SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES

(AUTONOMOUS)

Dr. Visweswaraiah Road, (Bangalore-Tirupathi Bye-pass Road),Murukambattu,Chittoor– 517127,AndhraPradesh,India.

B.Tech
(1-4 Semester)
Course Structures and Syllabi
Under R20 Regulations

Department of Civil Engineering

SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES, CHITTOOR, (AUTONOMOUS)

Institute Vision

To emerge as a Centre of Excellence for Learning and Research in the domains of engineering, computing and management.

Institute Mission

IM1: Provide congenial academic ambience with state - of -art of resources for learning and research.

IM2: Ignite the students to acquire self-reliance in the latest technologies.

IM3: Unleash and encourage the innate potential and creativity of students.

IM4: Inculcate confidence to face and experience new challenges.

IM5: Foster enterprising spirit among students.

IM6: Work collaboratively with technical Institutes / Universities / Industries of National and International repute

Department Vision

To become a Centre of excellence in Civil Engineering and provide professional competency, academia and practical skills to the students so as to meet the current and future challenges of infrastructure development of theNation

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Department Mission

DM1: Provide congenial academic ambience with necessary infrastructure and learning resources

DM2: Inculcate confidence to face and experience new challenges from industry and society.

DM3: Ignite the students to acquire self-reliance in State-of-the-Art Technologies

DM4: Foster Enterprising spirit among students

Program Educational Objectives (PEOs)

Graduates of civil Engineering shall

PEO1: Have Professional competency through the application of knowledge gained from subjects like Mathematics, Physics, Chemistry, Inter-Disciplinary and core subjects like Surveying, Building Planning, Construction materials, analysis and design of Civil structures, Environmental and Transportation Engineering **(Professional Competency)**.

PEO2: Excel in one's career by critical thinking towards successful services and growth of the organization or as an entrepreneur or through higher studies. **(Successful Career Goals).**

PEO3: Enhance knowledge by updating advanced technological concepts for facing the rapidly changing world and contribute to society through innovation and creativity **(Continuing Education and Contribution to Society).**

Program Outcomes

On Successful completion, the graduate will be able to,

PO1-Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2-Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3-Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4-Conduct Investigations of Complex Problems: 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.

PO5-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.

PO6-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.

PO7-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.

PO8-Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9-Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10-Communication: Communicate effectively on complex engineering activities with the engineering community and with society at

large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11-Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12-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.

Program Specific Outcomes (PSO's)

After the completion of the Program, The student shall able to,

PSO1: Apply the knowledge obtained in core areas for the analysis and design civil Engineering structures using relevant codes of practice, materials, techniques andsoftware.

PSO2: Adapt state-of-the-art practices and materials in civil Engineering projects with human values and ethics with team spirit

ACADEMIC REGULATIONS (R-20) FOR B.TECH (Regular-Full Time)
(Effective for the students admitted into I year from the Academic Year 2020-2021 and II year lateral entry from the Academic year 2021-2022 onwards)

Curriculum for Regular and Honors/Minors B.Tech Program of all Branches

1. Eligibility for Admission

1.1 Admission of the B.Tech program shall be made subjects to the eligibility qualifications and Specialization prescribed by the University for each Program from time to time and also as per the guidelines of Andhra Pradesh State Council of Higher Education (APSCHE).

1.2 Admission shall be made either on the basis of Merit / Rank Obtained by the Qualifying candidates in EAMCET/ECET or otherwise specified whichever is relevant.

2. Award of the Degree: A student will be declared eligible for the award of B. Tech. degree if he/she fulfills the following:

i. For regular entry students, shall pursues a course of study in not less than four and not more than eight academic years.

ii. For lateral entry students, shall pursue a course of study for not less than three academic years and in not more than six academic years.

iii. For regular entry students, after eight academic years from the year of their admission, he/she shall forfeit their seat in B.Tech course and their admission stands cancelled.

iv. For lateral entry students, after six academic years from the year of their admission, he/she shall forfeit their seat in B.Tech course and their admission stands cancelled.

v. For regular entry students shall register for 160 credits and must secure all the 160 credits. For lateral entry students shall register for 121 credits and secure all 121 credits

vi. A student shall be eligible for the award of B.Tech degree with Honors or Minor if he/she earns 20 credits in addition to the 160 credits for Regular entry students /121 credits for lateral entry students.

vii. A student shall be permitted to register either for Honors or for Minor and not for both simultaneously.

3. Structure of the Undergraduate Engineering program:

All subjects / courses offered for the under graduate program in B.Tech. Degree programs are broadly classified as follows.

S.No	Course Classification	Course Category	Course Code
1	Foundation Courses	Humanities and Social Science including Management Courses	HSM
		Basic Science Courses	BSC
		Engineering Science Courses	ESC
2	Core Courses	Professional Core Courses	PCC
3	Elective Courses	Professional Elective Courses	PEC
		Open Elective Courses	OEC
4	Employability Enhancement Courses	Internship, Seminar and Project Work	PROJ
		Skill Oriented Courses /Skill Advanced Courses	SOC/SAC
5	Audit Courses	Mandatory Audit Courses	MAC
6	Minor/Honor Courses	Minor Courses/Honor Courses	MR/HR

4. Assigning of Credits:

i. 1 Hr. Lecture (L) per week – 1 Credit
ii. 1 Hr. Tutorial (T) per week– 1 Credit
iii. 1 Hr. Practical (P) per week – 0.5 Credits
iv. 2 Hours Practical (Lab) per week – 1 Credit

5. Induction Program for I. B.Tech Program

i. There shall be mandatory student induction program for fresher's, with a three-week duration before the commencement of first semester.
ii. Physical activity, Creative Arts, Universal Human Values, Literary, Proficiency Modules, Lectures by Eminent People, Visits to local Areas, Familiarization to Department / Branch and Innovations etc., shall be included in the guidelines issued by AICTE.

6. Assessment

i. The performance of a student in each semester shall be evaluated subject wise with a maximum of 100 marks for theory as well as for practical subject and project work.

ii. The audit courses shall be evaluated for a maximum of 30 internal marks.

iii. For theory and practical subjects the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End Semester Examinations.

iv. A student has to secure not less than 35% of marks in the end semester examination and minimum 40% of marks in the sum total of Internal Examination and End Semester Examinations marks to earn the credits allotted to each course.

6.1 Internal Examination

6.1.1 For theory subjects, during the semester, there shall be two Mid-Term Examinations will be conducted.

6.1.2 Each Mid-Term Examination consists of objective paper for 10 marks and subjective paper for 15 marks with the duration of 1 hour 50 minutes (20 minutes for objective and 90 minutes for subjective paper).

6.1.3 The subjective paper shall contain 3 either-or type questions with equal Weightage of 10 marks and the marks obtained for 3 questions shall be condensed to 15 marks; any fraction shall be rounded off to the next higher mark.

6.1.4 If the student is absent for the any internal examination, no re-exam or make up exam shall be conducted and marks for that examination shall be considered as zero.

6.1.5 First Mid-Term Examination shall be conducted for I & II units of syllabus and second Mid-Term Examinations shall be conducted for III, IV & V units.

6.1.6 However 5 marks are awarded for 5 Assignments (unit-wise).

6.1.7 Final Internal marks shall be arrived at by considering the marks secured by the student in both the Mid-Term examinations with 80% weightage to the better mid exam and 20% to the other

For Example:

- Marks obtained in First Mid-Term: 25
- Marks obtained in Second Mid-Term: 25
- Internal Marks: (25x0.8) + (25x0.2) = 25
- Final internal marks = Internal Marks +

Assignment marks

6.1.8 If the student is absent for any one Mid-Term Examinations, the final internal marks shall be arrived at by considering 80% Weightage to the marks secured by the student in the appeared examination and zero to the other.

For Example:

- Marks obtained in First Mid-Term: Absent
- Marks obtained in Second Mid-Term: 25
- Internal Marks: (25x0.8) + (0x0.2) = 20
- Final internal marks = Internal Marks + Assignment marks

6.1.9 For practical courses there shall be 30 internal marks. 15 marks allotted for Internal Practical Examination to be conducted before the last working day and 15 marks for Day-to-Day work in the laboratory shall be evaluated by the concerned laboratory teacher based on the regularity / record / viva-voce.

6.1.10 In a practical subject consisting of two parts (ex: Engineering Workshop & IT Workshop), Internal examination shall be evaluated as above for 30 marks in each part and final internal marks shall be arrived by considering the average of marks obtained in two parts.

