीप गुि
- असभनि व्यिहाररक सहन्दी – िॉ.परमानन्द गुि
- सहन्दी िासहि का इसतहाि - िॉ. नागेद्र
- आधुसनक सहन्दी िासहि का इसतहाि - िॉ. बच्चन सिंह
- सहन्दी िासहि का निीन इसतहाि - िॉ. लाल िाहब सिंह
- शुद्ध सहन्दी कै िे बयले कै िे सलि- पृथ्वीनाथ पाण्डे
- कायालय अनुिाद सनदेशका
- िंक्षेपण और पल्लिन - के.िी.भासिया&तुमन सिंग

सूचना : पाठ ३. प्रणाम और ६. सनराला : एक आकसषत व्यखित्व के स्थान पर ३. शरत के िाथ सबतायाा हुआ कु छ िमय और ६. जेल जीिन की झलक पाठ कय ियन करके , पाठ्यक्रम मेंं िंशयधन सकयाा गयाा है |

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE102	**Lang: Addditional English-I**	HC	3	1	0	3	4

Course Objectives:

1. To equip students with the ability to acquire the functional use of language in context.

2. To enable the students to explore and critique issues related to society and Ethics.
3. To develop in the students a genuine habit of reading and writing leading to effective and efficient communication.

Course Outcomes:

On completion of the course, learners will be able to:

1. Demonstrate ethical responsibilities in taking cognizance of issues relating to society and values.
2. Develop an understanding of literature in context.
3. Interpret and paraphrase their ideas logically and cohesively.
4. Illustrate the systems and ideologies inherent in the society.

Course Contents:

Unit-I: Functional English **12 Hours**

Remedial Grammar: Past Simple; Past Continuous; Irregular Verbs
Writing Skills: Paragraph Writing
Activities: Conversations; Leaving Phone Messages
Literature: Chief Seattle – The End of Leaving and Beginning of Survival

Unit-II: Interpersonal Skills **12 Hours**

Remedial Grammar: Present Simple & Present Continuous; Activity & State Verbs
Writing Skills: Official Letters
Activities: Making Apologies; Invitations & Making Arrangements
Literature: Ruskin Bond – Tiger in the Tunnel

Unit-III: Multitasking Skills **12 Hours**

Remedial Grammar: Present Perfect; For, Since & How Long; -Ed & -Ing Adjectives; Prefix & Opposites Of Adjectives
Writing Skills: Note Making
Activities: Agreeing & Disagreeing With Opinions
Literature: Jesse Owens - My Greatest Olympic Prize

Unit-IV: Communication Skills **12 Hours**

Remedial Grammar: Collocations; Prepositions
Writing Skills: Precis Writing
Activities: Offers, Suggestions & Requests
Literature:Avijit Pathak – Onscreen Magic

Reference Books:

1. Green, David. *Contemporary English Grammar Structures and Composition*. New Delhi: MacMillan Publishers, 2010.
2. Thorpe, Edgar and Showick Thorpe. *Basic Vocabulary*. Pearson Education India, 2012.
3. Leech, Geoffrey and Jan Svartvik. *A Communicative Grammar of English*. Longman, 2003.
4. Murphy, Raymond. *Murphy's English Grammar with CD*. Cambridge University Press, 2004.
5. Rizvi, M. Ashraf. *Effective Technical Communication*. New Delhi: Tata McGraw-Hill, 2005.
6. Riordan, Daniel. Technical Communication. New Delhi: Cengage Publications, 2011.
7. Sen et al. Communication and Language Skills. Cambridge University Press, 2015

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE104	**Introduction to Media and Communication**	HC	2	0	2	4	5

Course Description:

The course titled Introduction to Media and Communication provides students the opportunity to explore the various elements in the communication process as well as get acquainted with communication models that explain how and why we communicate the way we do. Students explore the models that explain how communication influences our perspective of others, the world and ourselves. By examining media messages from print, electronic media and new media, students explore how the media create meaning and how technology shapes the ways we communicate.

Course Objectives:

- To help the students explore the process of communication and study the various models of communication
- To delve into the history and aspects of print, electronic and new media
- To generate awareness of students about the media messages and their impact on everyday life.

Course Outcomes:

On completion of this course, the student would be able to:

- List detailed understanding about process and elements in communication
- Define the process, models and levels of communication
- Relate to the various types of mass media

Course Content:

Unit I: Process and Elements of Communication; 12 Hours

Communication-Definition, nature, scope, process and elements of communication; Types of communications-verbal, non-verbal, intrapersonal, interpersonal, group, mass communication; Functions of communication; Models of communication: Aristotle's Rhetoric Model, The Lasswell model, Shannon and Weaver model, Osgood and Schramm circular model, Berlo's model.

Unit II: Folk and Print Media; 12 Hours

Folk media, Types of Folk Media; Print media; Content pattern and characteristics of dailies and periodicals, tabloids, magazines; Brief history of Indian Journalism; Language press; News Agencies in India; Kannada Journalism.

Unit III: Broadcast Media & Films; 12 Hours

Broadcast Media - Radio as a medium of communication- Brief history of radio; Programme pattern of Radio; FM Radio; Community radio; . Television as a medium of communication- Brief history of TV; Satellite communication; Cinema – Cinema as a medium of communication; Types of cinema; CBFC, FTII, and NFAI.

Unit IV: Issues in Journalism 12 Hours

Current Issues in Media- New Media- Characteristics; Citizen Journalism; Role of Media in a Democracy- Public Sphere; Yellow Journalism; Breaking News; Trial by media; Media and Children; Media and Youth; Media and Women.

Practical Component:

- Coverage of local issues in the media- Print/TV/Radio
- Case Study
- Group Discussion
- Wall Magazine
- Collage Making
- Glossary Terms
- **Media Visit:** Theatre festival/ Film festival/ Literary festival/ Poets meet/ Political rally/ Seminars/ Museums.

Reference Books:

1. Vivian John. 2012. *The Media of Mass Communication*. New Delhi:PHI learning private limited.
2. J Kumar Keval. 2006. *Mass communications in India*. Mumbai: Jaico Publication.

3. Devi Meena. 2006. *Fundamentals Of Mass Media And Communication*. New Delhi: Alfa Publication.
4. Mcquail Denis. 2004. *Mass Communication Theory*. New Delhi: Sage Publication.
5. Chandra Ramesh. 2004. *Analysis of Media and Communication Trends*. New Delhi : Gyan Books publishers Pvt Ltd.
6. S Baran Stanly and K. Davis ,Dennis.1999. *Mass Communication Theory*: *Foundations Ferment and Future*. Singapore :Thomson Wads Worth.
7. PC Chatterji .1991. *Broadcasting in India*. New Delhi: Sage Publications.
8. BN Ahuja .1988. *History of Indian Press*. New Delhi: Surjeeth Publication.
9. Krishnamurthy Nadige. 1966. *Indian Journalism*. University of Mysore Prasaranga.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE105	**English Literature & Language – I**	HC	3	1	0	3	4

Course Desription:

English literature and language is one of the most significant subjects for the concerned UG program. This course is designed to introduce the students to the basic ideas of literature, mostly focused on the British canon in order to develop their literary as well as cognitive skills which would be surely beneficial for them in their future literary as well as non-literary endeavours.

Course Objectives:

- To introduce the students to the framework of different literary genres
- To introduce the students to the idea of literary ages and its significance.
- To introduce the students to the works of important authors from the medieval age to the neo-classical age.
- To develop in the students a skill of understanding basic cultural contexts into which the texts are systematically located.

Course Outcomes:

On completion of the course, students will be able to:

- Identify the major poets from the medieval period up to the neo-classical period and their works in English Literature.
- Explain the major characteristics of Metaphysical Poetry.
- Outline the various issues presented in the prose of the period.
- Demonstrate complete familiarity with the features of Elizabethan theatre.
- Illustrate a good understanding of speech sounds in English and the structure of words.

Course Content:

Unit 1: Poetry **12 Hours**

The Medieval Age:

1. Chaucer - "Wife of Bath" (from *Prologue to the Canterbury Tales*)

The Elizabethan Age:

2. Edmund Spencer – Sonnet 75 (from the *Amoretti*)
3. William Shakespeare – Sonnet 118

The Puritan Age:

14. John Milton – Extract from *Paradise Lost* (Book – I)

Metaphysical Poetry:

5. John Donne – The Sunne Rising
6. George Herbert – The Altar
7. Andrew Marvell – To His Coy Mistress

The Neoclassical Age:

8. Alexander Pope – Extract from *The Rape of the Lock*

Unit II: Prose **12 Hours**

1. Francis Bacon – Of Travel; Of Studies
2. Joseph Addison – Silence

3. Dr. Samuel Johnson – Extract from *Preface to Shakespeare*

4. Oliver Goldsmith – Extract from *The Citizen of the World*

Unit III: Drama **12 Hours**

William Shakespeare – *Macbeth*

Christopher Marlowe – *Dr. Faustus*

Unit IV Language: **12 Hours**

1. Language
2. Speech Sounds in English
3. The Structure of Words

Reference Books:

1. Chaucer, Geoffrey. *The Canterbury Tales*. Harper Press, 2012.
2. Warrren, Robert Penn. *Six Centuries of Great Poetry*. Dell, 1992.
3. Shakespeare, William. *The Sonnets*. Macmillan, 2016.
4. Milton, John. *Paradise Lost*. Penguin, 2003.
5. Ricks, Christopher, *Metaphysical Poetry*. Penguin, 2006.
6. Kaul, RK. *The Rape of the Lock*. Oxford, 1997.
7. Bacon, Francis. *The Essays*. Penguin, 1985.
8. Addison, Joseph. *Addison and Steele*. Forgotten Books, 2018.
9. Sen, S. *Dr. Johnson: Preface to Shakespeare*. Unique Publishers, 1989.
10. Goldsmith, Oliver. *The Citizen of the World*. University Press of the Pacific, 2002.

11. Shakespeare, William. *Macbeth*. Oxford University Press, 2016.
12. Marlowe, Christopher, *Dr. Faustus*. Oxford University Press, 2010.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE106	**FOUNDATIONS OF PSYCHOLOGY-I**	HC	2	0	2	4	5

Course Description:

This course is designed to give students an overview of what psychological science has discovered about human behavior and mental processes over the past century. An evolutionary, functional perspective will be applied across the many fields of psychology. Students will gain an understanding of the psychological phenomena that occur in daily life as well as the practical applications of psychological knowledge.

Course Objectives

In accordance with the American Psychological Association (APA) recommendations for undergraduate psychology learning objectives and outcomes, students will (1) learn the basic principles of traditional psychological content areas and (2) use the scientific method as an approach to critical thinking and sceptical inquiry. Accomplishing this objective involves:

- Demonstrating knowledge and understanding of theory and research in the general domains of psychology
- Understanding the overarching themes, questions, and conflicts in psychology
- Comparing and contrasting the major perspectives in psychology
- Understanding and evaluating basic research methods used by psychologists to address different hypotheses
- Evaluating the validity of conclusions derived from psychological research

Course Outcomes:

On completion of this course, the student would be able to:

Upon successful completion of this course, students will be able to:

- Differentiate among various subfields of psychology.
- Identify the primary research methods employed in the study of psychology
- Identify the primary objectives (goals) of psychology.
- Demonstrate knowledge of ethical principles and limitations of research in psychology.
- Critically evaluate sources of information in the field of psychology, including research articles published in major psychological journals.

Course Content:

Unit-I: The Science Of Psychology **12 hours**

a) Definition and goals of Psychology, History of Psychology
b) Modern perspectives of studying human behavior- Psychodynamic perspectives, Behavioral perspectives, Cognitive perspectives, Humanistic perspectives.
c) Fields of psychology Applied –General psychology, Educational Psychology, Industrial psychology, clinical psychology, counseling psychology, social psychology, developmental psychology, Para psychology, Positive psychology.
d) Psychological Research: The nature of Science and scientific approach, Introduction to qualitative and quantitative research.
e) Types of Psychological Research: Descriptive research – observation method, survey method, interview method, case studies. Experimental Research.

Unit-II: Psysiological Basis of Behaviour **12 hours**

a) Neuron and nerves (neural impulse, neuro transmitters)
b) Nervous System: 1. Central Nervous System: Brain Structure of the brain, structure of the cortex, association areas of the cortex (Broca's area and wernicke's area). Techniques of studying brain.
2. The peripheral nervous system: somatic & autonomic nervous system. (Sympathetic & Parasympathetic)
c) Physiological context of memory
d) Endocrine system: Endocrine glands and its influences on human behaviour.

Unit-III: Learning, Memory and Forgetting **12 hours**

A. Learning:
a) Meaning and definition of learning, factors influencing on learning.
b) Theories of learning: 1.Thorndike's Trial and error learning and laws of learning.
2. Classical conditioning and its principles, (acquisition, generalization, discrimination, extinction and spontaneous recovery) Applications of classical conditioning.
3. Operant conditioning – Skinner's approach to operant conditioning (positive and negative reinforcement, and primary and secondary reinforcement). Applications of operant conditioning.
4. Insight learning theory and its applications.
B. Memory and Forgetting
a) Nature of memory – (Memory Encoding, Attention Level of processing, Elaboration, Imaginary)

b) Forgetting – nature and causes of forgetting (Decay theory, Interference theory, Memory dysfunction], types of forgetting.
c) Improving memory: Mnemonics.

Unit-IV: Motivation And Emotion **12 hours**

A. Motivation

a) Meaning and nature of motivations – Homeostasis, Motivation cycle.
b) Types of motives: Physiological motives – Hunger, thirst, sex. Social motives – Achievement, power affiliation
c) Theories of motivation - Drive reduction approach, instinct approach, incentive approach, Humanistic approach (Maslow's theory)

B. Emotions:

a) Meaning, Nature of emotions
b) Physiological and Psychological changes.
c) Types of emotions.
d) Cognitive mediational theory of emotion
e) Emotional intelligence.

PRACTICAL – 1

1. Directed observation and accuracy of report.
2. Habit interference
3. Emotional Intelligence
4. Cueing on recall
5. Maze learning.

References Books:

1. Robert S. *Feldman* (2004) *understanding Psychology* 6th *Edition* Tata MrGram – Hill.
2. Saundra K Ciccarelli and Glenn E Meyer (2008), Psychology, South Asia Edition,
3. Robert A Baron (2001), Psychology, III Edition, Prentice Hall Publications
4. John. W. Santrock (2006), Psychology Essentials, 2nd Edition Tata Mc Graw Hill
5. Hillgord & Atkinson (2009), Introduction to Psychology Oxford IBH publishing Co. Pvt. Ltd.
6. Morgan, King (2004), Introduction to Psychology, VII Edition, 1989, Mc Graw Hill IBH Publication

SECOND SEMESTER

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE202	**Communicative English - II**	HC	2	1	0	3	3

Course Outline:
This is a 3 credit course for second semester consisting of 4 hours of teaching learning per week, inclusive of direct classroom teaching and practice in language lab.

Course Objectives:

- To prepare the students to become successful professionals by enhancing their communicative skills.
- To develop the grammatical base of the students which would serve them in the long run.
- To equip the students to form a strong command over vocabulary.

Course Outcomes:
On completion of the course, learners will be able to:

- Develop professional communicative skills.
- Apply their acquired grammatical knowledge in broader spheres of linguistic usage.
- Utilize their communicative skills in multiple arenas of practical existence.

Course Content:

Unit-I: Language Acquisition **12 Hours**
Remedial Grammar: Questions & Negatives; Questions Tags
Writing Skills: Email Writing
Activities: Group Discussions
Literature: Alphonse Daudet - The Last Lesson

Unit-II: Persuasive Skills **12 Hours**
Remedial Grammar:Past Simple & Past Perfect
Writing Skills:Report Writing
Activities:Book & Movie Reviews
Literature:Lord Alfred Tennyson – Ulysses

Unit-III: Cognitive Skills **12 Hours**
Remedial Grammar:Present & Past Passive; Conditionals

Writing Skills:Creative Writing
Activities:Role Plays
Literature:O. Henry – The Gift of the Magi

Unit-IV: Employability Skills **12 Hours**

Remedial Grammar:Reported Speech; Idioms
Writing Skills:Cover Letter & CV
Activities:Exchanging Information
Literature:Saki – The Open Window

Reference Books:

1. Bansal, R.K. and J.B. Harrison. *Spoken English*. Orient Blackswan, 2013.
2. Raman, Meenakshi and Sangeeta Sharma. *Technical Communication*. Oxford University Press, 2015.
3. Thorpe, Edgar and Showick Thorpe. *Objective English*. Pearson Education, 2013.
4. Dixson, Robert J. *Everyday Dialogues in English*. Prentice Hall India Pvt Ltd., 1988.
5. Turton, Nigel D. *ABC of Common Errors*. Mac Millan Publishers, 1995.
6. Samson, T. (ed.) *Innovate with English.* Cambridge University Press, 2010.
7. Kumar, E Suresh, J. Savitri and P Sreehari (ed). *Effective English*. Pearson Education, 2009.
8. Goodale, Malcolm. *Professional Presentation*. Cambridge University Press, 2013.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE201K	**Language: Kannada-II**	HC	2	1	0	3	4

Course Outline:
¨sÁµÉAiÀÄ£ÀÄß ªÀiÁvÀ£ÁqÀÄªÀ §gÉAiÀÄÄªÀ PË±À®å, ¸Á»vÀåzÀ §UÉÎ ¸ÀÆÜ®ªÁV ¥ÀjZÀ¬Ä¸ÀÄªÀ ªÀÄÆ®PÀ «zÁåyðUÀ¼À ªÀåQÛvÀé «PÁ¸À ºÁUÀÄ ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èlÄÖPÉÆAqÀÄ, ¥Àæ¸ÀÄÛvÀ ¸ÀAzÀ¨sÀðPÉÌ «zÁåyðUÀ¼À£ÀÄß ¸ÀdÄÓUÉÆ½¸À®Ä ¥ÀoÀåªÀ£ÀÄß gÀÆ¦¸À¯ÁVzÉ. PÀ¯É ªÀÄvÀÄÛ «eÁÕ£ÀzÀ «ZÁgÀUÀ½UÉ MvÀÛ£ÀÄß ¤ÃqÀ¯ÁVzÉ. EzÀÄ ªÀÄÆgÀÄ PÉærmï ºÉÆA¢zÉ.

Course Objectives:
£Á®ÄÌ ¸É«Ä¸ÀÖgïUÀ¼À°è ¸ÀªÀÄUÀæ PÀ£ÀßqÀ ¸Á»vÀåªÀ£ÀÄß ¥ÀjZÀ¬Ä¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß ºÉÆA¢zÉ. CzÀgÀAvÉ JgÀqÀ£ÉAiÀÄ ¸É«Ä¸ÀÖgï£À°è ¥ÁæaÃ£À, ªÀÄzsÀåPÁ°Ã£À PÁªÀåUÀ¼ÀÄ, ¯ÉÃR£ÀUÀ¼ÀÄ ºÁUÀÄ ¥ÀæªÁ¸À PÀxÀ£À ¸Á»vÀåªÀ£ÀÄß ¥ÀoÀåªÀ£ÁßV DAiÉÄÌ ªÀiÁrPÉÆAqÀÄ, «zÁåyðUÀ¼À°è ¸Á»vÀåzÀ §UÉÎ ¸ÀzÀ©ügÀÄaAiÀÄ£ÀÄß ªÀÄÆr¸À¯ÁUÀÄvÀÛzÉ. ¸ÁA¸ÀÌøwPÀ w¼ÀÄªÀ½PÉAiÀÄ eÉÆvÉUÉ ªÀåQÛvÀé «PÀ¸À£ÀzÀ PÀqÉUÉ UÀªÀÄ£À ¤ÃqÀ¯ÁUÀÄvÀÛzÉ.

- ¨sÁµÉ, ¸Á»vÀå, EwºÁ¸À ªÀÄvÀÄÛ ¸ÀA¸ÀÌøwUÀ¼À£ÀÄß PÀ£ÀßqÀ, PÀ£ÁðlPÀPÉÌ ¸ÀA§A¢ü¹zÀAvÉ ¥ÀjZÀ¬Ä¸À¯ÁUÀÄvÀÛzÉ.
- «zÁåyðUÀ¼À ¸ÀªÀðvÉÆÃªÀÄÄR ¨É¼ÀªÀtÂUÉUÉ C£ÀÄªÁUÀÄªÀAvÉ ºÁUÀÆ CªÀgÀ°è ªÀiÁ£ÀªÀ ¸ÀA§AzsÀUÀ¼À §UÉÎ UËgÀªÀ, ¸ÀªÀiÁ£ÀvÉ ªÀÄÆr¹, ¨É¼É¸ÀÄªÀ ¤nÖ£À°è ¥ÀoÀåUÀ¼À DAiÉÄÌAiÀiÁVzÉ.
- CªÀgÀ°è ¸ÀÈd£À²Ã®vÉ, ±ÀÄzÀÞ ¨sÁµÉ, GvÀÛªÀÄ «ªÀÄ±Áð UÀÄt, ¤gÀUÀð¼À ¸ÀA¨sÁµÀuÉ, ¨sÁµÀt PÀ¯É ºÁUÀÆ §gÀºÀ PË±À®åUÀ¼À£ÀÄß ¨É¼É¸ÀÄªÀÅzÀÄ UÀÄjAiÀiÁVzÉ
- ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ½UÉ C£ÀÄPÀÆ®ªÁUÀÄªÀAvÀºÀ «µÀAiÀÄUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èèlÄÖPÉÆAqÀÄ ¸ÀÆPÀÛ ¥ÀoÀåUÀ¼À£ÀÄß DAiÉÄÌ ªÀiÁrPÉÆ¼Àî¯ÁVzÉ.

Course Outcomes:

¥ÁæaÃ£À, ªÀÄzsÀåPÁ°Ã£À PÁªÀåUÀ¼ÀÄ, ºÉÆ¸ÀUÀ£ÀßqÀzÀ ¯ÉÃR£ÀUÀ¼ÀÄ ºÁUÀÄ ¥ÀæªÁ¸À PÀxÀ£À ¸Á»vÀå PÀ°PÉAiÀÄ ªÀÄÆ®PÀ PÁ®zÀ ¹ÜvÀåAvÀgÀUÀ¼À£ÀÄß CzÀgÀ M¼À£ÉÆÃlUÀ¼À£ÀÄß ¨É¼É¸ÀÄvÀÛzÉ.

- ¸ÁªÀiÁfPÀ, gÁdQÃAiÀÄ, zsÁ«ÄðPÀ, ¸ÁA¸ÀÌøwPÀ ºÁUÀÆ °AUÀ¸ÀA§A¢ü «ZÁgÀUÀ¼ÉqÉ UÀªÀÄ£ÀºÀj¸ÀÄªÀÅzÀgÉÆA¢UÉ «zÁåyðUÀ¼À°è ZÀZÁð ªÀÄ£ÉÆÃ¨sÁªÀªÀÅ ¨É¼ÉAiÀÄÄvÀÛzÉ.
- fÃªÀ£ÀzÀ°è §gÀÄªÀ C©ü¥ÁæAiÀÄ ¨ÉÃzsÀUÀ¼ÀÄ, ¸ÀªÀÄ¸ÉåUÀ¼À£ÀÄß DzsÀÄ¤PÀ ¸ÀAzÀ¨sÀðzÀ°è ªÀiÁ£À«ÃAiÀÄvÉAiÉÆA¢UÉ ¤ªÀð»¸ÀÄªÀAvÉ ¥ÉæÃgÉÃ¦¸ÀÄvÀÛzÉ.
- GvÀÛªÀÄ ¸ÀAªÀºÀ£À PÀ¯ÉAiÀÄ£ÀÄß ¨É¼É¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß FqÉÃj¸ÀÄvÀÛzÉ.

Course Content:

Unit-I **ªÀÄzsÀåPÁ°Ã£À PÁªÀå** **12 Hours**

1. ZÀAzÀæªÀÄw «¯Á¥À gÁWÀªÁAPÀ
2. ºÀUÉUÀ¼À£ÀÄ »ArzÀ£ÀÄ ªÀÄ£ÀzÉÆ¼ÀUÉ PÀÄªÀiÁgÀªÁå¸À
3. ªÀÄÄ½îrzÀ ªÀÄgÀ£ÉÃjzÀAvÁzÀÄzÀÄ ®QëöäÃ±À
4. UÉÆÃgÀPÀë ¥Àæ¸ÀAUÀ ZÁªÀÄgÀ¸À

Unit II **ªÀÄzsÀåPÁ°Ã£À PÁªÀå** **12 Hours**

1. wæ¥À¢UÀ¼ÀÄ ¸ÀªÀðdÕ
2. ªÀÄÄAzÀPÉÌ ¯ÉÃ¸ÀÄAlÄ £ÀªÀÄUÉ ºÉ¼ÀªÀ£À PÀmÉÖ VjAiÀÄªÀÄä
3. UÀÄgÀÄ«£À UÀÄ¯ÁªÀÄ£ÁUÀÄªÀ vÀ£ÀPÀ ¥ÀÄgÀAzÀgÀzÁ¸ÀgÀÄ
4. PÀgÉzÀÄ PÉÆlÖ£ÀÄ ±Á¥ÀªÀ£ÀÄ PÀ£ÀPÀzÁ¸ÀgÀÄ

Unit III **¯ÉÃR£ÀUÀ¼ÀÄ** **12 Hours**

1. ªÉÆÃPÀë ºÀÄqÀÄPÀÄvÀÛ ¦æÃwAiÀÄ §AzsÀ£ÀzÀ°è ¦. ®APÉÃ±À

2. gÁªÀÄ-PÀÈµÀÚ-²ªÀ ¯ÉÆÃ»AiÀiÁ
3. ªÀiÁ£À«ÃAiÀÄvÉ CAvÁgÀ¯Áè zÉÃªÀ£ÀÆgÀÄ ªÀÄºÁzÉÃªÀ
4. ¨sÀÆvÁ¬Ä ªÀÄÄ¤zÁ¼ÀÄ ªÀÄÄgÁj §¯Áè¼À

Unit IV ¥ÀæªÁ¸À PÀxÀ£À **12 Hours**

£À£ÉÆß¼ÀV£À ºÁqÀÄ PÀÆå¨Á f.J£ï. ªÉÆÃºÀ£ï

¥ÀgÁªÀÄ±Àð£À UÀæAxÀUÀ¼ÀÄ :

1. ªÀÄÄUÀ½ gÀA.²æÃ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ VÃvÁ §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 2014
2. ¹ÃªÀiÁwÃvÀ PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ ¸ÀA¥ÀÄl 1,2,3,4,5 ªÀÄvÀÄÛ 6, PÀÄªÉA¥ÀÄ PÀ£ÀßqÀ CzsÀåAiÀÄ£À ¸ÀA¸ÉÜ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ, ªÉÄÊ¸ÀÆgÀÄ. 2014
3. ºÀA¥À £ÁUÀgÁdAiÀÄå, ¸ÁAUÀvÀå PÀ«UÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
4. PÁ¼ÉÃUËqÀ £ÁUÀªÁgÀ, wæ¥À¢, gÀUÀ¼É ªÀÄvÀÄÛ eÁ£À¥ÀzÀ ¸Á»vÀå, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
5. ¸ÀA. ¨É£ÀUÀ¯ï gÁªÀÄ gÁªï ªÀÄvÀÄÛ ¥Á£ÀåA ¸ÀÄAzÀgÀ ±Á¹ÛçÃ, ¥ÀÄgÁt £ÁªÀÄ ZÀÆqÁªÀÄtÂ, ¥ÀæPÁ±ÀPÀgÀÄ ¥Àæ¸ÁgÁAUÀ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ. 2010
6. ¸ÀA. §¸ÀªÀgÁdÄ J¯ï. ¸ÀªÀðdÕ£À ªÀZÀ£ÀUÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ VÃvÁ §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 2012
7. ªÀÄgÀÄ¼À¹zÀÝ¥Àà PÉ, µÀlà¢ ¸Á»vÀå, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
8. ¸ÀA. ¸ÉÃvÀÄgÁªÀÄ gÁªï C.gÁ., ²æÃ ®Qëöä±À£À eÉÊ«Ä¤ ¨sÁgÀvÀ(ªÀÄÆ®-vÁvÀàAiÀÄð-¸ÀavÀæ), ¥ÀæPÁ±ÀPÀgÀÄ PÁªÀÄzsÉÃ£ÀÄ ¥ÀÄ¸ÀÛPÀ ¨sÀªÀ£À, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
9. ¸ÀA. f.J¸ï.¨sÀmï., PÀÄªÀiÁgÀªÁå¸À£À PÀuÁðl ¨sÁgÀvÀ PÀxÁªÀÄAdj ¥ÀæªÉÃ±À, ¥ÀæPÁ±ÀPÀgÀÄ CPÀëgÀ ¥ÀæPÁ±À£À, ºÉUÉÆÎÃqÀÄ, ¸ÁUÀgÀ. 2006
10. QÃvÀð£ÁxÀ PÀÄvÀðPÉÆÃn, PÀ£ÀßqÀ ¸Á»vÀå ¸ÀAUÁw, ¥ÀæPÁ±ÀPÀgÀÄ PÀÄvÀðPÉÆÃn ªÉÄªÉÆÃjAiÀÄ¯ï læ¸ïÖ, zsÁgÀªÁqÀ. 2009
11. ±ÁªÀÄgÁAiÀÄ vÀ.¸ÀÄ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ vÀ¼ÀÄQ£À ªÉAPÀtÚAiÀÄå ¸ÁägÀPÀ UÀæAxÀªÀiÁ¯É, ªÉÄÊ¸ÀÆgÀÄ -2014
12. ²ªÀgÀÄzÀæ¥Àà f.J¸ï. PÀ£ÀßqÀ ¸Á»vÀå ¸À«ÄÃPÉë, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2013

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE201K/H/E	**Language: Hindi-II**	HC	2	1	0	3	3

<u>अध्ययन धिषय सूची / पाठ्यक्रम</u>

इकाई – 1: प्राि ीन कसिता, आधुसनक कसिता **अध्यापन अिधियाा ँ :** 12 hrs.

1.कबीर के दयहे
2.कसिता –जसलयाि ाला बाग मेंं बिंत- िुभद्राकु मारी िौहान
3.कसिता – िुभाष की मृिु पर - धमि ीर भारती
इकाई – 2: मध्यकालीन कसिता, आधुसनक कसिता **अध्यापन अिधियाा ँ :** 12 hrs.

4.रिि ान के दयहे
5.कसिता – हमारी सजन्दगी - के दारनाथ अग्रिाल
6.कसिता –िलना हमारा काम है।- सशिमंगल सिंह िुमन
इकाई – 3: मध्यकालीन कसिता, आधुसनक कसिता **अध्यापन अिधियाा ँ :** 12 hrs.

7.मीराबाई के पद
8.कसिता – मेरे िपने बहुत नहीं हैं- सगररराज कु मार माथुर
9.कसिता – अभी न हयगा मेरा अंत – सनराला
इकाई – 4: अनुि ाद, सनबंध **अध्यापन अिधियाा ँ :** 12 hrs.
अनुि ाद : सहन्दी – अंग्रेजी

धनबंि :
1.भारत में सकिानयं की खस्थसत
2.सनि ाि न आययग का महत्व
3.प्रेि की आजादी सकतनी ि ाथक
4.भारतीय नारी
5.ि ासहि का उद्देश्य

सन्दर् ग्रन्थ :

- पाठ्य पुस्तक – रेि ा सिश्वसिद्यालय
- िुबयध व्यिहाररक सहन्दी – िॉ. कु लदीप गुि
- असभनि व्यिहाररक सहन्दी – िॉ.परमानन्द गुि
- सहन्दी ि ासहि का इसतहाि - िॉ. नागेन्द्र
- आधुसनक सहन्दी ि ासहि का इसतहाि - िॉ. बच्चन सिंह
- सहन्दी ि ासहि का नि ीन इसतहाि - िॉ. लाल ि ाहब सिंह
- शुद्ध सहन्दी कै िे बयले कै िे सलिे- पृथ्वीनाथ पाण्डे
- कायालय अनुि ाद सनदेसशका
- सहन्दी सनबंध िंग्रह

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.

17JE201K/H/E	**Language: Additional English-II**	HC	2	1	0	3	3

Course Outline:

This is a 3 credit course designed to help the learner gain a deeper understanding of the society and the world at large, which will be not only beneficial for his professional competence but also contribute towards his/her social and cultural development.

Course Objectives:

- To help the student understand the multiple values of the society.
- To develop a cultural understanding in the student to sharpen his/her social skills.
- To ensure a gradual development of literary interest in the student.

Course Outcomes:

On completion of the course, learners will be able to:

- Demonstrate a deep understanding of the society and its values.
- Develop a constructive understanding of the cultural dimensions of the human world.
- Make use of his understanding to become a responsible global citizen of tomorrow.

Course Content:

Unit-I: Ecology & Environment **12 Hours**

Literature **-** Toru Dutt - Casuarina Tree
Robert Frost – Stopping by Woods on a Snowy Evening
Tomas Rivera–The Harvest
V. Raman – Water – The Elixir of Life
Language**:** Degrees of Comparison

Unit-II: Voices From The Margin **12 Hours**

Literature: Tadeusz Rozewicz – Pigtail
Jyoti Lanjewar – Mother
Sowvendra Shekhar Hansda – The Adivasi Will Not Dance
Harriet Jacobs – Excerpt from *Incidents in the Life of a Slave Girl*
Language: Prefix and Suffix

Unit-III: Women & Society **12 Hours**

Literature: Kamala Das – An Introduction
UshaNavrathnaram – To Mother
Rabindranath Tagore – The Exercise Book
Jamaica Kincaid – Girl
Writing Skills: Dialogue Writing

Unit-IV: Popular Culture **12 Hours**

Literature: Rudyard Kipling – The Absent-minded Beggar
Sir Arthur Conan Doyle – The Hound of the Baskervilles
Aldous Huxley – The Beauty Industry
Writing Skills: Story Writing

Reference Books:

1. Agrawal, K.A. *Toru Dutt the Pioneer Spirit of Indian English Poetry - A Critical Study*. Atlantic Publications, 2009.
2. Latham, Edward Connery (ed). *The Poetry of Robert Frost*. Holt Paperbacks, 2002.
3. Gale, Cengage Learning. *A Study Guide for Tomas Rivera's The Harvest*. Gale, Study Guides, 2017.
4. Basu, Tejan Kumar. *The Life and Times of C.V. Ram*an. PrabhatPrakashan, 2016.
5. Rozewicz, Tadeusz. *New Poems*. Archipelago, 2007.
6. Manohar, Murli. *Critical Essays on Dalit Literature*. Atlantic Publishers, 2013.
7. Hansda, SowvendraShekhar. *The Adivasi Will Not Dance: Stories*. Speaking Tiger Publishing Private Limited, 2017.
8. Jacobs, Harriet. *Incidents in the Life of a Slave Girl*. Createspace Independent Publication, 2014.
9. Das, Kamala. *Selected Poems*. Penguin Books India, 2014.
10. Tagore, Rabindranath. *Selected Short Stories of Rabindranath Tagore*. Maple Press, 2012.
11. Gale, Cengage Learning.*A Study Guide for Jamaica Kincaid's Girl*. Gale, Study Guides, 2017.
12. Kipling, Rudyard. *The Absent-Minded Beggar*. Hardpress Publishing, 2013.
13. Doyle, Arthur Conan. *The Hound of the Baskervilles*. General Press, 2017.
14. Dixson, Robert J. *Everyday Dialogues in English*. Prentice Hall India Pvt Ltd., 1988.
15. Turton, Nigel D. *ABC of Common Errors*. Mac Millan Publishers, 1995.
16. Samson, T. (ed.) *Innovate with English.* Cambridge University Press, 2010.
17. Kumar, E Suresh, J. Savitri and P Sreehari (ed). *Effective English*. Pearson Education, 2009.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE203	**Reporting & Editing**	HC	2	0	2	4	5

Course Description:

The course Reporting & Editing is structured to prepare students for careers in newspaper, magazine, convergence, or journalism education. It caters to students who want to gain proficiency on the content-providing side of the media. By offering hands-on, engaging courses such as Reporting,

Interview, Press Conference, Computer Assisted Reporting and Design for Print media, the Reporting and Editing program readies students to be leaders in their chosen field upon graduation.

Course Objectives:

- To help the students understanding the process of news gathering or print media
- To impart skills in writing and editing media content- news story, press release, headlines, photo-captions
- To gain knowledge about the various beats of journalism

Course Outcomes:

On completion of this course, the student would be able to:

- Develop skill in reporting for different beats and editing
- Develop practical knowledge on editing and prof reading
- Demonstrate the visual elements in print media

Course Content:

Unit I: Attributes of Print Journalism; 12 Hours

Journalism- Definition, nature and scope; News- Definition, elements, values, sources; Structure of a news story, lead, body; Types of leads; Inverted Pyramid style; Newsroom structure.

Unit II: Techniques of Reporting ; 12 Hours

Techniques of Reporting; Types and techniques; Beats of reporting-crime investigative, development, politics, sports, court, legislature, environment, business; Sources of news: Attribution and verification; Freelancing.

Unit III: Principles of Editing; 12 Hours

Introduction to editing; Principles of editing- Checking facts, correcting language, rewriting news stories, condensing stories; Headlines, Functions of headlines, Types of Headlines; Editorial page: structure, purpose, middles; Editorial Writing; Letters to the editor, Opinion pieces on OP. ED page.

Unit IV: Design Elements in Newspapers; 12 Hours

Cartoons and Caricatures: Political and Social; Info-graphics; Photo journalism-Types of photography: news, sports, profiles; photo editing; Typography; Caption writing; Caption writing.

Practical Component:

1. Reporting Exercise
2. Interview
3. Re-writing and Editing

4. Photo Editing and caption writing
5. Head Line writing
6. Page Lay out
7. News Letter
8. **Media Visit:** News paper/ Television channel offices.

References Books:

1. Desh Pandey, B.K. 2007. *Photo journalism*. New Delhi: Sonali Pubication.
2. Carole Rich. 2005. *Writing and Reporting news*. Wadsworth Thompson Learning Inc.
3. Pilger John 2004 (Edt). *Tell me no lies*. London :Vintage Publishers.
4. Jon & Lawis(Eds).2003. *The Mammoth Book of Journalism*.London:Robinsm Publishers.
5. R. Smith, Schumeman(Edt). 2000. *Photographic Communication: Principles Problem and challenges of Photo Journalism,*New York : Hasing House.
6. Kamath MV. 1991. *Professional Journalism,* Vikas Publication.
7. Desai M V and Ninan Sevanti .1996. *Beyond Those Headlines*.Bangalore: Allied Publishers Limited.
8. Westley Bruce. 1980. *News Editing*, Oxford IBH.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE204	**English Literature & Language – II (Semester II) British Literature (The Romantic Age) & Aspects of Language**	HC	4	0	0	4	4

Course Desription:

The course is designed to elevate the level of the initial learning of the UG students. The students by now are well acquainted with the basic concepts of literature and language and therefore can address a little complex literary themes and topics to equip themselves to deal with hard core academic texts in the current as well as the upcoming semesters. The main focus is given to the literature falling under the umbrella domain of Romantic period with special reference to the romantic school of poetry. The completion of the course will ensure an overarching competence in Romantic poetry and prose amongst the students.

Course Objectives:

- To enable the students to understand the context of the literary age and genre focused in the syllabus.

- To enable students understand and relate British literature chronologically in reference to select authors of the Romantic period.
- To appreciate the vivacity of the canon of British literature.

Course Outcomes:

On completion of the course, students will be able to:

- Identify the major poets of the Romantic period and their works in English Literature.
- Outline the various issues presented in the prose of the period.
- Demonstrate complete familiarity with the features of novels of the Romantic period.
- Illustrate a good understanding of the structure of sentences and discourse.