6.1.11 The evaluation of the practical courses is done based on the rubrics designed for that curriculum component.

6.2 Semester End Examination

6.2.1 End examination of theory courses shall have the following pattern:

i. There shall be two parts, Part-A and Part-B.
ii. Part-A shall contain 10 compulsory short answer questions for a total of 20 marks such that each question carries 2 marks. There shall be 2 short answer questions from each unit.
iii. Part-B Shall be either-or type questions of 10 marks each. Student shall answer any one of it.
iv. Each of these questions from Part-B shall cover each unit of the syllabus.

6.2.2 End examination of practical courses shall have the following pattern:

i. End Semester Examination shall be for 70 marks.
ii. The end examination shall be conducted by the concerned laboratory teacher and senior expert in the same subject of the department.
iii. In a practical subject consisting of two parts (ex: Engineering Workshop & IT Workshop), the End

Semester Examination shall be conducted for 35 marks in each part.

iv. The evaluation of the practical courses is done based on the rubrics designed for that curriculum component.

6.3 Drawing Courses

6.3.1 For the subject having design and/or drawing, such as Engineering Drawing / Graphics.

6.3.2 The distribution shall be 30 marks for internal evaluation (15 marks for Day- to-Day work (unit wise chart work / Assignment) and for another 15 marks there shall be a two MID Term exams will be conducted) and 70 marks for semester end examinations.

6.3.3 There shall be two Mid-Term examinations in a semester for duration of 2hrs each for 15 marks with weightage of 80% to better mid marks and 20% for the other.

6.3.4 The internal subjective paper shall contain 3 either-or type questions with equal Weightage of 10 marks and the marks obtained for 3 questions shall be condensed to 15 marks; any fraction shall be rounded off to the next higher mark and there shall be no objective paper in internal examination.

6.3.5 The sum of Day-to-Day work evaluation /assignments and the internal MID Term test marks will be the final internal marks for the course.

6.3.6 In the end examination pattern for Engineering Drawing / Graphics there shall be 5 questions, either-or type, of 14 marks each.

6.4 Mandatory Audit Courses

6.4.1 Courses like Human Values and Ethics, Environmental Sciences, Constitution of India and Design Thinking for Innovation shall be included in the curriculum as non-credit mandatory audit courses.

6.4.2 However, attendance in the audit courses shall be considered while calculating aggregate attendance. A student has to secure 40% of the marks allotted in the internal evaluation for passing the course.

6.4.3 The Internal Marks will be calculated similar to that of Theory course.

6.4.4 In grade sheet the completion of the course indicated as Pass – "P", and No marks or letter grade shall be allotted, for all non-credit mandatory audit courses.

6.4.5 Re-exam shall be conducted for failed candidates for every semester at a mutual convenient date of institution.

6.5 Professional Elective Courses

6.5.1 Students have to choose Professional Elective Courses PEC-I in V semester, PEC-II in VI semester and PEC-III, PEC-IV, PEC-V in VII semester, from the list of elective courses given.

6.5.2 Registration forms are invited from the students 10 days prior to the last instructional day of the preceding semester for registration process for offering the Professional Elective Courses.

6.5.3 There shall be a limit on the minimum and maximum number of registrations based on class/section strength.

6.5.4 The assessments of Professional Elective Courses are same as regular theory courses.

6.6 Open Elective Courses

6.6.1 A student shall opt for any 4 courses from the list given by the institute from time to time, complying with the requirement of the prerequisite course(s), if any.

6.6.2 Students have to choose Open Elective Courses OEC-I in V semester, OEC-II in VI semester and OEC-III, OEC-IV in VII semester, from the list of elective courses given.

6.6.3 All Open Elective Courses are offered to the students of across all branches in general.

6.6.4 Registration forms are invited from the students 10 days prior to the last instructional day of the preceding semester for registration process for offering the Open Elective Courses.

6.6.5 However, a student shall choose an open Elective from the list in such a manner that he/she has not studied the same course in any form during their Program.

6.6.6 There shall be a limit on the minimum and maximum number of registrations based on class/section strength.

6.7 Massive Online Open Courses

6.7.1 MOOC courses under Professional Elective / Open Elective

6.7.2 A student shall be permitted to pursue up to a maximum of two elective courses (Professional Elective Courses or Open Elective Courses) under MOOCs during the Program. Each of the courses must be of minimum 12 weeks in duration for 3 credits. Attendance will not be monitored for MOOC courses.

6.7.3 Student has to pursue and acquire a certificate for a MOOC course only from the organizations / agencies approved by the BoS in order to earn the 3 credits. The

Head of the department shall notify the list of such courses at the beginning of the semester.

6.8 Mandatory Internships

6.8.1 Students shall undergo two mandatory summer internships for a minimum of four weeks duration at the end of second and third year of the Program.

6.8.2 The internship can be done by the students at Local Industries, Government Organizations, Public Sector Companies, Research Laboratories, Construction agencies, Power Plants and also in software MNCs.

6.8.3 A student will be required to submit a summer internship report to the concerned department and appear for an oral presentation before the Department Evaluation Committee nominated by the Principal at the end of the semester for the evaluation of summer internship.

6.8.4 The performance of a student in each mandatory summer internships shall be evaluated with a maximum **of 100 marks.**

6.8.5 The report and the oral presentation shall carry 40% and 60% weightage respectively.

6.9 Project work and Internships

6.9.1 In the final semester, the student should undergo Internship / Project Work with well-defined objectives.

6.9.2 Students Project Batch will have maximum of four students comprising the fast and slow learners.

6.9.3 Every student shall be required to undertake a Project Work in the Institution / Internship cum Project Work in Local Industries / Government Organizations / Public Sector Companies / Research Laboratories / Construction agencies / Power Plants and also in software MNCs in consultation with Head of the Department and Department Project Evaluation Committee.

6.9.4 The Department project evaluation committee continuously monitors and evaluates the progress of the Project Work / Internship cum Project Work by conducting three reviews including abstract review during the project period.

6.9.5 During the project review meetings, batch presentation and individual contributions are monitored to assess individual student performance and also team performance.

6.9.6 The evaluation of the project is done based on the rubrics designed for that curriculum component.

6.9.7 At the end of the semester the candidate shall submit an Internship cum Project completion certificate along

with project report on the work carried out during the project work at the industry.

6.9.8 A student shall be permitted to submit project report on the work carried out during the project work at the institution/department.

6.9.9 The project work submitted to the department shall be evaluated for 100 marks, out of which 30 marks are for internal evaluation and 70 marks for external viva-voice.

6.9.10 The internal evaluation shall be made by the Department Project Evaluation Committee, on the basis of three reviews given by each students / batch on the topic of his/her project.

6.9.11 The final viva-voce shall be conducted by a committee consisting of HOD, Project Supervisor and an External Examiner nominated by the Principal at the end of the Semester.

6.9.12 In case a student fails in viva voce he /she shall reappear as and when supplementary examinations are conducted.

6.9.13 The distribution of marks for the Internal assessment and End Semester Examination is given below:

Internal Assessment (30 Marks)			**End Semester Examination (70 Marks)**		
Review - I	Review - II	Review - III	Supervisor	Internal Examiner	External Examiner
10	10	10	20	25	25

6.10 Eligibility to appear for Semester End Examinations

6.10.1 A student shall be eligible to appear for Semester End Examinations if he/she acquires a minimum of 75% of attendance in aggregate of all the courses in a semester.

6.10.2 Condonation for shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee. Shortage of Attendance below 65% in aggregate shall in NO case be condoned.

6.10.3 Students whose shortage of attendance is not condoned in any semester are not eligible to take their Semester End Examination of that class and their registration shall stand cancelled.

6.10.4 A student will not be promoted to the next semester unless he satisfies the attendance

requirements of the present semester, as applicable. They may seek readmission for that semester when offered next.

6.10.5 A stipulated fee shall be payable towards condonation of shortage of attendance to the college.

6.11 Issue of Photocopy of Answer Script

6.11.1 A student can request for the photo copy of answer script of any theory examination within one week after the declaring the results by paying fee.

6.11.2 The examination section shall issue a notification inviting applications for the issue of photocopy of answer script after publishing the results.

6.11.3 The application forms can be obtained from the examination section.

6.12 Revaluation

6.12.1 A candidate can apply for revaluation of his / her end examination answer paper in a theory courses.

6.12.2 The examination section shall issue a notification inviting applications for the revaluation after publishing the results.

6.12.3 The application forms can be obtained from the examination section.

6.12.4 A candidate can apply for revaluation of answer scripts in not more than 5 courses at a time.

6.12.5 No revaluation for practical courses, comprehensive viva-voce / Examination and project work.

6.13 Challenge Valuation

6.13.1 A student can apply for challenge valuation by prescribed fee.

6.13.2 Challenging valuation shall be carried out by an external subject expert.

6.13.3 The challenging valuation should be done strictly as per the scheme of valuation supplied by the examination section in the presence of Principal.