Course Content:

Unit-I: Poetry **12 Hours**

The Age of Transition:

1. William Blake – The Chimney Sweeper

The Romantic Age:

2. William Wordsworth – A Slumber did my spirit seal; Daffodils
3. Samuel Taylor Coleridge – Kubla Khan
4. Lord Byron – On This Day I Complete My Thirty-Sixth Year
5. Percy Bysshe Shelley – Ode to the West Wind
6. John Keats – Ode on a Grecian Urn

Unit-II: Prose **12 Hours**

1. Charles Lamb – Dream-Children: A Reverie
2. William Hazlitt – On the Feeling of Immortality in Youth
3. Percy Bysshe Shelley – Extract from *A Defence of Poetry*
4. Mary Wollstonecraft – Extract from *A Vindication of the Rights of Women*

Unit-III: Fiction **12 Hours**

1. Ann Radcliffe – *The Mysteries of Udolpho*
2. Jane Austen – *Pride and Prejudice*

Unit-IV: Language **12 Hours**

1. The Structure of Sentences
2. Discourse

Reference Books:

1. Wordsworth, Jonathan. *The Penguin Book of Romantic Poetry*. Penguin, 2006.

2. Applebaum, Stanley. *English Romantic Poetry: An Anthology*. Dover, 1996.
3. Driver, Paul. *Poetry of the Romantics*. Penguin, 2000.
4. Blaisdell, Bob. *Great English Essays: From Bacon to Chesterton*. Dover, 2005.
5. Wollstonecraft, Mary, *Vindication of the Rights of Women*. Penguin, 2010.
6. Sinha, Susanta K. *English Essayists*. Oxford University Press, 1997.
7. Austen, Jane. *Pride and Prejudice*. Penguin, 2009.
8. Radcliffe, Ann. *The Mysteries of Udolpho*. Penguin, 2001.
9. Green, David. *Contemporary English Grammar Structures and Composition*. New Delhi: MacMillan Publishers, 2010.
10. Leech, Geoffrey and Jan Svartvik. *A Communicative Grammar of English*. Longman, 2003.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
7JE205	**Foundations of Psychology -II**	HC	2	0	2	4	5

Course Description:

This course is designed to give students an overview of what psychological science has discovered about human behavior and mental processes over the past century. An evolutionary, functional perspective will be applied across the many fields of psychology. Students will gain an understanding of the psychological phenomena that occur in daily life as well as the practical applications of psychological knowledge. This course is designed to give other basic aspects of psychology such as sensational aspects, perceptual process, attentional process, personality and its overview, thinking process and intellectual aspects of human being.

Course Objectives:

- To introduce the student to the field of sensory processes, perceptual processes and attentional processes.
- To familiarize them with study of personality and its development.
- To help the student to collect and analyze about how our thinking processes involved in different cognitive abilities.
- To help the students with the study of intelligence and its different components.

Learning Outcomes:

On completion of the course, the students will be able to:

- Gain an understanding of the sensory aspects, perceptual processes, and attentional aspects of human beings.
- Able to understand the concept personality, factors influencing, different components of personality.
- Gain an understanding of how our thinking process involved in our cognitive abilities.
- Gain an understanding the concept of intelligence and its components.

Course Content:

Unit-I: Sensation And Perception **12 hours**

a) Sensation - Nature and steps in sensation.. Purposes of sensation, sensory receptors and the brain; Sensory adaptation. Types of sensation: **Vision.**

b) Perception – Nature and meaning of perception; Gestalt laws of perceptual organization, The Constancies (Size, Shape and Brightness); Depth perception; Errors in perception.
c) Attention: definition, Characteristics, Types of attention.

Unit-II: Personality **12 hours**

a) Nature and definition of personality (Allport's definition).
b) Factors influencing on development of personality.
c) Approaches to personality theories.

Psychodynamic Perspectives: Freud and Jung's thoery
Trait approaches: NEO-5 theory.
Social Learning theory: Bandura's theory of Personality.
Humanistic Approach: Roger's Theory.

d) Measurement of personality: Objective Measurement: Questionnaires, rating scales. Projective Techniques.

Unit-III: Thinking **12 hours**

Nature and definition of thinking, Cognition. Forms of thinking: Concept formation, Categorization, Problem solving, Reasoning, Decision making, Creativity.

Unit-IV: Intelligence **12 hours**

a) Intelligence in historical perspective
b) Broader conceptions of Intelligence: Spearman's two factor theory, Sternberg's triarchic theory, Multiple Intelligences, Guilford's theory.
d) Types of intelligence tests.
e) Role of Heredity and Environment in intelligence
f) Extremes of Intelligence.

Practicals-II

1. Signal detection

2. Stroop effect
3. Bilateral Transfer
4. Muller Lyer Illusion
5. Concept Formation/Levels of Categorization

References Books:

1. Robert S. *Feldman* (2004) *understanding Psychology* 6th *Edition* Tata MrGram – Hill.
2. Saundra K Ciccarelli and Glenn E Meyer (2008), Psychology, South Asia Edition,
3. Robert A Baron (2001), Psychology, III Edition, Prentice Hall Publications
4. John. W. Santrock (2006), Psychology Essentials, 2nd Edition Tata Mc Graw Hill
5. Hillgord & Atkinson (2009), Introduction to Psychology Oxford IBH publishing Co. Pvt. Ltd.
6. Morgan, King (2004), Introduction to Psychology, VII Edition, 1989, Mc Graw Hill IBH Publication

THIRD SEMESTER

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE301K/H/E	**Language: Kannada-III**	HC	2	1	0	3	4

Course Outline:

¨sÁµÉAiÀÄ£ÀÄß ªÀiÁvÀ£ÁqÀÄªÀ §gÉAiÀÄÄªÀ PË±À®å, ¸Á»vÀåzÀ §UÉÎ ¸ÀÆÜ®ªÁV ¥ÀjZÀ¬Ä¸ÀÄªÀ ªÀÄÆ®PÀ «zÁåyðUÀ¼À ªÀåQÛvÀé «PÁ¸À ºÁUÀÄ ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èlÄÖPÉÆAqÀÄ, ¥Àæ¸ÀÄÛvÀ ¸ÀAzÀ¨sÀðPÉÌ «zÁåyðUÀ¼À£ÀÄß ¸ÀdÄÓUÉÆ½¸À®Ä ¥ÀoÀåªÀ£ÀÄß gÀÆ¦¸À¯ÁVzÉ. PÀ¯É ªÀÄvÀÄÛ «eÁÕ£ÀzÀ «ZÁgÀUÀ½UÉ MvÀÛ£ÀÄß ¤ÃqÀ¯ÁVzÉ. EzÀÄ ªÀÄÆgÀÄ PÉærmï ºÉÆA¢zÉ.

Course Objectives:

£Á®ÄÌ ¸É«Ä¸ÀÖgïUÀ¼À°è ¸ÀªÀÄUÀæ PÀ£ÀßqÀ ¸Á»vÀåªÀ£ÀÄß ¥ÀjZÀ¬Ä¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß ºÉÆA¢zÉ. CzÀgÀAvÉ ªÀÄÆgÀ£ÉAiÀÄ ¸É«Ä¸ÀÖgï£À°è ºÉÆ¸ÀUÀ£ÀßqÀ ¸Á»vÀå ¥ÀæPÁgÀUÀ¼ÁzÀ £ÀªÉÇÃzÀAiÀÄ, £ÀªÀå PÁªÀå, ¸ÀtÚPÀxÉUÀ¼ÀÄ ºÁUÀÄ £ÁlPÀ ¸Á»vÀåªÀ£ÀÄß ¥ÀoÀåªÀ£ÁßV DAiÉÄÌ ªÀiÁrPÉÆAqÀÄ, «zÁåyðUÀ¼À°è ¸Á»vÀåzÀ §UÉÎ ¸ÀzÀ©ügÀÄaAiÀÄ£ÀÄß ªÀÄÆr¸À¯ÁUÀÄvÀÛzÉ. ¸ÁA¸ÀÌøwPÀ w¼ÀÄªÀ½PÉAiÀÄ eÉÆvÉUÉ ªÀåQÛvÀé «PÀ¸À£ÀzÀ PÀqÉUÉ UÀªÀÄ£À ¤ÃqÀ¯ÁUÀÄvÀÛzÉ.

- ¨sÁµÉ, ¸Á»vÀå, EwºÁ¸À ªÀÄvÀÄÛ ¸ÀA¸ÀÌøwUÀ¼À£ÀÄß PÀ£ÀßqÀ, PÀ£ÁðlPÀPÉÌ ¸ÀA§A¢ü¹zÀAvÉ ¥ÀjZÀ¬Ä¸À¯ÁUÀÄvÀÛzÉ.
- «zÁåyðUÀ¼À ¸ÀªÀðvÉÆÃªÀÄÄR ¨É¼ÀªÀtÂUÉUÉ C£ÀÄªÁUÀÄªÀAvÉ ºÁUÀÆ CªÀgÀ°è ªÀiÁ£ÀªÀ ¸ÀA§AzsÀUÀ¼À §UÉÎ UËgÀªÀ, ¸ÀªÀiÁ£ÀvÉ ªÀÄÆr¹, ¨É¼É¸ÀÄªÀ ¤nÖ£À°è ¥ÀoÀåUÀ¼À DAiÉÄÌAiÀiÁVzÉ.

- CªÀgÀ°è ¸ÀÈd£À²Ã®vÉ, ±ÀÄzÀÞ ¨sÁµÉ, GvÀÛªÀÄ «ªÀÄ±Áð UÀÄt, ¤gÀUÀð¼À ¸ÀA¨sÁµÀuÉ, ¨sÁµÀt PÀ¯É ºÁUÀÆ §gÀºÀ PË±À®åUÀ¼À£ÀÄß ¨É¼É¸ÀÄªÀÅzÀÄ UÀÄjAiÀiÁVzÉ
- ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ½UÉ C£ÀÄPÀÆ®ªÁUÀÄªÀAvÀºÀ «µÀAiÀÄUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èèlÄÖPÉÆAqÀÄ ¸ÀÆPÀÛ ¥ÀoÀåUÀ¼À£ÀÄß DAiÉÄÌ ªÀiÁrPÉÆ¼Àî¯ÁVzÉ.

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Course Outcomes:

ºÉÆ¸ÀUÀ£ÀßqÀ ¸Á»vÀå ¥ÀæPÁgÀUÀ¼ÁzÀ £ÀªÉÇÃzÀAiÀÄ, £ÀªÀå PÁªÀå, ¸ÀtÚPÀxÉUÀ¼ÀÄ ºÁUÀÄ £ÁlPÀ ¸Á»vÀå PÀ°PÉAiÀÄ ªÀÄÆ®PÀ PÁ®zÀ ¹ÜvÀåAvÀgÀUÀ¼À£ÀÄß CzÀgÀ M¼À£ÉÆÃl UÀ¼À£ÀÄß ¨É¼É¸ÀÄvÀÛzÉ.

- ¸ÁªÀiÁfPÀ, gÁdQÃAiÀÄ, zsÁ«ÄðPÀ, ¸ÁA¸ÀÌøwPÀ ºÁUÀÆ °AUÀ¸ÀA§A¢ü «ZÁgÀUÀ¼ÉqÉ UÀªÀÄ£ÀºÀj¸ÀÄªÀÅzÀgÉÆA¢UÉ «zÁåyðUÀ¼À°è ZÀZÁð ªÀÄ£ÉÆÃ¨sÁªÀªÀÅ ¨É¼ÉAiÀÄÄvÀÛzÉ.
- fÃªÀ£ÀzÀ°è §gÀÄªÀ C©ü¥ÁæAiÀÄ ¨ÉÃzsÀUÀ¼ÀÄ, ¸ÀªÀÄ¸ÉåUÀ¼À£ÀÄß DzsÀÄ¤PÀ ¸ÀAzÀ¨sÀðzÀ°è ªÀiÁ£À«ÃAiÀÄvÉAiÉÆA¢UÉ ¤ªÀð»¸ÀÄªÀAvÉ ¥ÉæÃgÉÃ¦¸ÀÄvÀÛzÉ.
- GvÀÛªÀÄ ¸ÀAªÀºÀ£À PÀ¯ÉAiÀÄ£ÀÄß ¨É¼É¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß FqÉÃj¸ÀÄvÀÛzÉ.

Course Content:

Unit I **£ÀªÉÇÃzÀAiÀÄ PÀ«vÉUÀ¼ÀÄ** **12 Hours**

1. ªÀÄÄ¢AiÀÄ gÁªÀÄUËqÀ ©. JA. ²æÃ
2. ¨É¼ÀUÀÄ zÀ.gÁ. ¨ÉÃAzÉæ
3. PÀ°Ì PÀÄªÉA¥ÀÄ
4. gÀvÀß ¨ÉÃªÁ¹ð f. ¦. gÁdgÀvÀßA

Unit II **£ÀªÉÇÃzÀAiÀÄ ºÁUÀÄ £ÀªÀå PÀ«vÉUÀ¼ÀÄ** **12 Hours**

1. CªÀzsÀÆvÀ ¸ÀÄ.gÀA.JPÀÄÌAr
2. ªÀÄ£É¬ÄAzÀ ªÀÄ£ÉUÉ PÉ.J¸ï.£À
3. £À£Àß ºÀtvÉ f.J¸ï.J¸ï.
4. agÀAvÀ£À zÁºÀ ZÀ£Àß«ÃgÀ PÀt«

Unit III **¸ÀtÚ PÀxÉUÀ¼ÀÄ** **12 Hours**

1. ªÀÄÄzÀÝt ªÀÄ£ÉÆÃgÀªÉÄ ¸À¯Áè¥À ªÀÄÄzÀÝt
2. zÁ½ £ÀqÉzÁªÀ CuÁÚ CªÀÄgÉÃ±À £ÀÄUÀqÉÆÃtÂ
3. PÉÆ£ÉAiÀÄ VgÁQ ¤gÀAd£À
4. CªÀ£Àw vÉÃd¹é

Unit IV **£ÁlPÀ** **12 Hours**

«ÄÃrAiÀiÁ C£ÀÄªÁzÀ.: PÉ. ªÀÄgÀÄ¼À ¹zÀÞ¥Àà

¥ÀgÁªÀÄ±Àð£À UÀæAxÀUÀ¼ÀÄ :

1. ªÀÄÄUÀ½ gÀA.²æÃ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ VÃvÁ §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 2014
2. ¹ÃªÀiÁwÃvÀ PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ ¸ÀA¥ÀÄl 1,2,3,4,5 ªÀÄvÀÄÛ 6, PÀÄªÉA¥ÀÄ PÀ£ÀßqÀ CzsÀåAiÀÄ£À ¸ÀA¸ÉÜ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ, ªÉÄÊ¸ÀÆgÀÄ. 2014
3. qÁ. CgÀ«AzÀ ªÀiÁ®UÀwÛ, ¸Á»vÀå ¸ÀA¸ÀÌøw ªÀÄvÀÄÛ zÀ°vÀ ¥ÀæeÉÕ, ¥ÀæPÁ±ÀPÀgÀÄ PÀ£ÀßqÀ ¸Á»vÀå ¥ÀjµÀvÀÄÛ, ¨ÉAUÀ¼ÀÆgÀÄ. 2014
4. qÁ. F.J¸ï. DªÀÄÆgÀ, PÀ£ÀßqÀ PÀxÀ£À ¸Á»vÀå : PÁzÀA§j, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2016
5. QÃvÀð£ÁxÀ PÀÄvÀðPÉÆÃn, PÀ£ÀßqÀ ¸Á»vÀå ¸ÀAUÁw, ¥ÀæPÁ±ÀPÀgÀÄ PÀÄvÀðPÉÆÃn ªÉÄªÉÆÃjAiÀÄ¯ï læ¸ïÖ, zsÁgÀªÁqÀ. 2009
6. ¸ÀA. ©.J¸ï. PÉÃ±ÀªÀgÁªï. PÉÊ¯Á¸ÀA PÀ£ÀßqÀ £ÁlPÀUÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ CAQvÀ ¥ÀÄ¸ÀÛPÀ, ¨ÉAUÀ¼ÀÆgÀÄ. 2005
7. ±ÁªÀÄgÁAiÀÄ vÀ.¸ÀÄ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ vÀ¼ÀÄQ£À ªÉAPÀtÚAiÀÄå ¸ÁägÀPÀ UÀæAxÀªÀiÁ¯É, ªÉÄÊ¸ÀÆgÀÄ -2014
8. DzsÀÄ¤PÀ PÀ£ÀßqÀ PÁªÀå ¨sÁUÀ-2, PÀÄªÉA¥ÀÄ PÀ£ÀßqÀ CzsÀåAiÀÄ£À ¸ÀA¸ÉÜ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ, ªÉÄÊ¸ÀÆgÀÄ. 2004
9. ²ªÀgÀÄzÀæ¥Àà f.J¸ï. PÀ£ÀßqÀ ¸Á»vÀå ¸À«ÄÃPÉë, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2013

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE301K/H/E	Langiage: Hindi-III	HC	2	1	0	3	4

अध्ययन धिषय सूची / पाठ्यक्रम

इकाई – 1: न ाि क **:** एक और द्रयणाि ाय – ि ॉ. शंकर शेष **अध्यापन अि धिय ा ाँ :** 12 hrs.

ले ि क
पररि य प्रथम
दृश्य
सृ्वतीय दृश्य

इकाई – 2: नाि क **:** एक और द्रयणाि ाय **अध्यापन अि धिय ा ाँ :** 12 hrs.

तृतीय दृश्य
ि तुथ दृश्य

इका ई – 3: नाि क **:** एक और द्रयणाि ाय **अध्यापन अि धिय ा ाँ :** 12 hrs.

पं ि
म दृश्य
छठा दृश्य

इकाई – 4: अनु ि ाद**,** जन ि ं ि ार माध्यम **अध्यापन अि धिय ा ाँ :** 12 hrs.

अनु ि ाद : अं्रेजी - सहन्दी (ि म ा ि ार पतृ ि े ि ं ब ं सधत)

जनसंचार माध्यम : स्वरुप, उद्धि और सिका ि |

सन्दर ृ ग्रन्थ :

- एक और द्रयणाि ाय – ि ॉ. शंकर शेष
- मीसिय ा ले ि न एि ं जन ि ं ि ार – ि ॉ.ि ं जीि कु मार
- सहन्दी ि ासहि क ा इसतह ा ि - ि ॉ. नागेद्र
- आधुसनक सहन्दी ि ासहि क ा इसतह ा ि - ि ॉ. बच्चन सि ं ह
- सहन्दी ि ासहि क ा नि ीन इसतह ा ि - ि ॉ. ल ाल ि ाहब सि ं ह

- शुद्ध सहन्दी कैि ेि बयलेि कैि ेि सलिे- पृथ्वीनाथ पाण्डेि
- कायालय अनुिाद सनदेि सशका
- मीसिया सिमश – रामशरण जयशी

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE301K/H/E	Language: Additional English-III	HC	2	1	0	3	4

Course Outline:

This is a 3 credit course designed to help the learners gain competency in language and literature by exposing them to a variety of literary genres and in the process also develop their subjective perception of the society and the world at large.

Course Objectives:

- To ensure the development of the linguistic prowess of the students.
- To motivate the students to appreciate literature.
- To promote an appreciable reading habit among the students.

Course Outcomes:

On completion of the course, learners will be able to:

- Demonstrate a thorough understanding of sensitive and critical social issues.
- Develop their own ideas about their own society and culture.
- Express their own opinions in a coherent and communicable manner.

Course Content:

Unit-I: Gender & Identity **12 Hours**

Anne Sexton – Consorting with Angels
Eugene Field – The Doll's Wooing
Suniti Namjoshi – Extracts from *Feminist Fables*
Ruth Vanita & SaleemKidwai (ed) – *Same Sex Love in India* (Extract)
Charlotte Perkins Gilman – The Yellow

Unit-II: Love & Romance **12 Hours**

Alfred Noyes – The Highway Man
William Shakespeare – Sonnet 116
Frank Richard Stockton – The Lady or the Tiger?
Oscar Wilde – The Nightingale and the Rose
William Shakespeare – *Excerpt from Romeo and Juliet* (Balcony Scene)

Unit-III: War & Trauma **12 Hours**

Lord Alfred Tennyson – The Charge of the Light Brigade
TaufiqRafat – The Medal
Guy de Maupassant – Two Friends

Sadaat Hasan Manto – Toba Tek Singh
Bertolt Brecht – Excerpt from *Fear and Misery of the Third Reich*

Unit-IV: Children's Literature **12 Hours**

William Wordsworth – Three Years She Grew in Sun and Shower
D.H. Lawrence – Discord in Childhood
Hans Christian Anderson – The Snow Queen
Anna Sewell – *The Black Beauty* (Extract)
Rudyard Kipling – *The Jungle Book* (Extract)

Reference Books:

1. Sexton, Anne. *The Complete Poems*. Houghton Mifflin, 1999.
2. Namjoshi, Suniti. *Feminist Fables*. Spinifex Press, 1998.
3. Vanita, Ruth &SaleemKidwai (ed.) *Same Sex Love in India*. Penguin India, 2008.
4. Gilman, Charlotte Perkins. *The Yellow Wallpaper*. Rockland Press, 2017.
5. Gale, Cengage Learning. *A Study Guide for Alfred Noyes's "The Highwayman".* Gale, Study Guides, 2017. (Kindle Edition Available)
6. Shakespeare, William. *Poems and Sonnets of William Shakespeare*. Cosimo Classics, 2007.
7. Stockton, Frank Richard. *The Lady, or the Tiger?*Createspace Independent Publications, 2017.
8. Wilde, Oscar. *The Collected Works of Oscar Wilde*. Wordsworth Editions Ltd., 1997.
9. Shakespeare, William. *Romeo and Juliet*. Rupa, 2001.
10. Tennyson, Lord Alfred. *The Complete Works of Alfred Tennyson*. Forgotten Books, 2017.
11. Owen, Wilfred. *The Poems of Wilfred Owen*. Wordsworth Editions Ltd., 1994.
12. Maupassant, Guy de. *Guy de Maupassant-The Complete Short Stories*. Projapati, 2015.
13. Manto, SadaatHasan. *Manto: Selected Short Stories*. RHI, 2012.
14. Brecht, Bertolt. *Fear and Misery in the Third Reich*. Methuen Drama, 2012.
15. Ricks, Christopher. *Metaphysical Poetry*. Penguin, 2006.
16. Anderson, Hans Christian. *Fairy Tales by Hans Christian Anderson*. Read Books, 2010.
17. Sewell, Anna. *The Black Beauty*. Maple Press, 2014.
18. Kipling, Rudyard. *The Jungle Book.* Amazing Reads, 2018.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE304	**Audio-Visual Production**	HC	2	0	2	4	5

Course Description:

The course Audio-Visual Production is devised for students to become trained in the nuances of electronic media. Students acquire skill in various media types like radio, television, film, etc. By gaining theoretical exposure with hands on demonstration of the practical components, the students will become proficient Radio Jockey, Script-writer for TV and Radio, film-maker for short-films, etc.

Course Objectives:

- To help the students understanding the process of generating content for electronic media
- To impart skills in script-writing, radio jockeying, conceptualizing and producing audio-visual packages
- To impart the aspects of aesthetics and visual grammar alongside the technicalities of producing the content.

Course Outcomes:

On completion of this course, the student would be able to:

- Apply skill in script-writing for radio and television
- Outline the aesthetics and visual grammar in the audio-visual medium
- Assess the various genres of film and organizations related to cinema in India

Course Content:

Unit I: Radio Production **12 Hours**

Introduction to radio production; Writing for radio, Programme formats news, talk, features, interviews, discussions, documentaries, plays; Audio recording – types of microphones; Studio set up.

Unit II: Script-writing for Radio and TV **12 Hours**

Scripting: Scripting for radio and television programs – storyboard; logging the shots; Screen play: Classical, A/v script.

Unit III: Basics in TV Production; 12 Hours

Visual Grammar: Composition, subject, light; Camera control devices- Attributes of a good picture; Different types of shots- shot composition- scenes- sequence; Camera perspectives camera angles- camera movements.

Unit IV: Introduction to Film Studies 12 Hours

Introduction to Film - Film as an art form; aesthetics of film; . Types of films; documentary; newsreel; Educational film; Animation film; Feature film; Mainstream cinema; Cinema and society. Promoting film culture in India –film society movement; FTII; NFAI; NFDC ;KCA; Films Division; Directorate of Film Festivals; Film awards; Film appreciation.

Practical Component

- Know Your camera
- Script writing- Radio news, Television news
- TV script/Radio Script/ Film Script
- Short Movie/Documentary Making

References Books:

1. Singhal Arvind and Rogers Everett M., 2007 *India's Communication Revolution*, Sage Pub.
2. Kumar Keval J., 1994. *Mass Communication in India*, Jaico Publishing House, Mumbai.
3. Chatterji, P.C. 1987. *Broadcasting in India* New Delhi: Sage Pub
4. Hasan Seema, 2010. Mass *Communication: Principles And Concepts*. CBS Publishers & Distributors,
5. Shamsi Nayyar, 2006. *Encyclopedia of Electronic Media*, Anmol Publications Pvt. Limited

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE305	**English Literature & Language – III (Semester III) British Literature (Victorian & Modern) & Aspects of Language**	HC	2	1	0	3	4

Course Desription:

This course is designed to familiarize the students with literary works of significant authors from the Victorian and Modern period of the British literary canon. In order to master the history of English

literature, this course is extremely important. After completion of this course, the students will have a wholesome grasp over British literature in its full demeanor and he/she will be able to apprehend and appreciate other literary texts from multiple literary periods competently.

Course Objectives:

- To introduce the students to the literary works from Victorian and Modern period.
- To enable the students to understand key concepts of Victorianism and Modernism.
- To initiate them to the basic social and cultural theories of modern age.

Course Outcomes:

On completion of the course, the students will be able to:

- Identify the major poets of the Victorian and Modern periods and their works in English Literature.
- Outline the various issues presented in the prose of the periods.
- Demonstrate complete familiarity with the features of novels of the Victorian period.
- Illustrate a good understanding of the various components of Speech and Writing and Tenor and Domain.
- Show a good understanding of Stylistic Analysis.

Course Content:

Unit: I Poetry **12 Hours**

The Victorian Age:

1. Alfred Tennyson – Ulysses
2. Robert Browning – My Last Duchess
3. Christina Rossetti – Goblin Market
4. Mathew Arnold – Dover Beach

Modern Poetry:

5. W.B. Yeats – An Acre of Grass
6. W.H. Auden – The Shield of Achilles
7. T.S. Eliot – Prelude

Unit: I Prose **12 Hours**

1. D.H. Lawrence – The Rocking-Horse Winner
2. R.L. Stevenson – An Apology for Idlers
3. Virginia Woolf – Extract from *A Room of One's Own*
4. Lewis Carroll – Excerpt from *Alice's Adventures in Wonderland*

Unit: III Fiction **12 Hours**

1. Charles Dickens – *The Adventures of Oliver Twist*
2. Charlotte Bronte – *Jane Eyre*

IV: Language **12 Hours**

1. Speech and Writing
2. Tenor and Domain
3. Introduction to Style
4. Stylistic Analysis: A Framework

Reference Books:

1. Cunningham, Valentine. *Victorian Poetry*. Blackwell, 2003.
2. Negri, Paul. *English Victorian Poetry: An Anthology*. Dover, 1998.
3. Yeats, W.B. *WB Yeats: Collected Poems*. Vintage, 1990.
4. Eliot, T.S. *The Complete Poems and Plays of T.S. Eliot*. Faber, 2004.
5. Sen, S. *W.H. Auden: Selected Poems*. Unique Publishers, 2015.
6. Lawrence, D.H. *The Rocking Horse Winner*. Perfection Learning, 1982.
7. Woolf, Virginia. *A Room of One's Own*. Penguin, 2002.
8. Dickens, Charles. *Oliver Twist*. Norton, 2009.
9. Bronte, Charlotte. *Jane Eyre*. Penguin, 2002.
10. Green, David. *Contemporary English Grammar Structures and Composition*. New Delhi: MacMillan Publishers, 2010.
11. Leech, Geoffrey and Jan Svartvik. *A Communicative Grammar of English*. Longman, 2003.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE306	**Developmental Psychology - I**	HC	2	0	2	4	5

Course Description:

Social Psychology will provide you with an introduction to the field of social psychology. Social psychology is a subfield of the science of psychology that focuses on the perceptions, thoughts, feelings, and behaviors of individuals and groups within a social context. This course introduces students to the theory and research on the social factors that influence individual and group behaviour. Prosocial behaviour, aggression, interpersonal attraction, attitudes, prejudice are among the topics covered in the course. The course will include both individual and group work to facilitate awareness, understanding and application of social psychological principles and concepts. As this is a survey course, this class will give you a broad overview of the major theories and findings within social psychology.

Course Objectives:

- To introduce the historical and scientific origin and development of the field in the western and Indian context

- To help the students to demonstrate an understanding of the basic scientific method underlying social psychological research.
- To generate awareness about a general knowledge of the major theories and current findings within each of the research topics covered in this course.
- To delve in to major issues and concepts in the field of Social Psychology
- To help the students to recognize and appreciate how basic theory and experimental findings apply to everyday situations.

Course Outcomes:

After the completion of this course, a student will be able to:

- Demonstrate the ability to articulate independently and creatively about human Social Behavior and the cultural influences that affect our behavior.
- Understand the historical and scientific origin and development of the field in the western and Indian context.
- Describe, discuss and analyze major issues and concepts in the field of Social Psychology.
- Demonstrate the ability to state the fundamental principles of Social Psychology.
- Describe the development of the self and the dynamics of interpersonal attraction, prosocial behaviour, aggression, prejudice, group processes and attitude formation and change in a social context.
- Comprehend the nature of scientific methods employed to study behaviour in the social context.

Course Content:

Unit-I: Introduction 12 Hours

a) Definition; History- Origin and Development.
b) Social psychology in India;
c) Theories - Cognitive, Decision making, Interdependence, Socio-cultural, Evolutionary, and Mid-range theories.

Unit-II: Social Perception 12 Hours

a) Self concept – Beginnings, Formation, Self- schemas and Multicultural perspective
b) Self- presentation - False modesty, Self-handicapping, Impression management. Self-esteem- Development and Consequences.
c) Perceiving persons- Attribution theories and biases, Integration, Confirmation bias

Unit-III: Positive Social Relations And Negative Social Relations 12 Hours

a) Prosocial behavior – Helping influences - Personal, Interpersonal and Situational, Receiving help. Interpersonal attraction and affiliation – Characteristics of the individual, others and situational influences.

b) Perceiving groups- Stereotypes – Cognitive foundations, how stereotypes distort perceptions; why stereotypes persist; Prejudices- Individual differences; Types of prejudices – Sexism and Racism; Reducing prejudice.

Unit-IV: Social InfluencES **12 Hours**

Attitudes – Definition; Theories – Cognitive Dissonance and Dual Processing; Attitude and Behaviour; Attitude change.

Group - Basic features; Group performance – Types of tasks, Brainstorming; Group decision making; Group polarization, and Group think.

Practicals-III

a. Learning Styles -VARK
b. Student Problem Checklist
c. Free Association
d. Paired Association Learning
e. Creativity

Reference Books:

1. Brehm, S.S. and Kassin, SN. (1996) *Social Psychology* , 3rd edition. Boston : Houghton Mifflin Company.
2. Crisp, R.J. and Turner, R.N. (2007), *Essential Social Psychology*. *N*ew Delhi: Sage Publications India Pvt Ltd.
3. Misra,G. and Dalal,A.K. (2001).*Social Psychology in India: Evolution and Emerging trends.* Edited by Ajit.K.Dalal and Girishwar Misra.New Directions in Indian Psychology,Volume I:Social Psychology.New Delhi: Sage Publications India Pvt.Ltd.
4. Myers, D.G (2002) *Social Psychology*, 7th international edition.New York: McGraw Hill Companies.
5. Taylor ,S .E, Peplau, L.A and Sears, D.O. (2006) *Social Psychology*, 12th edition.New Delhi: Pearson Prentice-Hall of India Pvt Ltd.
6. Baron, Robert A. and Byrne, D. (2001) .*Social Psychology* 8th Edition (Reprint).New Delhi : Prentice-Hall of India Pvt Ltd.
7. Baumeister.R.F. and Bushman,B.J. (2008).*Social Psychology and Human nature*.Belmont,CA: Thomson Wadsworth

FOURTH SEMESTER

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE401K/H/E	**Language-Kannada-IV**	HC	2	1	0	3	4

Course Outline:
¨sÁµÉAiÀÄ£ÀÄß ªÀiÁvÀ£ÁqÀÄªÀ §gÉAiÀÄÄªÀ PË±À®å, ¸Á»vÀåzÀ §UÉÎ ¸ÀÆÜ®ªÁV ¥ÀjZÀ¬Ä¸ÀÄªÀ ªÀÄÆ®PÀ «zÁåyðUÀ¼À ªÀåQÛvÀé «PÁ¸À ºÁUÀÄ ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èlÄÖPÉÆAqÀÄ, ¥Àæ¸ÀÄÛvÀ ¸ÀAzÀ¨sÀðPÉÌ «zÁåyðUÀ¼À£ÀÄß ¸ÀdÄÓUÉÆ½¸À®Ä ¥ÀoÀåªÀ£ÀÄß gÀÆ¦¸À¯ÁVzÉ. PÀ¯É ªÀÄvÀÄÛ «eÁÕ£ÀzÀ «ZÁgÀUÀ½UÉ MvÀÛ£ÀÄß ¤ÃqÀ¯ÁVzÉ. EzÀÄ ªÀÄÆgÀÄ PÉærmï ºÉÆA¢zÉ.

Course Objectives:

£Á®ÄÌ ¸É«Ä¸ÀÖgïUÀ¼À°è ¸ÀªÀÄUÀæ PÀ£ÀßqÀ ¸Á»vÀåªÀ£ÀÄß ¥ÀjZÀ¬Ä¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß ºÉÆA¢zÉ. CzÀgÀAvÉ £Á®Ì£ÉAiÀÄ ¸É«Ä¸ÀÖgï£À°è ºÉÆ¸ÀUÀ£ÀßqÀ ¸Á»vÀå ¥ÀæPÁgÀUÀ¼ÁzÀ £ÀªÀå, ¹ÛçÃªÁ¢ ºÁUÀÄ £ÀªÉÇåÃvÀÛgÀ PÁªÀå, ««zsÀ ¯ÉÃR£ÀUÀ¼ÀÄ ºÁUÀÄ PÁzÀA§j ¸Á»vÀåªÀ£ÀÄß ¥ÀoÀåªÀ£ÁßV DAiÉÄÌ ªÀiÁrPÉÆAqÀÄ, «zÁåyðUÀ¼À°è ¸Á»vÀåzÀ §UÉÎ ¸ÀzÀ©ügÀÄaAiÀÄ£ÀÄß ªÀÄÆr¸À¯ÁUÀÄvÀÛzÉ. ¸ÁA¸ÀÌøwPÀ w¼ÀÄªÀ½PÉAiÀÄ eÉÆvÉUÉ ªÀåQÛvÀé «PÀ¸À£ÀzÀ PÀqÉUÉ UÀªÀÄ£À ¤ÃqÀ¯ÁUÀÄvÀÛzÉ.

- ¨sÁµÉ, ¸Á»vÀå, EwºÁ¸À ªÀÄvÀÄÛ ¸ÀA¸ÀÌøwUÀ¼À£ÀÄß PÀ£ÀßqÀ, PÀ£ÁðlPÀPÉÌ ¸ÀA§A¢ü¹zÀAvÉ ¥ÀjZÀ¬Ä¸À¯ÁUÀÄvÀÛzÉ.
- «zÁåyðUÀ¼À ¸ÀªÀðvÉÆÃªÀÄÄR ¨É¼ÀªÀtÂUÉUÉ C£ÀÄªÁUÀÄªÀAvÉ ºÁUÀÆ CªÀgÀ°è ªÀiÁ£ÀªÀ ¸ÀA§AzsÀUÀ¼À §UÉÎ UËgÀªÀ, ¸ÀªÀiÁ£ÀvÉ ªÀÄÆr¹, ¨É¼É¸ÀÄªÀ ¤nÖ£À°è ¥ÀoÀåUÀ¼À DAiÉÄÌAiÀiÁVzÉ.
- CªÀgÀ°è ¸ÀÈd£À²Ã®vÉ, ±ÀÄzÀÞ ¨sÁµÉ, GvÀÛªÀÄ «ªÀÄ±Áð UÀÄt, ¤gÀUÀð¼À ¸ÀA¨sÁµÀuÉ, ¨sÁµÀt PÀ¯É ºÁUÀÆ §gÀºÀ PË±À®åUÀ¼À£ÀÄß ¨É¼É¸ÀÄªÀÅzÀÄ UÀÄjAiÀiÁVzÉ
- ¸ÀàzsÁðvÀäPÀ ¥ÀjÃPÉëUÀ½UÉ C£ÀÄPÀÆ®ªÁUÀÄªÀAvÀºÀ «µÀAiÀÄUÀ¼À£ÀÄß UÀªÀÄ£ÀzÀ°èèlÄÖPÉÆAqÀÄ ¸ÀÆPÀÛ ¥ÀoÀåUÀ¼À£ÀÄß DAiÉÄÌ ªÀiÁrPÉÆ¼Àî¯ÁVzÉ.

Course Outcomes:

ºÉÆ¸ÀUÀ£ÀßqÀ ¸Á»vÀå ¥ÀæPÁgÀUÀ¼ÁzÀ £ÀªÀå-£ÀªÉÇåÃvÀÛgÀ PÁªÀå, ««zsÀ ¯ÉÃR£ÀUÀ¼ÀÄ ºÁUÀÄ PÁzÀA§j ¸Á»vÀå PÀ°PÉAiÀÄ ªÀÄÆ®PÀ PÁ®zÀ ¹ÜvÀåAvÀgÀUÀ¼À£ÀÄß CzÀgÀ M¼À£ÉÆÃl UÀ¼À£ÀÄß ¨É¼É¸ÀÄvÀÛzÉ.

- ¸ÁªÀiÁfPÀ, gÁdQÃAiÀÄ, zsÁ«ÄðPÀ, ¸ÁA¸ÀÌøwPÀ ºÁUÀÆ °AUÀ¸ÀA§A¢ü «ZÁgÀUÀ¼ÉqÉ UÀªÀÄ£ÀºÀj¸ÀÄªÀÅzÀgÉÆA¢UÉ «zÁåyðUÀ¼À°è ZÀZÁð ªÀÄ£ÉÆÃ¨sÁªÀªÅ ¨É¼ÉAiÀÄÄvÀÛzÉ.

- fÃªÀ£ÀzÀ°è §gÀÄªÀ C©ü¥ÁæAiÀÄ ¨ÉÃzsÀUÀ¼ÀÄ, ¸ÀªÀÄ¸ÉåUÀ¼À£ÀÄß DzsÀÄ¤PÀ ¸ÀAzÀ¨sÀðzÀ°è ªÀiÁ£À«ÃAiÀÄvÉAiÉÆA¢UÉ ¤ªÀð»¸ÀÄªÀAvÉ ¥ÉæÃgÉÃ¦¸ÀÄvÀÛzÉ.
- ¸ÁªÀiÁfPÀ CjªÀÅ ªÀÄÆr¸ÀÄvÀÛzÉ.
- GvÀÛªÀÄ ¸ÀAªÀºÀ£À PÀ¯ÉAiÀÄ£ÀÄß ¨É¼É¸ÀÄªÀ GzÉÝÃ±ÀªÀ£ÀÄß FqÉÃj¸ÀÄvÀÛzÉ.