6.13.4 The examination section shall issue a notification inviting applications for the challenging valuation after publishing the revaluation results.

6.13.5 The application forms can be obtained from the examination section.

7. Promotion Rules

7.1 A student shall be promoted from first year to second year if he fulfills the minimum attendance requirements.

7.2 A student will be promoted from II year to III year if he fulfills the academic requirement of 40% of credits up to II year IV Semester from all the examinations, whether or not the candidate takes the examinations and secures

prescribed minimum attendance in II year IV semester.

i. **One** regular and **three** supplementary examinations of I B.Tech I Semester.
ii. **One** regular and **two** supplementary examinations of I B.Tech II Semester.
iii. **One** regular and **one** supplementary examinations of II B.Tech III Semester.
iv. **One** regular examination of II B.Tech IV semester.

7.3 A student shall be promoted from III year to IV year if he fulfills the academic requirements of 40% of the credits up to III year 6th semester from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year 6th semester.

i. **One** regular and **five** supplementary examinations of I B.Tech I Semester.
ii. **One** regular and **four** supplementary examinations of I B.Tech II Semester.
iii. **One** regular and **three** supplementary examinations of II B.Tech III Semester.
iv. **One** regular and **two** supplementary examinations of II B.Tech IV Semester.
v. **One** regular and **one** supplementary examinations of III B.Tech V Semester.
vi. **One** regular examination of III B.Tech VI Semester.

7.4 For Lateral entry student promoted from III year to IV year if he fulfills the academic requirements of 40% of the credits up to III year VI semester from all the examinations, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year VI semester.

i. One regular and three supplementary examinations of II B.Tech III Semester.
ii. One regular and two supplementary examinations of II B.Tech IV Semester.
iii. One regular and one supplementary examinations of III B.Tech V Semester.
iv. One regular examination of III B.Tech VI Semester.

8. Extra Curricular Activities

i. Students shall enroll, on admission, in any one of the personality and character development programs (NSS/YRC etc.,) and undergo training and attend a camp.
ii. The training shall include classes on hygiene and health

awareness and also training in first-aid.

iii. National Service Scheme (NSS) and Youth Red Cross (YRC) will have social service activities in and around the Institution.

iv. A student will be required to participate in an activity for an hour in a week during their second and third years.

9. Skill Oriented / Skill Advanced Courses

i. There shall be 05 Mandatory Skill-Oriented Courses offered during III to VII semesters.

ii. The list of such courses shall be included in the curriculum structure of each branch of Engineering.

10. Curricular Framework for Honors Program

i. Under Graduate degree with Honors shall be issued by the Institution to the students who fulfill all the academic eligibility requirements for the B.Tech program and Honors program.

ii. Students of a Department are eligible to opt for Honors Program offered by the same Department / Discipline, subject to a maximum of two additional courses per semester.

iii. A student shall be permitted to register for Honors program at the beginning of IV semester provided that the student must have acquired a minimum average of 8.0 SGPA upto the end of II semester without any backlogs. In case of the declaration of the III semester results after the commencement of the IV semester and if a student fails to score the required minimum of 8.0 SGPA, his/her registration for Honors Program stands cancelled and he/she shall continue with the regular Program.

iv. Students can select the additional and advanced courses from their respective branch in which they are pursuing the degree and get an honors degree in the same. In addition to fulfilling all the requisites of a Regular B.Tech. Program, a student shall earn 20 additional credits to be eligible for the award of B.Tech (Honors) degree. This is in addition to the credits essential for obtaining the Under Graduate Degree in Major Discipline (i.e. 160/121 credits).

v. Of the 20 additional Credits to be acquired, and 16 credits (four courses) shall be earned by undergoing specified courses listed as pools (two courses per pool either theory course or theory with lab component), and each carrying 4 credits. The remaining 4 credits (two courses) must be acquired through two MOOCs, which shall be domain specific, each with 2 credits and with a minimum duration of 8/12weeks as recommended by the Board of studies.

vi. The courses offered in each pool (two courses per pool) shall

be domain specific courses and advanced courses.

vii. MOOC courses must be of minimum 8 weeks in duration. Attendance will not be monitored for MOOC courses. Students have to acquire a certificate from the agencies approved by the BOS with grading or marks or pass/fail in order to earn 4 credits. If the MOOC course is a pass/fail course without any grades, the grade to be assigned will be as decided by the academic council.

viii. It is the responsibility of the student to acquire/complete prerequisite before taking the respective course.

ix. The concerned BoS shall decide on the minimum enrolments for offering Honors program by the department. If minimum enrolments criteria are not met then the students shall be permitted to register for the equivalent MOOC courses as approved by the concerned Head of the department in consultation with BoS.

x. The concerned BoS shall also consider courses listed under professional Elective Courses of the respective B.Tech programs for the requirements of B.Tech (Honors). However, a student shall be permitted to choose only those courses that he/she has not studied in any form during the Program.

xi. If a student drops or is terminated from the Honors program, the additional credits so far earned cannot be converted into open or core electives; they will remain extra. These additional courses will find mention in the transcript (but not in the degree certificate). In such cases, the student may choose between the actual grade or a "pass (P)" grade and also choose to omit the mention of the course as for the following: All the courses done under the dropped Honors will be shown in the transcript. None of the courses done under the dropped Honors will be shown in the transcript.

xii. In case a student fails to meet the CGPA requirement for Degree with Honors at any point after registration, he/she will be dropped from the list of students eligible for Degree with Honors and they will receive regular B.Tech degree only. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.

xiii. Honors must be completed simultaneously with a major degree program. A student cannot earn Honors after he/she has already earned bachelor's degree.

11. Curricular Framework for Minor Program

i. Under graduate Degree with Minor Program shall be issued by the Institution to the students who fulfill all the academic eligibility requirements for the B.Tech program and Minor Program.

ii. Students who are desirous of pursuing their special interest areas other than the chosen discipline of Engineering may opt

for additional courses in minor specialization groups offered by a department other than their parent department. For example, If Mechanical Engineering student selects subjects from Computer Science Engineering under this scheme; he/she will get Major degree of Mechanical Engineering with minor degree of Computer Science Engineering. Student can also opt for Industry relevant tracks of any branch to obtain the Minor Degree, for example, a B.Tech Mechanical student can opt for the industry relevant tracks like Data Mining track, IOT track, Machine learning track etc.

iii. The concerned BOS shall identify as many tracks as possible in the areas of emerging technologies and industrial relevance / demand. For example, the minor tracks can be the fundamental courses in CSE, ECE, EEE, CE, ME etc or industry tracks such as Artificial Intelligence (AI), Machine Learning (ML), Data Science (DS), Robotics, Electric vehicles, Virtual Realty, VLSI etc.

iv. The list of disciplines/branches eligible to opt for a particular industry relevant minor specialization shall be clearly mentioned by the respective BoS.

v. The concerned BoS shall decide on the minimum enrolments for offering Minor program by the department. If a minimum enrolments criterion is not met, then the students may be permitted to register for the equivalent MOOC courses as approved by the concerned Head of the department in consultation with BoS.

vi. A student shall be permitted to register for Minors program at the beginning of IV semester subject to a maximum of two additional courses per semester, provided that the student must have acquired 8.0 SGPA (Semester Grade point average) upto the end of II semester without any history of backlogs. It is expected that the III semester results may be announced after the commencement of the IV semester. If a student fails to acquire 8.0 SGPA upto III semesters or failed in any of the courses, his registration for Minors program shall stand cancelled. An SGPA of 8.0 has to be maintained in the subsequent semesters without any backlog in order to keep the Minors registration active.

vii. A student shall earn additional 20 credits in the specified area to be eligible for the award of B.Tech degree with Minor. This is in addition to the credits essential for obtaining the Under Graduate Degree in Major Discipline (i.e. 160/121 credits).

viii. Of the 20 additional Credits to be acquired and 16 credits shall be earned by undergoing specified courses listed in course structure and each carrying 4 credits. The remaining 4 credits must be acquired through two MOOCs, which shall be domain specific, each with 2 credits and with a minimum

duration of 8/12weeks as recommended by the Board of studies.

ix. Attendance will not be monitored for MOOC courses. Student has to acquire a certificate from the agencies approved by the BOS with grading or marks or pass/fail in order to earn 4 credits. If the MOOC course is a pass/fail course without any grades, the grade to be assigned as decided by the BoS.

x. A student shall be permitted to choose only those courses that he/she has not studied in any form during the Program.

xi. If a student drops or terminated from the Minor program, they cannot convert the earned credits into open or core electives; they will remain extra. These additional courses will find mention in the transcript (but not in the degree certificate). In such cases, the student may choose between the actual grade or a "pass (P)" grade and also choose to omit the mention of the course as for the following: All the courses done under the dropped Minors will be shown in the transcript. None of the courses done under the dropped Minor will be shown in the transcript.

xii. In case a student fails to meet the CGPA requirement for B.Tech degree with Minor at any point after registration, he/she will be dropped from the list of students eligible for degree with Minors and they will receive B.Tech degree only. However, such students will receive a separate grade sheet mentioning the additional courses completed by them.

xiii. Minor must be completed simultaneously with a major degree program. A student cannot earn the Minor after he/she has already earned bachelor's degree.

12. Grading

After each subject is evaluated for 100 marks, the marks obtained in each course will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.

Marks Range	Level	Letter Grade	Grade Point
≥ 90	Outstanding	S	10
80-89	Excellent	A	9
70-79	Very Good	B	8
60-69	Good	C	7
50-59	Fair	D	6
40-49	Satisfactory	E	5
< 40	Fail	F	0
-	Absent	Ab	0

13. Calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

i. The Semester Grade Point Average (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, i.e.

$$SGPA = \frac{\sum(C_i X G_i)}{\sum C_i}$$

where, C_i is the number of credits of the i^{th} subject and G_i is the grade point scored by the student in the i^{th} course

ii. The Cumulative Grade Point Average (CGPA) will be computed in the same manner taking into account all the courses undergone by a student over all the semesters of a program, i.e.

$$CGPA = \frac{\sum(C_j X S_j)}{\sum C_j}$$

where 'S_j' is the SGPA of the j^{th} semester and C_j is the total number of credits in that semester

iii. Both SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

iv. While computing the SGPA/CGPA, the subjects in which the student is awarded Zero grade points will also be included.

v. *Grade Point:* It is a numerical weight allotted to each letter grade on a 10-point scale.

vi. *Letter Grade:* It is an index of the performance of students in a said course. Grades are denoted by letters S, A, B, C, D, E and F.

vii. As per AICTE regulations, conversion of CGPA into equivalent percentage as follows:

viii. Equivalent Percentage = (CGPA – 0.50) x 10.

14. Award of Class

After a student has satisfied the requirements prescribed for the completion of the program and are eligible for the award of B.Tech. Degree, he/she shall be placed in one of the following:

Class Awarded	CGPA Secured
First Class with Distinction	≥ 7.5
First Class	≥ 6.5 < 7.5
Second Class	≥ 5.5 < 6.5
Pass Class	≥ 4.0 < 5.5

15. With-Holding the Result

If the candidate has any dues not paid to the institution or if any case of indiscipline or malpractice is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of awarding degree is liable to be withheld in such cases.

16. Transitory Regulations and Gap – Year

i. Discontinued, detained, or failed candidates are eligible for readmission as and when the semester is offered after fulfillment of academic regulations. Candidates who have been detained for attendance shortage or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered and they will be in the academic regulations into which they get readmitted.

ii. Gap Year – concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after I year/ II year/ III year to pursue entrepreneurship full time. This period shall be counted for the maximum time for graduation.

iii. An evaluation committee at university level shall be constituted to evaluate the proposal submitted by the student and the committee shall decide on permitting the student for availing the Gap Year.

iv. Candidates who were permitted with Gap Year shall be eligible for rejoining into the succeeding year of their B.Tech from the date of commencement of class work and they will be in the academic regulations into which the candidate is presently rejoining.

v.

17. Industrial Collaborations

i. Institution-Industry linkages refer to the interaction between firms and universities or public research centers with the goal of solving technical problems, working on R&D, innovation projects and gathering scientific as well as technological knowledge.

ii. The Departments are permitted to design any number of Industry oriented minor tracks as the respective BoS feels necessary. In this process the departments can plan to have industrial collaborations in designing the minor tracks and to develop the content and certificate programs.

18. Community Service Project

i. Community Service Project should be an integral part of the curriculum, as an alternative to the Internships, whenever there is an exigency when students cannot pursue their internships.

ii. Every student should put in a minimum of 144 hours for the Community Service Project during the summer vacation. Each class/section should be assigned with a mentor.

iii. Specific Departments could concentrate on their major areas of concern. For example, Dept. of Computer Science can take up activities related to Computer Literacy to different sections of people like - youth, women, house-wives, etc

iv. A log book has to be maintained by each of the student, where the activities undertaken/involved to be recorded. The log book has to be countersigned by the concerned mentor/faculty in-charge.

v. Evaluation to be done based on the active participation of the student and grade could be awarded by the mentor/faculty member. The final evaluation to be reflected in the grade memo of the student. The Community Service Project should be different from the regular programs of NSS/NCC/Green Corps/Red Ribbon Club, etc. Minor project report should be submitted by each student. An internal Viva shall also be conducted by a committee constituted by the principal of the college. Award of marks shall be made as per the guidelines of Internship.

vi. A group of students or even a single student could be assigned for a particular habitation or village or municipal ward, as far as possible, in the near vicinity of their place of stay, so as to enable them to commute from their residence and return back by evening or so.

vii. The Community Service Project is a twofold one – First, the student/s could conduct a survey of the habitation, if necessary, in terms of their own domain or subject area. Or it can even be a general survey, incorporating all the different areas. A common survey format could be designed. This should not be viewed as a duplication of work by the Village or Ward volunteers; rather, it could be another primary source of data.

viii. Secondly, the student/s could take up a social activity, concerning their domain or subject area. The different areas, could be like – Agriculture, Health, Marketing and Cooperation Animal Husbandry, Horticulture, Fisheries, Sericulture, Revenue and Survey, Natural Disaster

Management, Irrigation, Law & Order, Excise and Prohibition, Mines and Geology, Energy, Internet, Free Electricity, Drinking Water etc.,

19. Transfer Details

i. Student transfers shall be as per the guidelines issued by the Government of Andhra Pradesh from time to time.

20. Preservation of Records

i. The laboratory records, internal test papers and end examination answer booklets shall be preserved for minimum of 2 years from the date of completion of their degree in the institution.

21. Amendments to Regulations

The Academic Council of SITAMS (Autonomous) reserves the right to revise, amend or change the Regulations, Scheme of Examinations, and / or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., with the recommendations of the concerned Board(s) of Studies.

22. General

i. The academic regulations should be read as a whole for purpose of any interpretation. Malpractices rules- nature and punishments are appended.

ii. Where the words "he", "him", "his", occur in the regulations, they also include "she", "her", "hers", respectively.

23. Conduct and Discipline

i. Students shall conduct themselves within and outside the precincts of the Institute in a manner befitting the students of an Institute of National importance.

ii. As per the order of the Hon'ble Supreme Court of India, ragging in any form is banned: acts of ragging will be considered as gross indiscipline and will be severely dealt with.

iii. The following additional acts of omission and /or commission by the students within or outside the precincts of the college shall constitute gross violation of code of conduct and are liable to invoke disciplinary measures

a. Ragging
b. Lack of courtesy and decorum: indecent behaviour anywhere within or outside the campus.
c. Willful damages or stealthy removal of any property /belongings of the Institute / Hostel or of fellow students
d. Possession, consumption of distribution of alcoholic drinks or any kind of hallucinogenic drugs
e. Mutilation or unauthorized possession of library books
f. Hacking in computer systems
g. Furnishing false statements to the disciplinary committee, or willfully withholding information relevant to an enquiry
h. Organizing or participation in any activity that has potential for driving fellow students along lines of religion caste batch of admission hostel or any other unhealthy criterion.

i. Resorting to noisy and unseemly behavior, disturbing studies of students.
j. Physical or mental harassment of fresher through physical contact or oral abuse
k. Adoption of unfair means in the examination
l. Organizing or participating in any group activity except purely academic and scientific Programmers in company with others in or outside campus without prior permission of the Principal
m. Disturbing in drunken state or otherwise an incident in academic or students function or any other public event.
n. Not obeying traffic rules in campus not following safety practices or causing potential danger to oneself or other persons in any way.
o. Any other act or gross indiscipline

iv. Commensurate with the gravity of the offence the punishment may be reprimand fine and expulsion from the hostel debarment from an examination rustication for a specified period or even outright expulsion from the College.
v. The reprimanding Authority for an offence committed by students in the Hostel and in the Department or the classroom shall be respectively, the managers of the Hostels and the Head of the concerned Department
vi. In all the cases of offence committed by students in jurisdictions outside the purview the Principal shall be the Authority to reprimand them.
vii. All Major acts of indiscipline involving punishment other than mere reprimand shall be considered and decided by the Principal Students Disciplinary Committee appointed by the Principal.
viii. All other cases of Indiscipline of Students like adoption of unfair means in the examinations shall be reported to the Vice-Principal for taking appropriate action and deciding on the punishment to be levied.
ix. In all the cases of punishment levied on the students for any offence committed the aggrieved party shall have the right to appeal to the Principal who shall constitute appropriate Committees to review the case.