COURSE CONTENT:

Unit I **£ÀªÀå-¹ÛçÃªÁ¢ PÀ«vÉUÀ¼ÀÄ** **12 Hours**

1. PÀlÄÖªÉªÀÅ £ÁªÀÅ CrUÀgÀÄ
2. §Ä¢ÞªÀAvÀjUÉ PÀ£À¸ÀÄ ©zÀÝgÉ J.PÉ.gÁªÀÄ£ÀÄd£ï
3. PÀÄjUÀ¼ÀÄ ¸Ágï PÀÄjUÀ¼ÀÄ ¤¸Ágï CºÀªÀÄzï
4. £Á §j ¨sÀÆætªÀ®è ªÀiÁ®w ¥ÀlÖt±ÉnÖ

Unit II **zÀ°vÀ-§AqÁAiÀÄ** **12 Hours**

1. ¸ÁévÀAvÀæ VÃvÉ ZÀA¥Á
2. d£À¥ÀzÀ PÀxÉUÀ¼À gÁPÀë¸À PÀA¨ÁgÀ
3. zÀ°vÀgÀÄ §gÀÄªÀgÀÄ zÁj©r ¹zÀÞ°AUÀAiÀÄ
4. PÀlÖqÀzÀ PÉ®¸ÀUÁgÀgÀÄ JZï J¸ï ²ªÀ¥ÀæPÁ±À

Unit III **¯ÉÃR£ÀUÀ¼ÀÄ** **12 Hours**

1. ºÀ¹gÀÄ ºÉÆ¸ÀPÀÄªÀ UÀtÂUÀ¼ÀÄ AiÀÄ®è¥Àà gÉrØ
2. ªÀZÀ£ÀPÁgÀgÀ «ZÁgÀ PÁæAw f.J¸ï.J¸ï
3. eÁUÀwÃPÀgÀtzÀ »£Éß¯ÉAiÀÄ°è UÁA¢üÃfAiÀÄ ¥Àæ¸ÀÄÛvÀvÉ ¹. £ÁUÀtÚ
4. §AqÀªÁ¼À ±Á» £É¯É §gÀUÀÆgÀÄ

Unit IV **PÁzÀA§j** **12 Hours**

¸ÀA¸ÁÌgÀ C£ÀAvÀªÀÄÆwð

¥ÀgÁªÀÄ±Àð£À UÀæAxÀUÀ¼ÀÄ :

1. ªÀÄÄUÀ½ gÀA.²æÃ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ VÃvÁ §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 2014
2. ¹ÃªÀiÁwÃvÀ PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ ¸ÀA¥ÀÄl 1,2,3,4,5 ªÀÄvÀÄÛ 6, PÀÄªÉA¥ÀÄ PÀ£ÀßqÀ CzsÀåAiÀÄ£À ¸ÀA¸ÉÜ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ, ªÉÄÊ¸ÀÆgÀÄ. 2014
3. ºÀA¥À £ÁUÀgÁdAiÀÄå, ¸ÁAUÀvÀå PÀ«UÀ¼ÀÄ, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2010
4. gÀAeÁ£ï zÀUÁð, ±ÀgÀtgÀ ¸ÀªÀÄUÀæ PÁæAw, ¥ÀæPÁ±ÀPÀgÀÄ. ¯ÉÆÃ»AiÀiÁ ¥ÀæPÁ±À£À, §¼Áîj. 2015
5. ªÀ¹µÀ×., gÀvÁßPÀgÀªÀtÂðAiÀÄ ¨sÀgÀvÉÃ±À ªÉÊ¨sÀªÀ, ¥ÀæPÁ±ÀPÀgÀÄ ZÉÃvÀ£À §ÄPï ºË¸ï, ªÉÄÊ¸ÀÆgÀÄ. 1999
6. qÁ. CgÀ«AzÀ ªÀiÁ®UÀwÛ, ¸Á»vÀå ¸ÀA¸ÀÌøw ªÀÄvÀÄÛ zÀ°vÀ ¥ÀæeÉÕ, ¥ÀæPÁ±ÀPÀgÀÄ PÀ£ÀßqÀ ¸Á»vÀå ¥ÀjµÀvÀÄÛ, ¨ÉAUÀ¼ÀÆgÀÄ. 2014

7. qÁ. F.J¸ï. DªÀÄÆgÀ, PÀ£ÀßqÀ PÀxÀ£À ¸Á»vÀå : PÁzÀA§j, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2016
8. QÃvÀð£ÁxÀ PÀÄvÀðPÉÆÃn, PÀ£ÀßqÀ ¸Á»vÀå ¸ÀAUÁw, ¥ÀæPÁ±ÀPÀgÀÄ PÀÄvÀðPÉÆÃn ªÉÄªÉÆÃjAiÀÄ¯ï læ¸ïÖ, zsÁgÀªÁqÀ. 2009
9. ±ÁªÀÄgÁAiÀÄ vÀ.¸ÀÄ., PÀ£ÀßqÀ ¸Á»vÀå ZÀjvÉæ, ¥ÀæPÁ±ÀPÀgÀÄ vÀ¼ÀÄQ£À ªÉAPÀtÚAiÀÄå ¸ÁägÀPÀ UÀæAxÀªÀiÁ¯É, ªÉÄÊ¸ÀÆgÀÄ -2014
10. ¸ÀA. qÁ! ¹. Dgï. ZÀAzÀæ±ÉÃRgï, ªÀÄÄAzÁ¼ÀÄvÀ£ÀzÀ ®PÀëtUÀ¼À£ÀÄß ¨É¼É¹PÉÆ¼ÀÄîªÀÅzÀÄ ºÉÃUÉ?, ¥ÀæPÁ±ÀPÀgÀÄ £ÀªÀPÀ£ÁðlPÀ ¥À©èPÉÃµÀ£ïì ¥ÉæöÊªÉmï °«ÄmÉqï. 2010
11. DzsÀÄ¤PÀ PÀ£ÀßqÀ PÁªÀå ¨sÁUÀ-2, PÀÄªÉA¥ÀÄ PÀ£ÀßqÀ CzsÀåAiÀÄ£À ¸ÀA¸ÉÜ, ªÉÄÊ¸ÀÆgÀÄ «±Àé«zÁå¤®AiÀÄ, ªÉÄÊ¸ÀÆgÀÄ. 2004
12. ²ªÀgÀÄzÀæ¥Àà f.J¸ï. PÀ£ÀßqÀ ¸Á»vÀå ¸À«ÄÃPÉë, ¥ÀæPÁ±ÀPÀgÀÄ ¸Àé¥Àß §ÄPï ºË¸ï, ¨ÉAUÀ¼ÀÆgÀÄ. 2013

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE401K/H/E	**Language-Hindi-IV**	HC	2	1	0	3	4

<u>अध्ययन धिषय सूची / पाठ्यक्रम</u>

इकाई – 1: ि ं ि काव्य – ि ंशय की रात - नरेश मेहता **अध्यापन अिधियाँ :** 12 hrs.

कसि पररिय
प्रथम िग
सद्वतीय िग

इकाई – 2: ि ं ि काव्य – ि ंशय की रात **अध्यापन अिधियाँ :** 12 hrs.

तृतीय िग
ि तुथ िग

इका ई – 3: ि ं ि काव्य – ि ंशय की रात **अध्यापन अिधियाँ :** 12 hrs.

पं ि
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इकाई – 4: व्याकरण : अलंकार , **धसधनमा ररव्यू** **अध्यापन अिधियाँ :** 12 hrs.

व्याकरण : अलंकार
धसधनमा ररव्यू :

दंगल ,सहन्दी मीसियम, और ि◌ेक दे इंसिया |
ि◌ि◌ाग्रह

सन्दर्ग्रन्थ :

1. ि◌ंशय क◌ी एक रात – नरे◌श मे◌हत◌ा
2. सहन्दी ि◌ासहि क◌ा इसतह◌ाि - ि◌ॉ. नागे◌द्र
3. आध◌ुसनक सहन्दी ि◌ासहि क◌ा इसतह◌ाि - ि◌ॉ. बच्चन सि◌ंह
4. सहन्दी ि◌ासहि क◌ा नि◌ीन इसतह◌ाि - ि◌ॉ. ल◌ाल ि◌ाहब सि◌ंह
5. श◌ुद्ध सहन्दी कै ि◌े बयले कै ि◌े सल ि◌े- प◌ृथ्वीनाथ पाण्ड◌े
6. भारतीय ि◌ंस्क◌ृ सत के आध◌ार - सिद्धासनि◌ाि समश्रा
7. रामायण क◌ी कहासनय◌ा - हष◌ा शम◌ा
8. रि छं द और अल◌ंक◌ार - क◌ृ ष्णद◌े ि◌ शम◌ा और ि◌ुरे◌श अग्र◌ि◌ाल

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE401K/H/E	**LANGUAGE- ADDITIONAL ENGLISH-**	HC	2	1	0	3	4

Course Outline:

This is a 3 credit course designed to help the learners gain competency in language and literature by exposing them to a larger variety of literary genres and themes to encourage their interests in critical social and cultural issues within literary as well as non-literary domains.

Course Objectives:

- To introduce the students to the multiplicity of literature from all over the world.
- To contribute in the emotional and social development of the students.
- To develop in the students an ability to appreciate cultural and social diversity.

Course Outcomes:

On completion of the course, learners will be able to:

- Demonstrate a visible understanding of the significant issues of the society.
- Summarize the basic as well as the latent concepts of the texts provided in the syllabus and do justice to them.
- Explain the major and minor themes of the select texts and their significance in the broader context of real life.

Course Content:

Unit-I: Myths & Mythology **12 Hours**

John W. May – Narcissus

W.B. Yeats – The Second Coming

DevduttPattanaik - *Shikhandi and the Other Stories They Don't Tell you* (Extracts)

IravatiKarve – *Yuganta* (Extract)

Unit-II: Family & Relationships **12 Hours**

Nissim Ezekiel – Night of the Scorpion
Langston Hughes – Mother to Son
Vijay Dan Detha – Double Life
Kate Chopin – The Story of an Hour
Henrik Ibsen – *A Doll's House* (Extract)

Unit-III: Horror & Suspense **12 Hours**

Nissim Ezekiel – Night of the Scorpion
Langston Hughes – Mother to Son
Vijay Dan Detha – Double Life
Kate Chopin – The Story of an Hour
Henrik Ibsen – *A Doll's House* (Extract)

Unit-IV: Education **12 Hours**

The Dalai Lama – The Paradox of Our Times
Kamala Wijeratne – To a Student
Sudha Murthy – In Sahyadri Hills, a Lesson in Humility
Booker T. Washington – Extract from *Up from Slavery* (Chapter 3: The Struggle for Education)
FrigyesKarinthy – *Refund*

Reference Books:

1. Finneran, Richard J. *The Collected Works of W.B. Yeats*(Volume I: The Poems: Revised Second Edition). Simon & Schuster, 1996.
2. Pattanaik, Devdutt. *Shikhandi: Ánd Other 'Queer' Tales They Don't Tell You*. Penguin Books, 2014.
3. Karve, Irawati. *Yuganta: The End of an Epoch*. Orient Blackswan, 2007.
4. Ezekiel, Nissim. *Collected Poems* (With A New Introduction By John Thieme). OUP, 2005.
5. Hughes, Langston. *The Collected Poems of Langston Hughes*. Vintage, 1995.
6. Chopin, Kate. *The Awakening and Selected Stories of Kate Chopin*. Simon & Schuster, 2004.
7. Ibsen, Henrik. *A Doll's House*. Maple Press, 2011.
8. Poe, Edgar Allan. *The Complete Poetry of Edgar Allan Poe*. Penguin USA, 2008.
9. Stoker, Bram. *Dracula*. Fingerprint Publishing, 2013.
10. Ray, Satyajit. *The Complete Adventures of Feluda* (Vol. 2). Penguin Books Ltd., 2015.
11. Lama, Dalai. *Freedom In Exile: The Autobiography of the Dalai Lama of Tibet*. Little, Brown Book Group, 1998.
12. Murthy, Sudha. *Wise and Otherwise: A Salute to Life*. Penguin India, 2006.
13. Wsahington, Booker T. *Up from Slavery*. Infinity, 2015.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE402	**Fundamentals of Media Research**	HC	2	0	2	4	5

Course Description:

The course is aimed at acquainting and initiating the student to the nuances – theoretical & practical – involved in research. Each student is assigned a supervisor who will supervise and guide the project/dissertation of not less than 35 - 40 pages which the student is required to submit at the end of semester in the prescribed format. This will aid the students in gaining a proper insight into research in communication studies and devising the project will impart clarity in the nuances of doing research.

Course Objectives:

- To expose students to the theory and mechanics of conducting research
- To provide students with knowledge on the fundamental aspects of research

Course Outcomes:

On completion of the course, the student will be able to

- Outline the process of research
- Propose a research topic independently

Course Content:

Unit I: Introduction to Media Research 12 Hours

Introduction to research concepts- Definition, types & need for research; 'Scientific' research and its basic principles empiricism, verifiability, generalization; Fundamental vs. Applied Research; Quantitative vs. Qualitative data; Role of research in the media.

Unit II: Elements of Research 12 Hours

Review of Literature; Research Approaches or designs: Experiment; Survey, Content Analysis; Case Study; Data collection techniques: Questionnaire, Interview, Schedule; Sampling techniques.

Unit III: Research Presentation 12 Hours

Data processing, Analysis, presentation and interpretation of data; Use of graphics in data presentation; Research writing - Research proposal; Chapterization of thesis: Components and style; Preparation of Bibliography, Index'

Unit IV: Research in media audiences and the 'effects' debate 12 Hours

Magic bullet to limited effects; Users and Gratifications model; Cultivation analysis; Audience reception.

Practical Component

- Research Proposal/ Synopsis Presentation
- Bibliography Chapter

References Books

1. Berger J. 2000 *Media and Communication Research Methods: An Introduction To Qualitative And Quantitative Approaches*, California Sage Publication.
2. Wimmer, Roger D. and Dominick, Joseph R. 2000. *Mass Media Research: An Introduction*, Singapore Wadsworth Publishing
3. Kothari, C.R , 1990 *Research Methodology: Methods and Techniques*, New age International Ltd. Publishers.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE403	**American Literature**	HC	4	0	0	4	4

Course Desription:

American literature is closely steeped in history and this course therefore is specifically designed to acquaint the students with literary narratives or texts framed in history for a wider understanding of the domain of American Literature at large.

Course Objectives:

- To help the students understand the relationship between history and literature.
- To help the learners to become acquainted the development of American literature and its rich variations.

Course Outcomes:

On completion of the course, the students will be able to:

- Demonstrate the development of the American literature.
- Identify the major American poets and their works.
- Outline the various issues presented in American prose.
- Demonstrate complete familiarity with the features of the American novel and drama.
- Make use of American film texts to get a good grasp of issues related to America.

Course Content:

Unit-I: Poetry **12 Hours**

1. Walt Whitman – O Captain! My Captain!
2. Emily Dickinson – The Chariot
3. Robert Frost – Birches
4. Langston Hughes – Let America Be America Again
5. Sylvia Plath – Disquieting Muses
6. Allen Ginsberg – Supermarket in California

Unit-II: Prose **12 Hours**

1. Nathaniel Hawthorne – Rappaccini's Daughter
2. Philip Roth – Defender of the Faith
3. Frederick Douglass – Extract from *Narrative of the Life of Frederick Douglass, an American Slave*
4. Chief Seattle – *Speech*

Unit-III: Drama / Fiction **12 Hours**

1. Tennessee Williams – *The Glass Menagerie*
2. Scott Fitzerald – *The Great Gatsby*

Unit-IV: American Film Texts **12 Hours**

1. Margaret Mitchell – *Gone With the Wind*
2. Henry James – *Golden Bowl*

Reference Books:

1. Whitman, Walt. *The Complete Works of Walt Whitman*. Asia Pacific, 2013.
2. Collins, Billy. *The Selected Poems of Emily Dickinson*. Modern Library, 2000.
3. Frost, Robert. *The Collected Poems*. Vintage Classics, 2013.
4. Rampersad, Arnold. *The Collected Poems of Langston Hughes*. Vintage, 1995.
5. Plath, Sylvia. *Sylvia Plath Selected Poems*. Faber, 2003.
6. Ginsberg, Allen. *Selected Poems 1947-1995*. Penguin, 2001.
7. Hawthorne, Nathaniel. *The Complete Works of Nathaniel Hawthorne*. Asia Pacific, 2017 (Kindle edition)
8. Jacobs, Harriet. *Incidents in the Life of a Slave Girl*. Digireads, 2001.
9. Blaisdell, Bob.*Great Speeches by Native Americans*. Dover, 2000.
10. Fitzgerald, F. Scott. *The Great Gatsby*. Collins, 2010.
11. Williams, Tennesse. *A Streetcar Named Desire*. Penguin, 2009.
12. Mitchell, Margaret. *Gone with the Wind*. Maple, 2015.
13. James, Henry. *The Golden Bowl*. Wordsworth Editions, 2000.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.

17JE404	**Developmental Psychology-II**	HC	2	0	2	4	5

Course Description:

This course is a study of human growth and development. Emphasis is on major theories and perspectives as they relate to the physical, cognitive, and psychosocial aspects of development from conception to death. Upon completion, students should be able to demonstrate knowledge of development across the life span. Course work includes projects which emphasize research. This course has been approved to satisfy the Comprehensive Articulation Agreement for the general education core requirement in social/behavioral sciences.

Course Objectives:

- Explain the importance of studying life-span development.
- Describe the history of interest in the life-span perspective and indicate how contemporary concerns have arisen from previous views.
- Discuss the nature of development as a pattern of movement or change occurring throughout the life span.
- Define and distinguish between biological processes, cognitive processes, and socio-emotional processes.
- Understand the major developmental periods from conception to death.
- Understand, compare, and contrast the key development theories
- Define and distinguish between theory, hypotheses, and the scientific method, and understand the different research measures used by developmental psychologists.
- Understand the standard ethics of developmental research.

Course Outcomes:

On completion of the course, students will be able to:

- Identify the major issues, tasks and milestones of human development, such as physical, cognitive, social and emotional development throughout the lifespan.
- Evaluate core concepts, strengths, and weaknesses of the major theories of lifespan development.
- Evaluate how ethnicity, culture, class, and gender influence lifespan development.
- Explain the impact of biological/genetic influences on physical growth, cognition and behavior.
- Assess how current research supports and critiques the major theories of development.
- Demonstrate the developmental aspects such as physical development, cognitive development, psychosocial development and emotional development in each stage of human life span.

Course Content:

Unit-I: Introduction And Prenatal Development **12 Hours**

a) Concept of human development-Introduction, stages of life span development.
b) Aspects of human development- Physical, social, cognitive, moral.
c) Factors influencing human development-Ecological factors, hereditary factors.
d) Overview of theories of human development- Erickson, Piaget, Kohlberg.
e) **Conceiving a new life**-Fertilization; Multiple Births
f) **Mechanisms of Heredity**- Genetic Code, Sex Determination, Patterns of Genetic Transmission -Dominant and Recessive Inheritance.
g) Chromosomal and Gene linked abnormalities. – Chromosomal Abnormality-Down syndrome; **Sex-linked chromosomal abnormalities** - Kleinfelters, fragile X, Turner's, XYY; **Gene linked abnormalities** - PKU, Sickle Cell Anaemia.
h) **Stages of prenatal development**.
i) Prenatal Assessment- Amniocentesis, chorionic villus sampling, embryoscopy, pre-implantation diagnosis, maternal blood test, umbilical cord blood sampling, ultrasound.
j) Birth Process- Stages of Child Birth .

Unit-II: Infancy to Childhood **12 Hours**

a) Newborn appearance, reflexes, assessment and states
b) Physical and motor development, cognitive and language development, psychosocial development: Emotions.

Unit-III: Puberty And Adolescence **12 Hours**

a) Puberty: Meaning, biological changes: Sexual maturation, growth spurt, primary and secondary sexual characteristics; responses to physical change; Development of identity;
b) Adolescent relationships: Family, Peers.

Unit-IV: Adulthood **12 Hours**

a) Physical development
b) Foundations of intimate relationships: friendship, love, and sexuality; Marriage: Marital adjustment and conditions influencing it. Parenthood: adjustment to parenthood.
c) Occupational adjustment: Stable and unstable patterns, preparation for retirement, work retirement and leisure in late adulthood.
d) Psychosocial changes: Coping with Mid-life crisis, Primary and secondary ageing.
e) Psychosocial aspects: lifestyle and social issues: Personal relationships: Relationship with adult children, great-grandparenthood.
f) Stages and patterns of grieving.