NATURE OF MALPRACTICES/ IMPROPER CONDUCT PUNISHMENT	PUNISHMENT
1.(a)possessesor keeps accessing examination hall, any paper, notebook, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory/practicalin which he/she is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination) Expulsion from the examination hall and cancellation of the performance in that subject only.	Expulsion from the examination hall and cancellation of the performance in that subject Only.
1. (b) Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons inside or outside the exam hall in respect of any matter. Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he/she will be handed over to the police and a case is registered against him/her.	Expulsion from the examinations hall and cancellation of the performance in that subject only of all the candidates involved in case of an outsider He / She will be handed over to the police and a case is registered against him/her.

2. Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examinations hall and cancellation of the performance in that subject and all other subjects the candidates has already appeared including practical examinations and projects work and shall not be permitted to appear for the reaming examinations of the subjects of that semester/Year. The Hall Ticket of the candidate will be cancelled and retained by the CE.
3. Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.

4. Smuggles in the answer book or additional sheet or takes out or arranges to send out the question paper or answer book or additional sheet, during or after the examination.	If the imposter is an outsider, he/she will be handed over to the police and a case is registered against him/her. Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5. Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6. Refuses to obey the orders of the Chief -Superintendent / Assistant- Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall or causes any injury to his person or to any of his relatives whether by offensive words spoken or written or by signs or by visible representation or assaults the officer-in- charge, or any person	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates are also debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

on duty inside or outside the examination hall or any of his relatives, or indulges in any other act of misconduct or mischief which results in damage to or destruction of property in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
7. Leaves the exam hall taking away answer script or intentionally tears off the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all the external examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8. Possesses any lethal weapon or fire arm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

9. Belongs to college, who is not a candidate for the particular examination or any person not connected with the college but indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the college will be expelled from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the college will be handed over to police and, a Police case will be registered against them.
10. Comes in a drunken state to the examination hall.	Expulsion from the examination hall and cancellation of the performance.
11. Copying is detected on the basis of internal evidence, such as, during valuation or during special scrutiny	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that Semester / year examinations.
12. If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Principal for further action to award suitable punishment.	

Note: Failing to read the regulation is not considered as an excuse

B.Tech R20 - COURSE STRUCTURE AND SYLLABI

Semester I (First Year)

S.No	Course Code	Course Title	Course Category	Scheme of Instructions Hours per Week				Scheme of Examination Maximum Marks		
				L	T	P/D	C	I	E	Total
1	20HSM111	Communicative English for Engineers	HSMC	3	0	0	3	30	70	100
2	20BSC111	Algebra and Calculus	BSC	2	1	0	3	30	70	100
3	20ESC111	Engineering Graphics	ESC	1	0	4	3	30	70	100
4	20ESC114	Basic Electrical and Electronics Engineering	ESC	2	1	0	3	30	70	100
5	20ESC115	Programming with Python	ESC	2	1	0	3	30	70	100
6	20HSM112	Communicative English Language Lab	HSMC	0	0	3	1.5	30	70	100
7	20ESC116	Basic Electrical and Electronics Engineering	ESC	0	0	3	1.5	30	70	100
8	20ESC118	Programming with Python Lab	ESC	0	0	3	1.5	30	70	100
Contact Hours per week				10	3	13	-	-	-	-
Total Hours per week				26			-	-	-	-
Total credits							19.5	-	-	-
Total Marks								240	560	800

Semester II (First Year)

S.No	Course Code	Course Title	Course Category	Scheme of Instructions Hours per Week				Scheme of Examination Maximum Marks		
				L	T	P/D	C	I	E	Total
1	20BSC121	Differential Equations and Transform Techniques	BSC	2	1	0	3	30	70	100
2	20BSC122	Engineering Chemistry	BSC	3	0	0	3	30	70	100
3	20BSC123	Engineering Physics	BSC	3	0	0	3	30	70	100
4	20MEC121	Engineering Mechanics	ESC	2	1	0	3	30	70	100
5	20MEC123	Basic Mechanical Engineering	ESC	3	0	0	3	30	70	100
6	20BSC114	Engineering Chemistry Lab	BSC	0	0	2	1	30	70	100
7	20BSC115	Engineering Physics Lab	BSC	0	0	2	1	30	70	100
8	20ESC112	Engineering Workshop & IT Workshop	ESC	0	0	2	1	30	70	100

9	20MEC124	Computer Aided Drafting Lab	ESC	0	0	3	1.5	30	70	100
10	20MAC121	Human Values and Ethics	MAC	2	0	0	0	P	-	-
Contact Hours per week				15	2	9	-	-	-	-
Total Hours per week						26	-	-	-	-
Total credits							19.5	-	-	-
Total Marks								240	560	800

Semester III (Second Year)

S.No	Course Code	Course Title	Course Category	Scheme of Instructions Hours per Week				Scheme of Examination Maximum Marks		
				L	T	P	C	I	E	Total
1	20BSC231	Numerical Methods and Probability theory	BSC	3	1	0	4	30	70	100
2	20ESC235	Strength of materials	ESC	2	1	0	3	30	70	100
3	20CIV231	Building Materials and construction	PCC	3	0	0	3	30	70	100
4	20CIV232	Fluid Mechanics and hydraulic machinery	PCC	2	1	0	3	30	70	100
5	20CIV233	Surveying	PCC	2	1	0	3	30	70	100
6	20CIV234	Building Planning using AUTOCAD	SOC	0	1	2	2	30	70	100
7	20ESC236	Strength of materials Lab	ESC	0	0	3	1.5	30	70	100
8	20CIV235	Fluid Mechanics Lab	PCC	0	0	3	1.5	30	70	100
9	20CIV236	Surveying Lab	PCC	0	0	3	1.5	30	70	100
Contact Hours per week				12	5	11	-	-	-	-
Total Hours per week						28	-	-	-	-
Total credits							22.5	-	-	-
Total Marks								270	630	900

Semester IV (Second Year)

S.No	Course Code	Course Title	Course Category	Scheme of Instructions Hours per Week				Scheme of Examination Maximum Marks		
				L	T	P	C	I	E	Total
1	20BSC242	Mathematical Modeling & Quantitative Techniques	BSC	2	1	-	3	30	70	100
2	20HSM241	Principles of Management	HSMC	3	0	-	3	30	70	100

3	20CIV241	Design of reinforced concrete structures	PCC	2	1	-	3	30	70	100
4	20CIV242	Geology for civil Engineering	PCC	3	0	-	3	30	70	100
5	20CIV243	Highway Engineering	PCC	2	1	-	3	30	70	100
6	20CIV244	Advanced Surveying	SOC	0	1	2	2	30	70	100
7	20CIV245	Engineering Geology Lab	PCC	0	0	3	1.5	30	70	100
8	20CIV246	Hydraulic Machinery Lab	PCC	0	0	3	1.5	30	70	100
9	20CIV247	Basic Civil Engineering lab	PCC	0	0	3	1.5	30	70	100
10	20MAC231	Environmental Science	MAC	2	0	0	0	P	-	-
Contact Hours per week				14	4	11	-	-	-	-
Total Hours per week				29			-	-	-	-
Total credits							21.5	-	-	-
Total Marks								270	630	900
1		**Honors / Minor Courses***	**HNR/MNR**	4	0	0	4	30	70	100

I B.Tech. – I Semester

20HSM111	**COMMUNICATIVE ENGLISH FOR ENGINEERS (Common to All Branches)**	**L T P C 3 0 0 3**

PRE-REQUISITES: Nil

EDUCATIONALOBJECTIVES:

1. To Provide Knowledge on developing Vocabulary and communicating in a verbal manner.
2. To understand in using of technology for societal aspects.
3. To recognize the importance on constructing Entrepreneurship Skills.
4. To Execute Contextual knowledge to recognize the need of ability to engage in independent and life-long learning in the broadest context of technological change.
5. To support and identify the earlier Medical Life Sciences used in India

UNITI: COMMUNICATION SKILLS FOR PROFESSIONALS (9)

Listening: Identifying the topic, specific pieces of information by listening by listening to short audio texts and answering a series of questions.
Speaking: Asking and answering general questions; introducing oneself and others.
Reading: Skimming to get the main idea of a text, scanning to look for specific information.
Reading for writing: Beginnings and endings of paragraphs
Grammar and Vocabulary: Articles and prepositions and word formation. Content words and function words.

UNITII: TECHNOLOGY WITH A HUMAN FACE A LECTURE BY E.F.SCHUMACHER (9)

Listening: Answering a series of questions about main idea and supporting ideas after listening to audio texts.
Speaking: Discussion in pairs/small groups on specific topics.
Reading:. Identifying sequence of ideas recognizing verbal techniques.
Writing: Paragraph writing (specific topics) using suitable cohesive devices;mecahanics of writings.
Grammar and Vocabulary: Word formation (Derivtion,Borrowing-coinage-compounding)
Tenses.

UNITIII: AZIM PREMJI-AN ENTREPRENEUR (9)

Listening: Identifying the topic, specific pieces of information by listening by listening to short audio texts.
Speaking: Discussing daily routine activities.
Reading: Phrasal verbs often used in daily conversations.
Writing: Beginnings and endings of paragraphs
Grammar and Vocabulary: Letter writing (official) - voice of verbs

UNIT IV: REFLECTIONS OF FUTURE THE YEAR –BY THEODORE J.GORDON (9)

Listening: Identifying the topic, specific pieces of information by listening by listening to short audio texts and answering a series of questions.
Speaking: Asking and answering general questions; introducing oneself and

others.
Reading: Skimming to get the main idea of a text, scanning to look for specific information.
Reading for writing: Beginnings and endings of paragraphs
Grammar and Vocabulary: Direct and Indirect speech-Email writing.

UNIT V: Y.SUBBA ROW (9)

Listening: Identifying the topic, specific pieces of information by listening by listening to short audio texts and answering a series of questions.
Speaking: Asking and answering general questions; introducing oneself and others.
Reading: Skimming to get the main idea of a text, scanning to look for specific information.
Reading for writing: Beginnings and endings of paragraphs introducing the topic summarizing the main idea and providing a transition to the next paragraph.
Grammar and Vocabulary: Subject verb agreement- Report writing**.**

COURSE OUTCOMES:

On successful completion of the course, student will be able to		**POs related to COs**
CO1	Understand the concepts on developing vocabulary and communicating in a verbal manner.	**PO1**
CO2	Understand and develop knowledge on the use of Technology for social aspects.	**PO5**
CO3	Understand Acquiring skills to become an able Entrepreneur	**PO2**
CO4	Understand contextual knowledge to recognize the need of ability to engage in independent and life-long learning in the broadest context of technological change.	**PO6**
CO5	Understand the importance of Medical advancement and its uses on Human life in India..	**PO4**

TEXT BOOKS:

1. V.N.Sudheer, S.RiyazAhammed, N.R Tulasi Prasad, N.Lakshmi Sailaja,"Functinal English 1" The Department of English of SITAMS ,1/e. 2016
2. V.N.Sudheer, S.RiyazAhammed, N.R Tulasi Prasad, N.Lakshmi Sailaja,"Functinal English 2" The Department of English of SITAMS ,1/e. 2016

REFERENCE BOOKS:

1. K.SrinivasaKrishna ,B.Kuberudu , "Business communication and softskills", ExcelBooks ,1/e 2008.
2. K.R. Lakshminarayana , "English for Technical communication" ,Scitech Publishers, 2/e, 2009
3. R.K. Bansal ,J.B. Harrison, "Spoken English", Orient Longman, Mumbai, 2/e,2009
4. Raymond Murphy ,Murphys English Grammar, Raymond Murphy Publishers , 2/e, 2006Cambridge English Dictionary for advanced Learners.
5. Inspiring Lives by Dr. JandhyalaRavindranath,Dr.M.Sarath Babu

REFERENCE BOOKS:

1. www.english club.com
2. www.easyworldofenglish.com
3. www.languageguide.org/english/
4. www.bbc.co.uk/learningenglish
5. www.eslpod.com/index.html
6. www.myenglishpages.com

CO-PO MAPPING

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	3	-	-	-	-	-	-	-
CO3	-	3	-	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	3	-	-	-	-	-	-
CO5	-	-	-	3	-	-	-	-	-	-	-	-
CO*	**3**	**3**	**-**	**3**	**3**	**3**	**-**	**-**	**-**	**-**	**-**	**-**

I B.Tech. – I Semester

		L	T	P	C
20BSC111	**ALGEBRA AND CALCULUS (Common to All Branches)**	**2**	**1**	**0**	**3**

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To familiarize the students with the theory of matrices.
2. To explain the series expansion using means value theorem and basic concepts of partial
   derivatives and its applications
3. To learn the methods of evaluation of double and triple integrals
4. To explain the concept of vector differentiation
5. To explain the concept of vector integration

UNIT I: MATRICES **(9)**

Rank - Echelon form and Normal form - Solution of linear system of homogeneous and non-homogeneous equations - Direct method: Gauss elimination method - Eigen values and Eigen vectors of a matrix and properties (without proofs) - Cayley-Hamilton theorem (without proof): Inverse and powers of a matrix. – Diagonalization of a matrix using similarity transformation only.

UNIT II: DIFFERENTIAL CALCULUS AND ITS APPLICATIONS **(9)**

Rolle's Theorem, Lagrange's Theorem(without proof) - Taylor's and Maclaurin's series for single variable (simple examples) - Functions of several variables - Jacobian – Taylor's and Maclaurin's series for two variables - Maxima and minima of functions of two variables - Lagrangian method of undetermined multipliers with three variables only.

UNIT III: MULTIPLE INTEGRALS **(9)**

Double and triple integrals: Evaluation of Double integrals (Cartesian and polar coordinates), Change of order of integration (Cartesian form only), Change of variables: double integration from Cartesian to polar coordinates, Evaluation of Triple integrals (Cartesian coordinates).

UNIT IV: VECTOR DIFFERENTIAL CALCULUS **(9)**

Introduction to Vector Differentiation, Scalar and Vector point functions - Gradient of a Scalar function, directional derivative, Divergence of a Vector function, Solenoidal vector, Curl of a Vector function, Irrotational vector, Laplacian operator.

UNIT V: VECTOR INTEGRAL CALCULUS **(9)**

Line Integral - Potential function - Surface and volume integrals - Green's, Stoke's and Gauss divergence theorem (without proofs) - Verification of Green's, Stoke's and Gauss divergence theorems.

TOTAL HOURS: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		POs related to COs
CO1	To solve system of homogenous and non-homogenous linear equations, find the Eigen values and Eigen vectors of a matrix and identify special properties of a matrix.	PO1,PO2,PO3
CO2	Illustrate series expansion of functions using mean value theorems, interpret partial derivatives as a function of several variables, Apply Jacobean concept to deal with the problems in change of variables, Evaluate maxima and minima of functions.	PO1,PO2,PO3
CO3	To evaluate double and triple integrals of functions of several variables	PO1,PO2,PO3
CO4	To illustrate the physical interpretation of gradient, divergence and curl and apply operator del to scalar and vector point functions.	PO1,PO2,PO3
CO5	To find line, surface, volume integrals and the work done in moving a particle along the path over a force field and apply Green's, Gauss divergence and Stokes theorem in evaluation of line, surface and volume integrals.	PO1,PO2,PO3

TEXT BOOKS:

1. T.K.V. Iyengar, B.Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad, "Engineering Mathematics–I", S. Chand and Company Ltd, New Delhi.
2. T.K.V. Iyengar, B.Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad ."Mathematical Methods", S. Chand and Company Ltd, New Delhi.
3. Dr. B. S. Grewa,"Higher Engineering Mathematics", Khanna Publishers, Delhi, , 44/e, 2017

REFERENCE BOOKS:

1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Publishers, New Delhi.
2. N.P.Bali ,"A Text Book of Engineering Mathematics", Laxmi publications (P)Ltd, Delhi.
3. Dr. M. K. Venkata Ramana ,"Higher Engineering Mathematics", National Pub, Madras
4. E.Rukmangadachari, E.Keshava Reddy, "Engineering Mathematics-I", Pearson Educations, Chennai.