Practicals-IV

1. Self-Concept Rating Scale (R.K.Saraswat)
2. Happiness Inventory

3. Concept Formation for height and size
4. Two Point Threshold
5. Size and weight Illusion

Reference Books:

a. Diane E Papalia (1998), Human Development 7th International Edition, Mc Graw Hill Publications
b. Lois Hoffman (1988), Developmental Psychology Today 5th Edition, Mc Graw Hill Inc.
c. Elizabeth B Hurlock(1987), Developmental Psychology-a life-span approach 5 th Edition, Tata Mc Graw Hill publication
d. Laura E Berk (1999), Child Development Prentice Hall of India
e. Hetherngton & Parke (1999), Child Psychology. 5 th International Edition, Mc Graw, Hill
f. John W. Santrock (1999) Life Span Development, 7 th Ed. Mc Graw Hill Publication

FIFTH SEMESTER

Course Code	COURSE TITLE	Course Type	L	T	P	C	Hrs./ Wk.
17JE501	**Media Laws And Ethics -V**	HC	2	0	2	4	4

Course Description:

The purpose of this course is to provide students with a model by which to analyze, understand, and act upon the law and ethical considerations which journalists face. The course will consist of the writings of the Supreme Court, the Ethical rules of the Society of Professional Journalists, and actual events to build an analytical model. There is no profession more important to a democracy than journalism -when vigilant and diligent and resolute. In order to perform that role, the students are required to understand both the law and the ethics that govern it.

Course Objectives:

- To provide students with knowledge on the laws and ethics in journalism
- To equip the students with legal understanding of legal issues impacting them on the field.
- To make students aware of the legal limits when reporting on sensitive and controversial issue of the day

Course Outcomes:

At the conclusion of this course, students will be able to:

- List best contemporary ethical and professional journalism practices
- Define basic legal terminology.
- Explain the workings of the Indian civil and criminal justice system.

- Define the limits of legal rights.
- Assess when to seek legal counsel when needed and explain current legal issues impacting journalists
- Appraise how to avoid claims of defamation and invasion of privacy

Course Content:

Unit I: Indian Constitution **12 Hours**

Preamble; Directive principles; Fundamental Rights and duties; Article 19-1(a) and (b) - with reference to Freedom of the Press- reasonable Restrictions.

Unit II: Media Laws **12 Hours**

Press and registration of books Act; Working Journalist Act- Defamation; Civil and criminal defamation; Contempt of court; Right to Information Act; Copy right Act ; Intellectual property rights; Cyber Laws; cable network Resolution; Film Censorship; Cinematograph Act 1952; Prasar Bharathi Act.

Unit III: Issues in Media **12 Hours**

Information Society; ICT revolution-Knowledge society; NWICO; Media and Globalization; Implications.

UNIT-IV: Ethics in Media **12 Hours**

Control; Press commission's (I&II) recommendations
Press council- code of conduct for journalists
Broadcasting Code-Right to privacy-INS-KMA-AINEC

Practical Component

- Case study Presentation
- RTI
- News Analysis of Court and Parliamentary Proceedings
- Visit to High Court/ Vidhana Soudha

Reference Books:

1. Singh Sanjay Kumar. 2013.*Press Laws and ethics of Journalism*. Anmol Publication Pvt Ltd.
2. Malar and M neela .2012. *Media laws and ethics*. New Delhi: PHI learning private limited.
3. Sharma Kumar Ajay. 2012. *Journalism laws*. New Delhi: Random Publications.
4. Singh Yatindara Justice .2005. *Cyber Laws*.Delhi Universal Law Publishing.
5. Basu DD. 2002. *Law of the Press*. New Delhi: Prentice Hall.
6. Seib Philip & Fitzpatrick Kathy.2000. *Journalism Ethics*. New York : Harcourt Brace College Publishers.

7. T Mecluskey Matha.1997. *Feminism, Media and The Law*. New York:Focus Press.
8. K SVenkateshwaran .1993. *Mass Media Laws and Regulations in India*. Singapore : AMIC.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE512	**Advertizing and Corporate Communication-VI**	SC	2	0	2	4	4

Course Description:

The course Advertising and Corporate Communication will make the students aware of the advertising environment in the 21st Century, agency and client relationships, consumer behavior, ethics, and the role of research, creative appeals, and media selection in advertising effectiveness. Within corporate communications classes, students focus on the management, strategic planning, and implementation of marketing, communication, and public relations techniques all to resolve corporate dilemmas. Corporate communications course focuses on researching problems, setting objectives, identifying audiences, designing messages, choosing communication channels, and evaluating results for all types of organizations. Ethical decision making, on-line communication, and career opportunities are also analyzed via case studies in the field. The course will be a combination of informal lecture and small-group discussion, case analysis, and guest lecture.

Course Objectives:

- To introduce the students to the Concepts and Principles of Advertising, Ad Agency Management and Brand Management
- To take the students through the roles and scopes of PR in management, its various tools and the emerging importance of the discipline in varying areas.
- To look at the evolution of Corporate Communication and its expanded role in organizational and marketing communication

Course Outcomes:

At the conclusion of this course, students will be able to:

- Ouline the process of producing advertisements
- Construct and analyze audience research, media research, and environmental scanning
- Devise public relation strategy for the organization image and well-being
- Formulate corporate communication strategy for crisis management, brand management, etc.

Course Content:

Unit-I : Introduction to Advertising **12 Hours**

Advertising- Definition, Nature and scope

Origin and development of advertising

Social and Economic Effects of Advertising
Ad Agency- structure and Function.

Unit-II : **Elements in Advertising** **12 Hours**

Mediums of advertising: Print, Radio and television
New trends in advertisement; Designing advertisement: Copy writing, elements of ad copy, layout
Ethics in advertising
Types of advertising
Advertising appeals
Campaigns- Media planning strategy, media mix, Media selection, Ad budgeting.

Unit-III: **Introduction to Public Relations** **12 Hours**

Public Relations- Meaning &Definition, nature, scope; Functions
Origin and development of public relations in India
Public opinion; Publicity; Propaganda
Role and responsibility of a public relation practitioner.

Unit-IV: Aspects of Public Relations **12 Hours**

Organizing a press conference
Media relations: Press releases, house journals – Internal and Externals, Pamphlets and brochures, Presentation skills
Social Media in PR: corporate blogs and social networking
Ethical issues in PR- Employee relations, share holder relations, distributor-dealer relations, community relations, consumer relations. lobbying and fundraising
Professional organizations in PR.

Practical Component

- Poster making (Social message)
- Brochure
- Display Ad (Product and Service)
- Preparing Press Release

References Books:

1. J V Vilanilam .2011.*Public Relations in India*, Sage Publications.
2. Choonawala S A and Sethia K C (Edt).2005. *Foundations of Advertising theory & Practice, Bangalore*: Himalaya Publishing.
3. Wells and Morlaty Burfert (Edt). 2003. *Advertising: Principle & Practice*.New Delhi:Prentice Hall.
4. Chandrakandan . 2002. *Public Relations,* Authors press.
5. Percy LarR ry.2002. *Strategic Advertisement Management*, Europe Prentice Hall ISBN.

6. R Staffer Marla (Edt).2001. *Advertising Promotion and New Media*, USA :Times Mirror Co.
7. Wells William.2001. *Advertising, Principles and Practice*, London: Prion Books Ltd.
8. Ahuja & chabra. 2001. *Public Relations*. New Delhi : Surjit Publications.
9. F Arens Williams.2000. *Contemporary Advertisement*,USA: Times Mirror Education Group.
10. Singh Bir. (Edt). 2000. *Advertising Management* .New Delhi: Anmol Publications.
11. Percy Larry (Edt). 2000. *Strategic advertisement Management*. New Delhi: Suraj Publications.
12. Pandey,Meena. 1989. *Foundation of Advertising Theory and Practice*.Bombay: Himalaya Publishing house.
13. M Scott, Cutlip.1985 *Effective Public relations*. Prentice Hall.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE522	**Fundamentals of Photography-VI**	SC	2	0	2	4	4

Course Description:

This course will introduce students to the basic principles and techniques of b/w and color digital photography. Hands-on class demonstration and training will be ranging from the technical to the artistic, employing both straightforward and creative camera and computer procedures.

The teaching style will incorporate several formats including seminar-type presentations, hands-on practice, group discussions, critiques, and independent research.

Course Objectives:

- To make the students concentrate on building the fundamental skills needed to produce images for publication in today's media.
- To ensure that students successfully acquire a basic knowledge of how to operate their cameras
- To equip students with skills that allow the use of technology to the advantage as visual storytellers.

Course Outcomes:

At the conclusion of this course, students will be able to:

- Demonstrate a competent mastery of using a digital camera to produce images that are ready for publication in professional media.
- Create compelling images that communicate the intended message with accurate captions which are publishable in professional publications.
- Plan to gather and use audio to enhance the communicative value of a visual package.

Course Content:

Unit-I : Introduction To Photography **12 Hours**

Photography, its role & importance and history
Types of camera- TLR, SLR, Polaroid, Underwater Camera & Digital Camera
Parts & functions of camera- Aperture, Shutter speed, ISO, Focal No. & Focal Length, Depth of Field, Shallow Depth of Field;
Camera accessories: Tripod, Monopod, Filters, Lens hood and Rigs

Unit-II: Aspects of Photography **12 Hours**

Lens- Definition, Concept & Characteristics of lens
Types of lens- wide angle, normal & Tele; Special lens- zoom, fish eye & macro Lens;
Filter- definition & concept; Characteristics and types of filters
Planning a shoot, studio, location, set props and casting

Unit-III: Principles of Photography **12 Hours**

Lighting: Sources of light: Natural & Artificial
Elements of composition- Rule of Third, Rule of Thumb, Diagonal and S-shaped compositions, Repetition and Rhythm, Moving towards the centre
Cropping and Editing

Unit-IV: Issues Related to Photojournalism **12 Hours**

Various types of photography: Portrait, Wildlife, Nature, Human Interest, Sports, Advertising, Tabletop and Night photography;
Text vs. Photograph; Essentials of a press photograph
Qualities of a good photojournalist
Visual story telling - Photo-features, Photo – essays
Writing captions
Different problems related to Photography

Practical Component

- Shooting exercise in artificial lights and natural light
- Photo feature on a specific topic by using self-clicked photographs with Digital Camera.
- Photographs should be of postcard size. A photo feature must comprise of 10 – 12 photographs.
- Each student shall be required to take photographs in the following categories:
  1) Night Photography
  2) Architecture

3) Portrait
4) Landscape
5) Fashion
Create and design a photo album with text, captions; Individual assignment; minimum 12 prints in A4 pages in multi color, spiral binding

Reference Books:

1. London, Barbara and Stone, Jim. 2012, *A Short Course in Digital Photography*. Pearson
2. Ang, Tom. 2008, *Digital Photography Masterclass*, DK Publishing

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE503	**English Literature-V Literary Criticism**	HC	4	0	0	4	4

Course Desription:
This course has been designed to offer the students a comprehensive knowledge of western literary criticism with an emphasis on select prominent thinkers and their significant ideas. The course has also been developed in order to groom the students towards a profound critical approach towards literature.

Course Objectives:

- To acquaint the students with the basic ideas of literary criticism.
- To introduce the students to the development of literary criticism.
- To expose the students to the diversity of literary criticism.

Course Outcomes:
On completion of the course, the students will be able to:

- Develop an initial association with literary criticism of different era.
- Explain the major characteristics of Greek Literary Criticism.
- Demonstrate a good understanding of Elizabethan, Neo-Classical and Romantic Criticism.
- Outline the major features of Victorian, Modern and Postmodern Criticism.

Course Content:

Unit-I: Introduction **12 Hours**
Function of literature and literary criticism
3. Brief history of literary criticism

Unit-II: Introduction to Greek Literary Criticism **12 Hours**

1. Introduction to Greek Literary Criticism
2. Plato: *The Republic* (Extract)
3. Aristotle: *Poetics* (Extract)

Unit-III: Elizabethan, Neo-Classical and Romantic Criticism **12 Hours**

1. Introduction to Elizabethan, Neo-Classical and Romantic Criticism
2. Dryden: *Essay of Dramatic Poesy* (Extract)
3. William Wordsworth & Samuel T. Coleridge: Preface to *Lyrical Ballads* (Extract)

Unit: IV Victorian, Modern and Postmodern Criticism

1. Introduction to Victorian, Modern and Postmodern Criticism
2. Matthew Arnold: The *Study of Poetry* (Extract)
3. T.S. Eliot: Tradition and Individual Talent (Extract)
4. Lawrence E. Cahoone: What Postmodernism Means

Reference Books:

1. Habib, M.A.R. *Literary Criticism from Plato to the Present: An Introduction*. Wiley India, 2012.
2. Plato, *The Republic*. Maple, 2013.
3. Aristotle, *Poetics*. Penguin, 1996.
4. Sen, S. *John Dryden: An Essay of Dramatic Poesy*. Unique Publishers, 2009.
5. Wordsworth, William & S.T. Coleridge. *Lyrical Ballads*. Penguin, 2006.
6. Arnold, Mathew. *Culture and Anarchy and Other Selected Prose*. Penguin, 2015.
7. Eliot, T.S. *Sacred Wood:Essays on Poetry and Criticism*. Nabu Press, 2013.
8. Cahoone, Lawrence E. *From Modernism to Postmodernism*. Wiley-Blackwell, 1995.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE504	**English Literature-VI Indian Writings in English – I**	SC	4	0	2	4	4

Course Desription:

This course has been designed to introduce the students to the works of Indian Writings in English. In the modern world, it is extremely important to know and appreciate one's roots and therefore this

course shall help the students to frame their own ideologies and identities and at the same time make them aware of the richness of Indian literature and culture.

Course Objectives:

- To introduce the students to Indian Writing in English, particularly to writings in translations.
- To introduce the students to literary and political issues that Indian writing in English has undergone since the beginning of its nascence.

Course Outcomes:

On completion of the course the students will be able to:

- Explain the various issues dealt by classical and modern poets of Indian Writings in English.
- Analyze the major features in the fictional narratives of Indian Writings in English.
- Demonstrate familiarity with concerns specific to India as presented in non-fictional works by Indians writing in English.

Course Content:

Unit-I: Poetry **12 Hours**

1. Kalidasa – Canto I "Summer" (from *Ritusamhara*)
2. Kabir – If God be within the mosque…
3. Mira Bai – Your Slander is Sweet
4. Ramprasad Sen – O Longing Mind
5. Sumitra Nandan Pant – Fruits of the Earth
6. Fiaz Ahmed Fiaz – The Colour of the Moment
7. Kuvempu – Kalki
8. Sitakant Mahapatra – Father

Unit-II: Short Fiction **12 Hours**

1. Munshi Premchand – The Shroud
2. Saadat Hasan Manto – Thanda Gosht
3. Lalithambika Antarjanam – Revenge Herself

Unit-III: Essays **12 Hours**

1. Rabindranath Tagore – Religion of the Forest
2. A.K. Ramanujan – Is There an Indian Way of Thinking?

Unit-IV: Drama/ Novel **12 Hours**

1. Girish Karnad – *Hayavadana*

2. R.K. Narayan – *The Guide*

Reference Books:

1. Kale, MR. *The Ritusamhara*. Bharatiya Kala Prakashan, 2007.
2. Dharwadker, Vinay. *Kabir*. Penguin, 2003.
3. Bly, Robert. *Mirabai: Ecstatic Poems*. Aleph Book, 2017.
4. Sen, Ramprasad. *Grace and Mercy in her Wild Hair: Selected Poems to the Mother Goddess*. Hohm Press, 1999.
5. Kiernan, V.G. *Poems by Faiz Ahmed Faiz*. Oxford, 2000.
6. George, KM. *Modern Indian Anthology: Surveys and Poems*.SahityaAkademi, 1992.
7. Manto, Saadat Hasan & Aatish Taseer. *Manto: Selected Short Stories*. RHI, 2012.
8. Narasimhachar, Sudha. *Selected Stories of MunshiPremchand*. Unicorn Books, 2016.
9. Holmstorm, Lakshmi. *The Inner Courtyard: Stories by Indian Women*. Rupa, 1991.
10. Tagore, Rabindranath. *Rabindranath Tagore Omnibus*. Rupa, 2003.
11. Ramanujan, A.K. *The Collected Essays of A.K. Ramanujan*. Oxford University Press, 1999.
12. Narayan, R.K. *The Guide*. Indian Thought Publications, 2007.
13. Karnad, Girish. *Hayavadana*. Oxford, 1997.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE504	**English Literature-VI European & Non-European Literature – I**	SC	2	0	2	4	4

Course Desription:

The widening of the domain of English literature all across the globe has made it extremely important to acquaint the students of English literature to the vast oeuvre of non-canonical literature. This course in particular is designed to introduce the students to the large bodies of European and Non-European literature.

Course Objectives:

- To acquaint the students with literature from all over the world and initiate them to the basic concepts and ideas of non-canonical literature.
- To expose the students to a large body of literature in order to develop in them a greater understanding of multiple socio-political histories and culture.

Course Outcomes:

On completion of the course the students will be able to:

- Demonstrate a good understanding of various issues presented in poetry from all over the world.

- Develop an initial association with the fictional works of literary stalwarts from various nations.
- Outline the characteristic features of Greek drama.
- Summarize the history of Hitler's regime.

Course Content:

Unit - I: Poetry **12 Hours**

1. Homer – from *The Iliad*
2. Dante – from *The Inferno*
3. Federico Garcia Lorca – Absent Soul (from *Lament for Ignacio Sanchez Mejias*)
4. Bertolt Brecht – To Those Born Later
5. Anna Akhmatova – Extract from *The Requiem*
6. Czeslaw Milosz – In Warsaw

Unit-II: Short Fiction **12 Hours**

1. Leo Tolstoy – God Sees the Truth, But Waits
2. Franz Kafka – A Hunger Artist
3. Jean-Paul Sartre – The Wall

Unit - III: Essays **12 Hours**

1. Simon Goldhill – Introduction from *Greek Tragedy*
2. William L Shirer - *The Rise and Fall of the Third Reich: A History of Nazi Germany* (Extract)

Unit-IV: Drama/ Novel **12 Hours**

1. Sophocles – *Oedipus Rex*
2. Anton Chekov – *The Cherry Orchard*

Reference Books:

1. Homer. *The Iliad.* Penguin,2003.
2. Alighieri, Dante. *Inferno.* Collins, 2011.
3. Lorca, Frederico Garcia. *Collected Poems.* Penguin, 2001.
4. Akhmatova, Anna. *Akhmatova: Poems.* Everyman's Library, 2006.
5. Brecht, Bertolt. *Selected Poems.* Mariner Books, 1947.
6. Milosz ,Czeslaw. *New and Collected Poems: 1931-2001*. Penguin, 2006.
7. Tolstoy, Leo. *God Sees the Truth, But Waits.* Creative Classics, 1986.
8. Kafka, Franz. *A Hunger Artist.* Twisted Spoon Press, 1996.
9. Sartre, Jean Paul. *The Wall.* Hal Leonard Corp, 1995.
10. Aeschylus, Euripides and Sophocles. *Greek Tragedy*. Penguin, 2004.
11. Shirer, William L. *The Rise and Fall of the Third Reich: A History of Nazi Germany*. RHUK, 1991.
12. Sophocles. *The Three Theban Plays.* Penguin, 1984.
13. Chekhov, Anton. *Plays.* Penguin, 2002.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE505	**Industrial Psychology-1**	HC	2	0	2	4	4

Course Description:

Industrial psychology combines the principles of psychology with a methodical investigation of various work settings. Often referred to as industrial-organizational psychology, this discipline analyzes numerous aspects of the working world and the attitudes of individuals toward their respective careers. Industrial psychology concerns itself with the application of psychological concepts to the work environment. Professionals who hold degrees in the discipline often perform consulting work for companies.

Course Objectives:

1. Students will acquire knowledge required for the practice of industrial-organizational psychology and human resource management.
2. Students will develop skills required to engage in the practice of industrial-organizational psychology and human resource management.
3. Students will acquire methodological and analytic knowledge and skills that enable them to function as scientist-practitioners in industrial-organizational psychology and human resource management.

Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Demonstrate a solid fundamental knowledge of psychology as a discipline. This will include both knowledge of the history of the field, but also of the current facets, theoretical perspectives, and the divisions within the broad field of Psychology.
2. Be proficient scientists. This includes being knowledgeable about forming hypotheses, collecting, analyzing and interpreting the data necessary to test the hypotheses, and thinking critically about the obtained results. This will necessarily include both classroom didactic training and conducting an empirically based thesis.
3. Be proficient in the domains that comprise the core of I-O Psychology, which include: 1) ethical, legal, and professional contexts, 2) measurement of individual dfferences, 3) criterion theory and development, 4) job and task analysis, 5) employee selection, 6) performance appraisal, 7) training and development, 8) work motivation, and 9) attitude theories.
4. Be knowledgeable in the practice of I-O psychology by applying the concepts in the field of I-O psychology to the functioning of organizations.

Course Content:

Unit-I: Introduction To Organizational Psychology 12 Hours

a. Definition, Goals, Forces and Fundamental concepts -Nature of people and nature of organization. Areas of Industrial psychology.
b. Two classical studies-A).Time and motion study -Nature and characteristics, Use of Therbligs. Principles, psychological implications and shortcomings
c. Hawthorne studies –Nature, Implications and criticisms. Importance of Time and Motion studies and Hawthorne studies.

Unit-II: Job Analysis And Selection 12 Hours

a. Job Analysis: Definition and methods – Questionnaire method, Checklist method, Individual interview method, Observation, Group interview method, Technical conference method, Diary method, Work participation method and Critical incident method.
b. Selection: Application blanks.Psychological tests used in selection – intelligence tests, personality tests, interest tests and aptitude tests.(mention two in each area).
c. Interview – guided interview, unguided interview, stress interview and group interview.

Unit-III: Motivation and Reward Systems 12 Hours

a. Motivation- Goal setting- elements, Content Theories of Motivation – Herzberg's-Motivator-Hygiene (Two factors) Theory, Alderfer's- E-R-G Model.
b. Reward system- Financial and Non-financial incentives.
c. Economic Incentive Systems: Purposes & Types- Incentives Linking Pay with Performance, Wage Incentives, Profit Sharing, Gain Sharing, And Skill-Based Pay.

Unit-IV: Training and Managing Communications 12 Hours

a. Training: Nature of Training; Goals of organizational training. Methods /approaches to training.
b. Communication: Communication Fundamentals, Two-way Communication Process-
Potential Problems; Communication Barriers – Impact of Barriers on Communication Process. Types of Communication.

Practicals -V: Industrial Psychology

1. David's Battery of Differential Aptitudes-I
2. David's Battery of Differential Aptitudes-II
3. Comprehensive Interest Schedule
4. Tweezer Dexterity Test.
5. Revan's Progressive Matrices.

Reference Books:

1. Schultz D.P. And Schultz E.S –Psychology & Work Today Eighth Edition, Pearson Education,Inc.And Dorling Kinderssley Publishing Inc.
2. John W Newstrom- Organizationalbehaviour-Human Behaviour At Work. Twelfth Edition Tata Mcgraw-Hill Publishing Company Limited.New Delhi.
3. Girishbala Mohanty-Industrial Psychology and Organisational Behaviour, Kalyani Publishers, Ludhiana

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE516	**Abnormal Psychology-1**	SC	2	0	2	4	4

Course Description:

This course provides an examination of the various psychological disorders as well as theoretical, clinical, and experimental perspectives of the study of psychopathology. Emphasis is on terminology, classification, etiology, assessment, and treatment of the major disorders. Upon completion, students should be able to distinguish between normal and abnormal behavior patterns as well as demonstrate knowledge of etiology, symptoms, and therapeutic techniques. Course work includes projects. *This course has been approved to satisfy the Comprehensive Articulation Agreement for the general education core requirement in social/behavioral sciences.*

Course Objectives:

1. Students will learn the categories and descriptions of the leading mental disorders.
2. Students will learn the different theoretical models explaining the causes of the disorders, and the empirical evidence linking biological, cognitive, emotional, behavioral, and social/cultural factors with each disorder.
3. Students will learn how mental disorders are assessed, and the leading evidence-based methods of treatment.
4. Students will learn how to use critical reasoning skills to apply theoretical concepts and empirical evidence to the understanding of mental health issues, including hypothetical clinical cases.

Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Compare and contrast biological, psychological, family, and social views of the causes and treatment of abnormal behavior.

2. Identify and compare major scientific methods for gathering and analyzing information to describe abnormal behavior.
3. Identify the difference between organic and functional disorders.
4. List and/or recognize the characteristics of specific anxiety, somatoform, mood, eating, sleep, sexual-identity, substance abuse, personality, schizophrenic and cognitive disorders.
5. Recognize ethical therapeutic practices according to the American Psychological Association Guidelines.

Course Content:

Unit-I: Introduction to Psychopathology 12 Hours

a. Modern concepts of abnormality,
b. Issues of diagnosis: The medical model, Etiology of mental health problems: Genetic models, Biological models, Psychological models, Socio-cultural models; Diathesis-stress model.

Unit-II: The Psychological Perspectives on Abnormal Behaviour 12 Hours

a. The psychoanalytic approach: Freud, Freud's contemporaries and descendants, the practice of psychoanalysis.
b. Behavioural approaches: Behaviour therapy.
c. Cognitive approaches: Cognitive behavioural therapy.
d. Humanistic approaches: Humanistic therapy.

Unit-III: Diagnosis 12 Hours

a. Cornerstones of Diagnosis: Reliability, Validity.
b. Classification and Diagnosis: The Diagnostic System of the American Psychiatric Association (DSM-V), Specific Criticisms of the DSM.

Unit-IV: Psychological Assessment 12 Hours

a. Clinical Interviews, Assessment of Stress, Personality Tests, Intelligence Tests, Behavioral and Cognitive Assessment.
b. Neurobiological Assessment: Neuropsychological Assessment, Psycho physiological Assessment.
c. Research Methods in the Study of Psychopathology: Science and Scientific Methods; Approaches to Research on Psychopathology.

Reference Books:

1. Alloy, L.B., Riskind, JH., and Manos,M.J. (2006). Abnormal Psychology – Current Perspectives. 9th Edition. New Delhi: Tata McGraw- Hill Edition.
2. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed., text revision). Washington, DC: Author.

3. Barlow,D.H. and Durand,M.V. (2000). Abnormal Psychology. 2nd Edition. New Delhi: Thomson Publication.
4. Bootzin,R.B.,Acocella,J.R. and Alloy,L.B. (1993). Abnormal Psychology–Current perspectives. 6th Edition, International Edition,Tata Graw –Hill Inc., USA.
5. Carson, R.C., Butcher, J.N and Mineka ,S.(2004). Abnormal psychology. 13th Edition. New Delhi: Pearson Education.
6. Davidson and Neal (1996). Abnormal psychology. Revised 6th Edition, John Wiley Sons World Health Organization. (2008). ICD-10: International statistical classification of diseases and related health problems (10th Rev. ed.). New York, NY: Author.
7. Sue,D.,Sue,,D and Sue.S. (1990). Understanding Abnormal Behaviour. 3rd Edition, Houghton Miffin Co.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE526	**Health Psychology-1**	SC	2	0	2	4	4

Course Description:

This is an advanced course in psychology designed to give a broad overview of the field of health psychology. Health psychology is a relatively young, diverse, and multidisciplinary field that examines the mind-body connection and many factors that influence the individual's well-being. In this course, students will explore how biological, psychological and social factors are connected and how they may influence health consequences. Following this bio-psychosocial approach, potential biological, psycho physiological, and behavioral pathways to health and disease will be explored. By the end of the course, I hope that students would gain fundamental knowledge of the field of health psychology, develop skills for critically evaluating health psychology research, and understand how health psychology may be applied to promote their own well-being.

COURSE OBJECTIVES

Students are expected to develop an understanding of health psychology and gain skills in the following:

1. To critically examine the interactions between psychological, behavioral, social, and biological factors on health.
2. To articulate the basic premises and theories of health psychology.
3. To describe and appraise intervention approaches for various physical illnesses in relation to psychology.
4. To discuss the role of psychologists involved in health settings.

COURSE OUTCOMES :

Upon successful completion of this course, students will be able to:

1. Elucidate the biological, cognitive and socio-cultural factors influence health-related behaviour.
2. Evaluate strategies for coping with stress - for example, stress inoculation therapy, hardiness training, yoga and meditation.
3. Understand factors related to the development of substance abuse or addictive behaviour.
4. Examine prevention strategies and treatments for substance abuse and addictive behaviour - for example, family therapy, drugs and bio-psychosocial treatments.
5. Analyze factors related to overeating and the development of obesity.
6. Identify prevention strategies and treatments for overeating and obesity.

Course Content:

Unit-I: Introduction **12 Hours**

a) Definition of Healthy Psychology, History of Health Psychology; The Bio-Medical model
b) Illness cognition; the meaning of being healthy; Levinthal's self-regulatory model of illness cognition till stage 3.
c) Doctor–patient communication and the role of health Professionals' health beliefs.

Unit-II: Stress and Illness **12 Hours**

a) Stress: What is stress? Theories of Stress – (Cannon, Selye, Lazarus); Subjective correlates of stress.
b) Coping with stress; nature of coping; coping strategies; measuring coping; Social support.
c) The impact of chronic stress, which factors moderate the stress–illness link? Personality and illness. Control and social support in stress and illness.

Unit-III: Addictive Behaviour – A Perspective **12 Hours**

a) Addiction.
b) Factors involved in learning addictive behaviour; Stages of substance abuse;
c) Interventions to promote cessation.

Unit-IV: Modification and Enhancement of Health Behaviour **12 Hours**

a) Modification – Changing Health Habits; Cognitive-Behavioural Approaches to Health Behaviour Changes.
b) Health Enhancing Behaviour – Exercise, Maintaining a Healthy Diet, Food Habits, Weight Control.

Practicals-VI

Assessment of Personality

1. Eysenk's personality questionnaire
2. Bell's adjustment inventory

3. Type A and Type B behavioural pattern
4. Quality of Life
5. Big-5 personality factors

References Books:

1. Jane Ogden (2010) Health Psychology – a text book, 4th edition, Tata McGraw Hill Education Private Limited, New Delhi.
2. Shelley E. Taylor (2006) Health Psychology – 6th Edition, Tata McGraw Hill Education Private Limited, New Delhi.
3. Steve R. Baumgardner & Marie K. Crothers (2009) Positive Psychology, Dorling Kindersley (India) Pvt. Ltd., licensees of Pearson Education in South Asia.
4. M. Robin Dimatteo & Leslie R. Martin (2002) Health Psychology –, Dorling Kindersley (India) Pvt. Ltd, licensees of Pearson Education in South Asia.
5. Alan Carr- Positive Psychology, Dorling Kindersley (India) Pvt. Ltd, licensees of Pearson Education in South Asia**.**

SIXTH SEMESTER

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE601	**Media Management-VII**	HC	2	0	2	4	4

Course Description:

This course is designed to provide students with detailed insight into the structures, management, processes, economics of and controversies surrounding the management of media industries. The course will be valuable as a part of career preparation for the students interested in working in the administration and management of media industries and in sectors like advertising, media sales and public relations.

Course Objectives:

- To enable in the students an understanding of the organizational and economic structures of print and electronic media industries
- To familiarize the students with new technologies and their impact on the media landscape
- To acquaint the students with issues affecting the management of media enterprises

Course Outcomes:

By the end of the course Students will be able to-

- Analyze individual media business foundations and understand the economic drivers of the media economy
- Perceive the evolution of media in the last 25 years and on key current trends
- Develop an integrated marketing plan using a wide variety of media components that will take a comprehensive approach to a marketing challenge
- Develop hands-on experience as content marketers using journalistic and digital techniques

Course Content:

Unit – I: Introduction To Media Management **12 Hours**

Principles of management - Definitions scope and functions
Management process
Essentials of management
FDI influences on media

Unit – II: Ownership Patterns in Media **12 Hours**

Media Organizations and Structure - Organizational structures of Indian media
Print and electronic media; ownership patterns of Indian media
Organizational structure and management of Indian news agencies.

Unit – III: Audience Measurement **12 Hours**

Media evaluation -Circulation and revenue
Readership measurement systems, ABC, NRS, INS, RNI.
Viewership measurement systems - TRP, TAM, INTAY and other rating systems.

Unit – IV: Issues Related to Media Management **12 Hours**

Global competition on Indian Media Committees
Reports for committees/commissions; S K Patil committee report; Ashok Chanda committee report; BG Varghese committee report, Khosla committee report; Joshi committee report; P R Ramaiah committee report.

Practical Component

- Visit to the Media Organization
- Media Evaluation- Readership, Circulation and Popularity
- Report Writing and Presentation

References Books

1. Khandekar, Vanita Kohli .2006. *The Indian Media Business*. New Delhi: Sage Publication.
2. James Redmind and Robert. 2004. *Media Organization Management*. Biztantra: London Response Books,
3. Stantton, W.J. and Futrell, Charles .2003. *Fundamental &Marketing*. New Delhi : MC Graw Hill.
4. Cabera, E F and Bonache. 1999. An Expert H. R. *System for Aligning Organizational Culture &Strategy.* New York: Academic Press.
5. Gouldon, Thons, 1997. *News Management*. London: Willian Heiremamm Ltd.
6. C, Halzer. 1991. *Total Quality Management*. London: Champra & Hall.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE612	**NEW MEDIA-VII**	SC	2	0	2	4	4

Course Description:

This course provides the students with a critical introduction to the emerging "wired" or "cyber" technologies and the economic and political implications of the same. In this course, the students will learn about the historical development of the Internet and other forms of new media and examine the

repercussions of the digital revolution for our communities, identities, politics, and our daily lives. Students will further learn how to create a web page and how to blog.

Course Objectives:

- Through a variety of online and offline projects, students will develop the skills needed to be an active participant in the new media culture.
- To enable the students to develop a critical, sociologically and historically informed perspective on the digital communication revolution and the Internet

Course Outcomes:

At the end of this course, the students will be able to-

- Define and discuss key theoretical concepts related to new media studies
- Develop technical proficiency to be an active participant in the new media culture.
- Identify and assess the social, cultural and political implications of new media production and consumption process.

Course Content:

Unit – I: Introduction To New Media **12 Hours**

Introduction to New Media- Meaning and characteristics
Interactivity and New Media
Economics of New Media
Intranet to Internet; Information & Knowledge Society
Social Media, Youth and Social Networking; Ethical issues with Social Networking

Unit – II: Impact Of New Media On Journalism **12 Hours**

Understanding New Media- Impact of new media on journalism
Difference of elements between web journalism, traditional journalism and other media
Characteristics of the online writer/journalist; Trends in web/online journalism
Journalism ethics and restraint in new media-Accuracy, Privacy, Fairness, Linking, Journalistic integrity, Questions of Plagiarism;

Unit – III: Writing For The Web **12 Hours**

Linear vs. nonlinear form
Writing for the screen vs. writing for print
Web page writing and editing techniques
Website vs. web-portal
Web site planning, design and the writer- Basic HTML for writers;
Audience analysis; Content planning, structure; Copyright issues;
Visual Design; Web page elements

Unit – IV: New Media And Society **12 Hours**

Networked Societies
Social relationship and Identity-Online and Offline
E-Governance; Innovations in E-Governance
New Media as Surveillance Technology
Activism in Cyber Space

Practical Component

- An observational field project on use of New media in Panchyats/ rural areas.
- Creating a news portal.
- Learning the basics of the production of a podcast.
- Actively participate in a Cyber Media campaign or do a report on Cyber Activism
- Observational studies on Surveillance technologies, Youth and Social Networking

References Books:

1. Hand Book of New Media by Lievrouw and Livingston, Sage (Student Edition)
2. Stephen McDowell & Kartik Pashupati (nd) 'India's Internet policies: ownership, control, and purposes'; Unpublished Paper.
3. Kahn, R and D Kellner, 2004 "New Media and Internet Activism: From The Battle of Seattle to Blogging' *New Media & Society*, Vol. 6, No. 1, 87-95
4. Castells, Manual. 2004 *The Network Society: a cross-cultural perspective,* Edward Elgar, MA (Chapter 1. Informationalism, networks, and the network society: a theoretical blueprint pp.3-45.)
5. Gill, S.S 2004, *India's Information Revolution: A Critique*; Rupa, Delhi, 2004.
6. Van Dijk, J. A. G. M. 2005 " *The Network Society : Social Aspects of New Media",* Sage Publications,
7. Why activists cannot afford to neglect the Internet by Arun Mehta from The Public Domain *Sarai Reader 01 (*P 140-146)
8. Lister, Martin : K. Kelly; J. Dovey S Giddings; & I Grant: 2008, New Media: A Critical Introduction , 2nd Routledge, London
9. Everett, A. (2003). Digitextuality and click theory: Theses on convergence media in the digital age. In A. Everett, ed. & J. Caldwell (Eds.), New media: Theories and practices of digitextuality (pp. 1–28). New York: Routledge.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE622	**Technology for Communication-VIII**	SC	2	0	2	4	4

Course Description:

This course is designed to provide the students with detailed insight into the significance of technology for communication. Students in the process shall gain an understanding of how technology has become a dominant factor in shaping various multi-media elements and mastering these technical aspects would help the students in technical skill development.

Course Objectives

- To help the students understand the importance of technology in communication.
- To explain students the technical aspects in media.
- To learn the technology used for communication purpose and gain knowledge of media production softwares.

Course Outcomes:

After the successful completion of the course, students will be able to-

- Understand the importance of technology in communication
- Identify the use of accurate technology for various media colleterals
- Adopt and create various multi-media products

UNIT I

Introduction to computer – history, software and hardware, Devices: input, output, primary and secondary storage device. Computer networking and Internet issues: LAN, MAN, CAN, MAN, advantages and disadvantages of networking and the Internet. World Wide Web (WWW), and Basics of Internet

UNIT II

Graphic Designing- Introduction to Photoshop, Photo editing , colour and tone correction, Image size, Selection , Grid and Guides, Masks , Channel , Painting and Editing Layers, Filters, Actions , Automation , Preparing Images For Print and Web Working with 3D layers.

UNIT III

Layout designing- Quark Express basics, Adobe In design: Layout designing, working with text and graphics, column alignment, column guide, auto flow, indexing, importing text, images. Publishing books, Multilayer newsletters, Documents, Creation of E-books, E-Brochure, Exporting content for web

UNIT IV

Website Development- Introduction Work Flow, Property window, site concept saving, Adding Images and Multimedia (Graphics, Flash , animation) content, Planning Layout, Using frames, Multiple WebPages, DHTML, Layers, Cascading Style Sheets (CSS) Tables

Practical Component

- News Letter Design
- Logo or Greeting Card Making
- Photo editing- Retouching and Image Manipulations
- Creating Poster, brochure, Magazine covers

Text Books And Reference Books:

1. Introduction to computers – PeterNorton – TataMcGraw hill – 2005 Edition
2. Adobe Photoshop CS3 Bible , LaurieUlrichFuller and RobertCFuller

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE603	**ENGLISH LITERATURE & Language- VIII: Indian Writings in English - II**	SC	4	0	0	4	4

Course Desription:

This course is the higher level of the former course on Indian Writings in English. In the course design, the texts are carefully selected in order to equip and empower the students to develop an intense understanding of the postcolonial body of Indian English literature that would trigger in them an urge to critically analyze the literary works but also the socio-cultural issues which contributed to the development of the Indian English Literature.

Course Objectives:

- To intensify the knowledge of the students in the field of Indian Writings in English.
- To develop in the students a greater understanding of the literary and political issues that Indian Writings in English addresses in the cotemporary period.
- To develop in the students the ability to critically address postcolonial issues.

Course Outcomes:

On completion of the course the students will be able to:

- Explain the various issues dealt by contemporary poets of Indian Writings in English.
- Analyze the major features in the fictional narratives of Indian Writings in English.
- Demonstrate familiarity with concerns specific to India as presented in non-fictional works by Indians writing in English.