REFERENCE WEBSITE:

1. https://nptel.ac.in/courses/110/105/111105111/
2. https://www.youtube.com/watch?v=8D3WViAyJvc
3. https://www.youtube.com/watch?v=fKzDtjq0ks4
4. https://www.youtube.com/watch?v=wMd4YRyBmjA
5. https://www.youtube.com/watch?v=ArkDa6d5h9I
6. https://www.youtube.com/watch?v=KgItZSst2sU
7. https://www.youtube.com/watch?v=-I3HUeHi1Ys
8. https://www.youtube.com/watch?v=SZCsFS9izfQ
9. https://www.youtube.com/watch?v=ma1QmE1SH3I

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	-	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	3	2	-	-	-	-	-	-	-	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	-
CO*	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

I B.Tech. – I Semester

20ESC111	ENGINEERING GRAPHICS	L	T	P/D	C
	(Common to all branches)	1	0	4	3

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To expose them to existing national standards related to technical drawings and develop knowledge of basic engineering curves.
2. To develop drawing skills for communication of concepts, ideas and design of projections of points, lines and planes.
3. To develop geometrical shapes and multiple views of projections of solids and sections of solids.
4. To develop drawing skills for communication of concepts, ideas and design the development of surfaces of objects and isometric views.
5. To develop geometrical shapes and multiple views of orthographic projections of solids and perspective views.

Importance of drawings in engineering applications - Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets - Lettering, numbering and dimensioning – Basic geometrical constructions – Scales.

UNIT – 1: ENGINEERING CURVES (9)

Engineering Curves: Conics **–** Construction of ellipse, parabola and hyperbola by eccentricity method and rectangular hyperbola **–** Construction of cycloid, epi cycloid and hypo cycloid **–** Involutes of square, circle, pentagon and hexagon **–** Drawing of tangents and normal to the above curves

UNIT – 2: PROJECTION OF POINTS, LINES AND PLANE SURFACES (12)

Projection of Points: Principles of orthographic projection **–** First angle and third angle projections **–** Projection of points. **Projection of Lines:** Projection of straight lines (only first angle projections) inclined to one and both the principal planes **–** Determination of true lengths, true inclinations by rotating line and trapezoidal method and traces. **Projection of Planes:** Planes (polygonal and circular surfaces) inclined to both the principal planes by change of position method.

UNIT – 3: PROJECTION OF SOLIDS AND SECTION OF SOLIDS (12)

Projection of Solids: Projection of simple solids like prisms, pyramids, cylinder and cone, when the axis is inclined to one principal plane. **Section of Solids:** Sectioning of right regular solids like prisms, pyramids, cylinder and cone, solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other plane **–** Obtaining true shape ofsection.

UNIT – 4: DEVELOPMENT OF SURFACES AND ISOMETRIC PROJECTIONS (12)

Development of Surfaces: Development of lateral surfaces of simple and sectioned solids like prisms, pyramids, cylinder and cone. **Isometric Projection:** Principles of isometric projection **–** Isometric scale **–** Isometric views of simple

solids and truncated solids like prisms, pyramids, cylinder and cone – Combination of two solid objects in simple vertical positions.

UNIT – 5: ORTHOGRAPHIC PROJECTIONS AND PERSPECTIVE PROJECTIONS (12)

Orthographic Projections: Visualization principles – Plane of projections – Representation of three dimensional objects – Layout of views – Sketching of multiple views from pictorial views of objects. **Perspective Projection:** Perspective projection of simple solids like prisms and pyramids by visual ray method.

Total Hours: 60

COURSE OUTCOMES:

On successful completion of the course, students will be able to		POS related to COS
CO1	Construct the Engineering curves and generate tangent and normal for those curves.	P01,P02,P03,P10
CO2	Draw the projection of points, lines and plane surfaces.	P01,P02,P03, P10
CO3	Draw the projection of solids, sections of solids like prisms, pyramids, cylinder and cone.	P01,P02,P03, P10
CO4	Draw the isometric projections and views and also develop the development of surfaces.	P01,P02,P03, P10
CO5	Draw the orthographic and perspective projections of solids.	P01,P02,P03, P10

TEXT BOOKS:

1. N.D. Bhatt and V. M. Panchal , "Engineering Drawing" , Charotar Publishing House, 50th edition,2010.
2. K.V.Natrajan , "A Text book of Engineering Graphics", Dhanalakshmi Publishers, Chenna,2009.

REFERENCES BOOKS:

1. Luzzader, Warren.J and Duff,John M, "Fundamentals of Engineering Drawing with an Introduction to Interactive Computer Graphics for Design and Production", Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
2. K.Venugopal and V.Prabhu Raja ,"Engineering Graphics", New Age International (P) Limited.
2008.
3. M.B.Shah and B.C.Rana , "Engineering Drawing", Pearson Education, 2/e, 2009.
4. Basant Agarwal and C.M.Agarwal ,"Engineering Drawing", Tata McGraw Hill Publishing Company Limited, NewDelhi, , 2008,

REFERENCE WEBSITE:

1. https://nptel.ac.in/courses/112/102/112102304/
2. https://nptel.ac.in/courses/112/105/112105294/
3. https://nptel.ac.in/courses/112/103/112103019/
4. https://nptel.ac.in/courses/112/104/112104172/

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	-	-	-	-	-	1	-	-
CO2	3	3	3	-	-	-	-	-	-	1	-	-
CO3	3	3	3	-	-	-	-	-	-	1	-	-
CO4	3	3	3	-	-	-	-	-	-	2	-	-
CO5	3	3	3	-	-	-	-	-	-	2	-	-
CO*	**3**	**2.8**	**2.8**	**-**	**-**	-	**-**	**-**	**-**	**1.4**	-	**-**

I B.Tech. – I Semester

20ESC114	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (Common to Civil and Mechanical branches)	L	T	P/D	C
		2	1	-	3

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To introduce electric circuits and its analysis using network theorems.
2. To impart knowledge on construction and operation of D.C. machines.
3. To learn construction and operation of A.C. machines and transformers.
4. To learn basic principles of all measuring instruments.
5. To demonstrate knowledge on overview of the principles, operation and application of basic electronic devices and Logic gates.

UNITI: INTRODUCTION TO ELECTRICAL ENGINEERING (9)

Ohm's Law –Basic circuit components–Kirchhoff's laws with simple problems – Types of sources, series, parallel circuits, star-delta Transformation–Network Theorems–Superposition and reciprocity –Thevenin's and Norton's Theorems and Maximum Power Transfer Theorem.

UNIT II: DC MACHINES (9)

Principle of operation of DC generators– Types of DC generators–EMF equation in DC generator– OCC of a DC shunt generator– Principle of operation of DC motors– Types of DC motors– Torque equation– Losses and efficiency calculation in DC motors– Swinburne's test and brake test–Speed control of DC shunt motor.

UNIT III: AC MACHINES (9)

Principles of operation of transformer–Constructional details–Losses and efficiency– Regulation of transformer– O.C and S.C tests– Principles of operation of three phase induction motor.

UNIT IV: MEASURING INSTRUMENTS (9)

Introduction–Classification of instruments–Operating principles– Essential features of measuring instruments– Moving coil and moving iron instruments– Dynamometer wattmeter and energy meter.

UNIT V: ANALOG AND DIGITAL ELECTRONICS (9)

The P-N junction diode–Volt-Ampere characteristics–Applications of diode–Zener diode- Volt-Ampere characteristics–Bipolar Junction Transistor (BJT) –Operation of NPN transistor –Input-Output characteristics of CE configuration–Logic gates and truth tables–NOT, OR, AND, EX-OR, EX-NOR, Universal Gates- NAND, NOR Gates–Boolean algebra and De Morgan's Theorems.

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		POs related toCos
CO1	Demonstrate knowledge on basic circuit components and basic concepts of electrical engineering, Analyze Circuits by different network reduction techniques	PO1, PO2
CO2	Demonstrate knowledge on Construction and performance of DC Motors and Analyze Losses and Efficiency of motors	PO1, PO2
CO3	Demonstrate knowledge on Construction and performance of AC motor and transformer and Analyze Losses and Efficiency of motors and transformer	PO1, PO2
CO4	To understand and evaluate the calibration of different electrical measuring instruments	PO1, PO2, PO3
CO5	To Acquire sound knowledge on internal structure of PN junction, all the electronic devices. and logic gates	PO1, PO2

TEXT BOOKS:

1. Basic Electrical Engineering-by M.S Naidu and S Kamakshaiah.
2. Basic Electrical Engineering by T.K.Nagasarkar and M.S Sukhija
3. Electronic Devices and Circuits, N.Salivahanan, and N.Suresh Kumar, TMH, 3rdEdition, 2012
4. Digital Design, 3/e, 2006, Morris Mano, Prentice Hall of India, New Delhi

REFERENCES BOOKS:

1. Theory and Problems of BEE by DP Kothari and IJ Nagrath.
2. Principle of Electrical Engineering by V.K Mehtha,S Chand Publications.
3. Introductory Circuit Analysis, R.L. Boylestad, Pearson,12th edition, 2013.