Course Content:

Unit-I: Poetry **12 Hours**

1. Nissim Ezekiel – Goodbye Party for Miss Pushpa T.S.
2. Keki Daruwala – Migrations
3. Kabita Sinha – Eve Speaks to God
4. K. Satchidandan – Gandhi and the Poem
5. Chandrashekara Kambar – Fiend of Folktales
6. Jyoti Lanjewar – Mother

Unit-II: Short Fiction **12 Hours**

1. O.V. Vijayan – After the Hanging
2. Githa Hariharan – The Remains of the Feast
3. Temsula Ao – The Jungle Major

Unit-III: Essays **12 Hours**

1. Sudhir Kakar – Feminine Identity in India (Extract from *The Inner World)*
2. Rajeshwari Sunder Rajan - Language Debate (Extract from *Lie of the Land)*

Unit-IV: Drama/ Novel **12 Hours**

1. Mahesh Dattani – *Dance Like a Man*
2. Mahasweta Devi – *Mother of 1084*

Reference Books:

1. Dattani, Mahesh. *Dance Like a Man*. Penguin, 2006.
2. Devi, Mahashweta. *Mother of 1084*. Penguin, 2014.

3. Kakar, Sudhir. *The Inner World: A Psychoanalytic Study of Childhood and Society in India*. Oxford, 2012.
4. Hariharan, Githa. *The Art of Dying*. Penguin, 1993.
5. Vijayan, O.V. *After the Hanging and Other Short Stories*. Penguin, 1990.
6. Ezekiel, Nissim. *Collected Poems*. Oxford, 2005.
7. Daruwala, Keki. *Collected Poems 1970-2005.* Penguin, 2006.
8. Satchidanandan, K. *While I Write: New and Selected Poems*. HarperCollins, 2011.
9. Merhotra, A.K. *The Oxford Indian Anthology of Twelve Modern Indian Poets*. Oxford, 1997.
10. Ao, Temsula. *These Hills Called Home: Stories from a War Zone*. Penguin India, 2005.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE604	**English Literature & Language-VIII: European & Non-European Literature - II**	SC	4	0	0	4	4

Course Desription:

This course is specially designed to engage the students into the wider discourse of European and Non-European literatures, specifically to develop in them a critical awareness of the world literature at large. Another motive behind such an intense framing is that the students would be more sensitive to the issues of the world literature, history and politics after the completion of the course.

Course Objectives:

- To develop the students to respond to the works of the significant authors of the European and Non-European Literature.
- To sensitize the students towards the socio-political and cultural issues as represented in the select European and Non-European literary texts.

Course Outcomes:

On completion of the course the students will be able to:

- Demonstrate a good understanding of the issues that contributed to the development of the discourse of world literature.
- Explain the various issues presented in postcolonial and neo-colonial poetry from all over the world.
- Develop an initial association with the fictional works of postcolonial writers from various nations.
- Outline the characteristic features of postcolonialism.

Course Content:

Unit-I: Poetry **12 Hours**

1. Pablo Neruda – I am Explaining a Few Things
2. A.D. Hope – Australia
3. Margaret Atwood – Helen of Troy Does Countertop Dancing
4. Zulfikar Ghose – This Landscape, These People
5. Gabriel Okara – You Laughed and Laughed and Laughed
6. Yasmine Gooneratne – On an Asian Poet Fallen Among Americans

Unit-II: Short Fiction **12 Hours**

1. Katherine Mansfield – The Garden Party
2. Gabriel Garcia Marquez – A Very Old Man with Enormous Wings
3. Jorge Luis Borges – The Gospel According to Mark

Unit-III: Essays **12 Hours**

1. Ngugi - Abolition of English Department
2. Loomba, Ania. *Colonialism/ Postcolonialism* (Extract)

Unit-IV: Drama/ Novel **12 Hours**

1. Chinua Achebe – *Things Fall Apart*
2. Jean Rhys – *Wide Sargasso Sea*

Reference Books:

1. Neruda, Pablo. *The Essential Neruda: Selected Poems*. City Light Books, 2014.
2. Hope, A.D. *A.D. Hope: Selected Prose and Poetry*. Halstead, 2000.
3. Atwood Margaret. *Eating Fire: Selected Poetry 1965-1995*. Little Brown Book Group, 2010.
4. Ghose, Zulfikar. *50 Poems*. OUP Pakistan, 2010.
5. Okara, Gabriel. *Gabriel Okara: Collected Poems*. University of Nebraska Press, 2016.
6. Marquez, Gabriel Garcia. *Collected Stories*. Penguin, 2000.
7. Mansfield, Katherine. *The Garden Party and Other Stories*. Penguin, 2007.
8. Rhys, Jean. *Wide Sargasso Sea*. Penguin, 2000.
9. Achebe, Chinua. *Things Fall Apart*. Penguin, 2001.
10. Loomba, Ania. *Colonialism/ Postcolonialism*. Routledge, 2016.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE605	**Industrial Psychology-II**	HC	2	0	2	4	4

Course Description:

Industrial psychology combines the principles of psychology with a methodical investigation of various work settings. Often referred to as industrial-organizational psychology, this discipline analyzes numerous aspects of the working world and the attitudes of individuals toward their respective careers. Industrial psychology concerns itself with the application of psychological concepts to the work environment. Professionals who hold degrees in the discipline often perform consulting work for companies.

Course Objectives:

1. Students will acquire knowledge required for the practice of industrial-organizational psychology and human resource management.
2. Students will develop skills required to engage in the practice of industrial-organizational psychology and human resource management.
3. Students will acquire methodological and analytic knowledge and skills that enable them to function as scientist-practitioners in industrial-organizational psychology and human resource management.

Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Demonstrate a solid fundamental knowledge of psychology as a discipline. This will include both knowledge of the history of the field, but also of the current facets, theoretical perspectives, and the divisions within the broad field of Psychology.
2. Analyze psychological research in the nfieldm of organizational behavior in terms of forming hypotheses, collecting, analyzing and interpreting the data necessary to test the hypotheses, and thinking critically about the obtained results.
3. Comprehend the domains that comprise the core of I-O Psychology, which include: 1) ethical, legal, and professional contexts, 2) measurement of individual dfferences, 3) criterion theory and development, 4) job and task analysis, 5) employee selection, 6) performance appraisal, 7) training and development, 8) work motivation, and 9) attitude theories.
4. Practice of I-O psychology by applying the concepts in the field of I-O psychology to the functioning of organizations.

Course Content:

Unit-I: Performance Appraisal **12 Hours**

1. Performance Appraisal: Definition, Need for Performance Appraisal,

2. Techniques of Performance Appraisal Methods –(a) Objective Performance Appraisal methods. b) Judgmental Performance Appraisal Methods; 360* Feedback. Bias in Performance Appraisal. How to Improve Performance Appraisals.

Unit-II: Job Satisfaction, Industrial Morale & Leadership 12 Hours

a). Studying Job Satisfaction-Benefits of job satisfaction studies, Use of Existing job satisfaction Information, Factors influencing on job satisfaction.

b) Industrial Morale**:** Nature and characteristics, importance of industrial morale.

c) Leadership – definition and nature, styles of leadership-authoritarian & democratic leaders, Transactional & Transformational leaders, Team work, Team cycle and team building.

Unit-III: Employee Attitudes and Their Effects 12 Hours

The Nature of Employees Attitudes - Job satisfaction, Job Involvement, Organizational Commitment, Work Moods.

1. The Nature of Employees Attitudes - Job satisfaction, Job Involvement, Organizational Commitment, Work Moods.
2. Effects of Employee Attitudes - Employee Performance, Turnover, Absence & Tardiness, Theft, Violence, Other Effects.

Unit-IV: Employee Stress And Employee Counseling 12 Hours

1. Employee stress: Definition of Employee Stress, Extreme Products of Stress, Causes of Stress, Stress& Job Performance, Individual differences in Stress Response. Approaches to Stress Management.
2. Employee Counseling –Nature of counseling, Functions of Counseling, Types of Counseling

PRACTICAL -VII : DESSERTATION WORK: Based on their Interest.

References:

1. Schultz D.P. and Schultz E.S –Psychology & Work Today Eighth Edition ,Pearson Education, Inc. and Dorling Kinderssley Publishing Inc.

2. John W Newstrom- Organizational Behaviour-Human Behaviour at Work. Twelfth Edition Tata McGraw-Hill Publishing Company Limited.New Delhi.

3. Girishbala Mohanty-Industrial Psychology and Organisational Behaviour, Kalyani Publishers, Ludhiana

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE616	**Abnormal Psychology-II**	SC	2	0	2	4	4

Course Description:

This course provides an examination of the various psychological disorders as well as theoretical, clinical, and experimental perspectives of the study of psychopathology. Emphasis is on terminology, classification, etiology, assessment, and treatment of the major disorders. Upon completion, students should be able to distinguish between normal and abnormal behavior patterns as well as demonstrate knowledge of etiology, symptoms, and therapeutic techniques. Course work includes projects. *This course has been approved to satisfy the Comprehensive Articulation Agreement for the general education core requirement in social/behavioral sciences.*

Course Objectives:

1. Students will learn the categories and descriptions of the leading mental disorders.
2. Students will learn the different theoretical models explaining the causes of the disorders, and the empirical evidence linking biological, cognitive, emotional, behavioral, and social/cultural factors with each disorder.
3. Students will learn how mental disorders are assessed, and the leading evidence-based methods of treatment.
4. Students will learn how to use critical reasoning skills to apply theoretical concepts and empirical evidence to the understanding of mental health issues, including hypothetical clinical cases.

Course Outcomes:

Upon successful completion of this course, students will be able to:

1. Compare and contrast biological, psychological, family, and social views of the causes and treatment of abnormal behavior.
2. Identify and compare major scientific methods for gathering and analyzing information to describe abnormal behavior.
3. Identify the difference between organic and functional disorders.
4. List and/or recognize the characteristics of specific anxiety, somatoform, mood, eating, sleep, sexual-identity, substance abuse, personality, schizophrenic and cognitive disorders.
5. Recognize unethical therapeutic practices according to the American Psychological Association Guidelines.

Course Content:

Unit-I: Anxiety Disorders **12 Hours**

a. Generalized anxiety disorder, Phobic disorders, Panic disorder, Obsessive-compulsive disorder (OCD)
b. Treatment of anxiety disorders.

Unit-II: Somatoform Disorders **12 Hours**

Somatoform Disorders: Pain Disorder, Body Dysmorphic Disorder, Hypochondriasis, Somatization Disorder, Conversion Disorder, Treatment of Somatoform Disorders.

Unit-III: Mood Disorders **12 Hours**

Mood Disorders: Clinical Descriptions and Epidemiology of Mood Disorders, Etiology of Mood Disorders, Treatment of Mood Disorders.

Unit-IV: Schizophrenia & Brain Disorders **12 Hours**

a. Schizophrenia: Clinical Descriptions of Schizophrenia, Etiology of Schizophrenia, Treatment of Schizophrenia.

b. Brain disorders and other cognitive impairments: Dementia, Delusion, Delirium & Mental retardation: Microcephaly, Hydrocephaly, Macrocephaly.

Reference Books:

1. Alloy, L.B., Riskind, JH., and Manos,M.J. (2006). Abnormal Psychology – Current Perspectives. 9th Edition. New Delhi: Tata McGraw- Hill Edition.
2. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed., text revision). Washington, DC: Author.
3. Barlow,D.H. and Durand,M.V. (2000). Abnormal Psychology. 2nd Edition. New Delhi: Thomson Publication.
4. Bootzin,R.B.,Acocella,J.R. and Alloy,L.B. (1993). Abnormal Psychology–Current perspectives. 6th Edition, International Edition,Tata Graw –Hill Inc., USA.
5. Carson, R.C., Butcher, J.N and Mineka ,S.(2004). Abnormal psychology. 13th Edition. New Delhi: Pearson Education.
6. Davidson and Neal (1996). Abnormal psychology. Revised 6th Edition, John Wiley Sons World Health Organization. (2008). ICD-10: International statistical classification of diseases and related health problems (10th Rev. ed.). New York, NY: Author.
7. Sue,D.,Sue,,D and Sue.S. (1990). Understanding Abnormal Behaviour. 3rd Edition, Houghton Miffin Co.

Course Code	Course Title	Course Type	L	T	P	C	Hrs./ Wk.
17JE626	**Health Psychology-II**	SC	2	0	2	4	4

Course Description:

This is an advanced course in psychology designed to give a broad overview of the field of health psychology. Health psychology is a relatively young, diverse, and multidisciplinary field that

examines the mind-body connection and many factors that influence the individual's well-being. In this course, students will explore how biological, psychological and social factors are connected and how they may influence health consequences. Following this bio-psychosocial approach, potential biological, psycho physiological, and behavioral pathways to health and disease will be explored. By the end of the course, I hope that students would gain fundamental knowledge of the field of health psychology, develop skills for critically evaluating health psychology research, and understand how health psychology may be applied to promote their own well-being.

Course Objectives:

Students are expected to develop an understanding of health psychology and gain skills in the following:

1. To critically examine Eating behavior and disorders.
2. To articulate the basic premises and theories of pain.
3. To describe and appraise human sexual behavior, sexual disorders and prevention of sexual disorders.
4. To discuss the life style disorders and its orevention.

Course Outcomes :

Upon successful completion of this course, students will be able to:

1. Demonstrate factors influencing on eating behavior, types of eating disorders and prevetion of eating disorders.
2. Evaluate the factors influencing the pain and find out the preventive measure to reduce the pain.
3. Comprehend the concept of sex and its disorders and intervention measures.
4. Analyse the human life style disorders and preventive measures to live a positive life.

Course Content:

Unit-I: Eating Behaviour and Exercise **12 Hours**

a. Eating Behaviour: what is a healthy diet?, the causes of body dissatisfaction-Social factors, psychological factors; DIETING.

b. Exercise: developing the contemporary concern with exercise behaviour, the physical & psychological benefits of exercise.

Unit-II: Pain **12 Hours**

a) Nature of pain; early pain theories; the gate control theory of pain;
b) The role of psychosocial factors in pain perception; subjective –affective – cognitive processes.
c) The role of psychology in pain treatment; CBT.

d) Managing pain – biofeedback, relaxation technique, hypnosis, acupuncture, distraction, guided imagery.

Unit-III: Sex **12 Hours**

Developing the contemporary research perspectives on sex, sex as a risk in the context of STDs/HIV and AIDS, the broader social context-Sex education, Power relations between men and women, Social norms of the gay community, Discourses about sex.

Unit-IV: Life Style Disorders, Hiv And Cancer **12 Hours**

a) CHD (Coronary Heart Disease) – Nature of CHD; Cardiovascular reactivity, hostility and CHD; Women and CHD; Depression and CHD, Type A behaviour.
   1) Hypertension – An overview – Stress and Personality
   2) Diabetes – Types; Implications;
b) HIV and AIDS
c) CANCER: Introduction to cancer, The prevalence of cancer, The psychosocial factors in the initiation and promotion of cancer, Psychological consequences of cancer, Psychology and the alleviation of symptoms.

Practicals -VIII: Assessment

1. Beck's Depression Inventory.
2. Beck's Anxiety Inventory
3. General Health Questionnaire.
4. 16 Personality factors.
5. Multiphasic Personality Questionnaire.

Reference Books:

1. Jane Ogden (2010) Health Psychology – a text book, 4th edition, Tata McGraw Hill Education Private Limited, New Delhi.
2. Shelley E. Taylor (2006) Health Psychology – 6th Edition, Tata McGraw Hill Education Private Limited, New Delhi.
3. Steve R. Baumgardner & Marie K. Crothers (2009) Positive Psychology, Dorling Kindersley (India) Pvt. Ltd., licensees of Pearson Education in South Asia.
4. M. Robin Dimatteo & Leslie R. Martin (2002) Health Psychology –, Dorling Kindersley (India) Pvt. Ltd, licensees of Pearson Education in South Asia.
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CAREER COUNSELING AND PLACEMENT

Having a degree will open doors to the world of opportunities for you. But Employers are looking for much more than just a degree. They want graduates who stand out from the crowd and exhibit real life skills that can be applied to their organizations. Examples of such popular skills employers look for include:

1. Willingness to learn
2. Self motivation
3. Team work
4. Communication skills and application of these skills to real scenarios
5. Requirement of gathering, design and analysis, development and testing skills
6. Analytical and Technical skills
7. Computer skills
8. Internet searching skills
9. Information consolidation and presentation skills
10. Role play
11. Group discussion, and so on

REVA University therefore, has given utmost importance to develop these skills through variety of training programs and such other activities that induce the said skills among all students. A full-fledged Career Counseling and Placement division, namely Career Development Center (CDC) headed by well experienced senior Professor and Dean and supported by dynamic trainers, counselors and placement officers and other efficient supportive team does handle all aspects of Internships and placements for the students of REVA University. The prime objective of the CDC is to liaison between REVA graduating students and industries by providing a common platform where the prospective employer companies can identify suitable candidates for placement in their respective organization. The CDC organizes pre-placement training by professionals and also arranges expert talks to our students. It facilitates students to career guidance and improve their employability. In addition, CDC forms teams to perform mock interviews. It makes you to enjoy working with such teams and learn many things apart from working together in a team. It also makes you to participate in various student clubs which helps in developing team culture, variety of job skills and overall personality.

The need of the hour in the field of Commerce is efficient leaders of repute, who can deal the real time problems with a flavour of innovation. This kept in focus, the CDC has designed the training process, which will commence from second semester along with the curriculum. Special coaching in personality development, career building, English proficiency, reasoning, puzzles, leadership, and strategic management and communication skills to every student of REVA University is given with utmost care. The process involves continuous training and monitoring the students to develop their soft skills including interpersonal skills that will fetch them a job of repute in the area of his / her interest and march forward to make better career.

The University has recognized skill development and industry relationship as its very important activities. Therefore, the University-Industry Interaction and Skill Development Centre headed by a Senior Professor & Director has been established to facilitate skill related training to REVA students and other unemployed students around REVA campus. The center conducts variety of skill development programs to students to suite to their career opportunities. Through this skill development centre the students shall compulsorily complete at least two skill / certification based programs before the completion of their degree. The University has collaborations with Industries, Corporate training organizations, research institutions and Government agencies like NSDC (National Skill Development Corporation) to conduct certification programs. REVA University has been recognised as a Centre of Skill Development and Training by NSDC (National Skill Development Corporation) under Pradhan Mantri Kaushal Vikas Yojana.

The University has signed MOU's with Multi-National Companies, research institutions, Government agencies like NSDC (National Skill Development Corporation) and universities abroad to facilitate greater opportunities of employability, students' exchange programs for higher learning and for conducting certification programs.

FACULTY MEMBERS

Sl. No.	Name of the Faculty	Designation
1.	Dr. Payel Dutta Choudhary	Director
2.	Mr. Manjunath M	Program Co-ordinator, Assistant Professor
3.	Dr. Hemantha Kumara V	Assistant Professor
4	Ms. Sudeshna Das	Assistant Professor
5.	Dr. Srinivasa Murthy	Senior Assistant Professor
6.	Ms. Slyla Abraham	Assistant Professor
7.	Mr. Lingappa	Assistant Professor
8.	Ms. Vijayalakshmi Sam	Assistant Professor
9.	Mr. Lingappa	Assistant Professor
10.	Ms. Ritushree Sengupta	Assistant Professor
11.	Ms. Swathika Y. S.	Assistant Professor

DO'S AND DON'TS

DO'S

Maintain discipline and respect the rules and regulations of the university
Be regular and punctual to classes
Study regularly and submit assignments on time
Be respectful to your colleagues/friends and hostel staff/management.
Read the notice board (both at your college and the hostel) regularly.
Utilize your Personal Computer for educational purpose only.
Follow the code of conduct.
Visit Health Center on the campus whenever you are unwell.
Be security conscious and take care of your valuables especially Cash, Mobile Phones, Laptop and other valuables.
Carry your valuables along with you whenever you proceed on leave/vacation.
Use electric appliances, lights and water optimally.
Keep the campus clean and hygienic.

DON'TS

Ragging inside / outside the campus.
Possession of Fire arms and daggers etc.
Use of Alcohols, Toxic drugs, sheesha, gutkha and hashish/heroin etc.
Use of Crackers, explosives and ammunition etc.
Smoking and keeping any kind of such items.
Misusing college & hostel premises/facilities for activities other than studies.
Playing loud music in the room which may disturb studies of colleagues / neighbours.
Making noise and raising slogans.
Keeping electrical appliances, other than authorized ones.
Involvement in politics, ethnic, sectarian and other undesirable activities.
Proxy in any manner.
Use of mobiles in the classrooms.

Note: 1. Rules are revised / reviewed as and when required.
2. Healthy suggestions are welcome for betterment of Institution