REFERENCE WEBSITE:

1. https://nptel.ac.in/courses/108/105/108105112/
2. https://nptel.ac.in/courses/108/101/108101091/

CO-PO MAPPING:

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO.1	3	2	-	-	-	-	-	-	-	-	-	-
CO.2	3	2	-	-	-	-	-	-	-	-	-	-
CO.3	3	2	-	-	-	-	-	-	-	-	-	-
CO.4	3	2	2	-	-	-	-	-	-	-	-	-
CO.5	3	2	-	-	-	-	-	-	-	-	-	-
CO*	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

I B.Tech. – II Semester

		L	T	P	C
20ESC115	**PROGRAMMING WITH PYTHON (Common to All Branches)**	**2**	**1**	**0**	**3**

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To impart the basics of python and its IDEs.
2. To understand the basic data structure in python.
3. To familiarize with python GUI and files.
4. To develop broad understanding of various object-oriented concepts in python.
5. To introduce the python libraries for solving real-time problems.

UNIT I: BASICS OF PYTHON (9)

Python programming language: About Python- Introduction to various IDEs- IDLE- PyCharm, Spyder- Sublime text- Jupyter Notebook.
Literals: Numeric literals - String literals- Variables and Identifiers: Variable assignment and keyboard input – Identifiers - keywords and other predefined identifiers.
Control Structures: Sequential control- Selection control- Iterative control statements.

UNIT II: LISTS, DICTIONARIES AND SETS (9)

Lists: List structures - Common list operations - List traversal - Lists in Python - Python list type –Tuples – sequences - Nested lists - Iterating over lists in python.
Dictionaries and Sets: Dictionary types in Python - Set data type- Strings and its operations.

UNIT III: FUNCTIONS AND TEXT FILES (9)

Functions: Function declaration- Category of Functions- Parameter Passing - Keyword Arguments in Python - Default Arguments in Python - Variable Scope, Lambda function.
Files: Fundamentals – opening, reading and writing text files, .csv and .xlsx files.

UNIT IV: OBJECT-ORIENTED CONCEPTS USED IN PYTHON (9)

Features of object-oriented programming-Fundamental concepts- Class- Encapsulation- Inheritance- Polymorphism. Object references - Turtle graphics - creating a Turtle Graphics Window - the "Default" Turtle - Fundamental Turtle Attributes and Behavior - Additional Turtle Attributes - Creating Multiple Turtles.

UNIT V: INTRODUCTION TO PYTHON LIBRARIES (9)

Python Libraries- Introduction to Libraries- Creating and Exploring Packages- Numpy, SciPy, matplotlib, Pandas, Scikit-learn- seaborn.

TOTAL HOURS: 45

COURSE OUTCOMES:

On successful completion of the course the student will be able to,		POs related to COs
CO1	Identify and apply the appropriate control statements for solving problems.	PO1, PO2, PO5
CO2	Demonstrate knowledge of basic data structures and functions.	PO1, PO3, PO4
CO3	Analyse and apply the appropriate file handling mechanism.	PO1, PO2, PO5
CO4	Identify and implement the suitable object-oriented concepts.	PO1, PO2, PO5
CO5	Evaluate the real-world problems using python packages.	PO1, PO4, PO5

TEXT BOOKS:

1. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem-Solving Focus", Wiley India Edition, 2016.
2. John V. Guttag., "Introduction to computation and programming using python: with applications to understanding data", PHI Publisher, 2016.
3. John Hunt, "A Beginners Guide to Python 3 Programming", Springer Publisheers, 2020.

REFERENCES:

1. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", SecondEdition,Shroff/O'ReillyPublishers,(http://greenteapress.com/wp/thinkpython/), 2016
2. Charles Severance, "Python for everybody: exploring data in Python 3", Creative Commons Attribution-Non Commercial Share Alike 3.0 Unported License, 2016.

REFERENCE WEBSITES:

1. https://onlinecourses.swayam2.ac.in/aic20_sp33
2. https://onlinecourses.nptel.ac.in/noc22_cs32
3. https://spoken-tutorial.org
3. https://www.w3schools.com/python.
4. https://www.geeksforgeeks.org.

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	2	-	-	-	-	-	-	-
CO2	3	-	3	2	-	-	-	-	-	-	-	-
CO3	3	3	-	-	2	-	-	-	-	-	-	-
CO4	3	3	-	-	2	-	-	-	-	-	-	-
CO5	3	-	-	2	2	-	-	-	-	-	-	-
CO*	**3**	**2**	**3**	**2**	**2**	**-**	-	-	-	-	-	-

I B.Tech. – II Semester

20HSM112	**COMMUNICATIVE ENGLISH LANGUAGE LAB (Common to All Branches)**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**1.5**

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

1. To provide Knowledge on developing Soft Skills and its techniques.
2. To understand Knowledge on the use of technology for giving Presentations.
3. Toapply gained informationin Preparing Resume.
4. Toanalyze theuse of body language while participating in Group Discussions.
5. To execute the complete knowledge on facing Job Interviews.

LIST OF TOPICS:

1. Introduction and importance of Soft Skills
2. Attributes of Soft Skills
3. Categories of Soft Skills- (Social, Thinking, Negotiating)
4. Exhibiting, Identifying, and Improving your Soft Skills
4. Acquiring Soft Skills (Train yourself)
5. Soft Skills practicing tips
6. Power Point presentation on Scientific/Technical Topics.
7. Designing a Resume
8. Resume Styles
9. Preparing Model Resumes
10. Group Discussion
11. Group Discussion strategies
12. Mock GDs.
13. Job Interviews
14. Interview Techniques
15. Model Interview questions – Mock Interview

COURSE OUTCOMES:

On successful completion of the course the student will be able to,		**POs related to COs**
CO1	Remembering the concepts on developing Soft Skills and its techniques. (Topics from 1 to 5)	**PO1**
CO2	Understand and Develop Knowledge on the use of technology in giving presentations. (Topic No:6)	**PO5**
CO3	Apply one's skills in Preparing a Resume before applying for a job.(Topic 7 to 9)	**PO6**
CO4	Analyze and executebody language while participating in Group Discussions. (Topics 10 to 12)	**PO2**
CO5	Evaluate by weighing one's communicative skills in facing Job Interviews through Mock Interviews. (Topics 13 to 15)	**PO10**

SOFT WARE SUGGESTED: Walden –Hyderabad.

REFERENCES:

1. Dr.K.Alex,"Soft Skills- Know yourself and know the world", S. Chand Publications, New Delhi, 2010
2. T.Vijayakumar, K.DurgaBhavani,English in Action 1st Edition, 2019, Mac millan Publications, Guntur.
3. Rout ledge, "Bailey Stephen Academic Writing – A Hand book for international students", 2014.
4. Chase, Becky Tarver," Pathways: Listening, Speaking and Critical Thinking. Heinley ELT", 2e/ 2018.
5. Hewings, Martin, "Cambridge Academic English (B2)". CUP, 2012

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-		-	-	-	-	-	-	-	-	-
CO2	-	-		-	3	-	-	-	-	-	-	-
CO3	-	-	-	-	-	3	-	-	-	-	-	-
CO4	-	3	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	-
CO*	**3**	**3**	**-**	**-**	**3**	**3**	**-**	**-**	**-**	**3**	**-**	**-**

SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)
DEPARTMENT OF CIVIL ENGINEERING

I B.TECH. – I SEMESTER

		L	T	P/D	C
20ESC116	**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB (COMMON TO CIVIL AND MECHANICAL BRANCHES)**	**-**	**-**	**3**	**1.5**

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To gain practical experience on fundamental electric laws.
2. To gain practical experience on verification of theorems.
3. To evaluate the performance characteristics ofDC and AC Machines
4. To gain practical experience on basic electronic devices and Circuits
5. To gain practical experience on different logic gates

LIST OF EXERCISES (Any Ten):

1. Verification of KCL and KVL
2. Verification of Superposition Theorem.
3. Verification of Thevinins Theorem.
4. Verification of Maximum Power Transfer Theorm.
5. Magnetization Characteristics of D.C Shunt Generator & determination of Critical Resistance.
6. Load Test on Three Phase Squirrel Cage Induction Motor.
7. Swinburne's Test of DC Shunt Machine.
8. Speed Control of DC Shunt Motor.
9. Brake Test on DC Shunt Motor. Determination of Performance Characteristics.
10. OC & SC Tests on Single- Phase Transformer to Find the Efficiency.
11. Volt-Ampere Characteristics of P-N Junction Diode and Zener Diode
12. Verification of Basic Logic gates- AND, OR, NOT.

COURSE OUTCOMES:

On the successful completion of this course, the student should be able to,		**POs related to COs**
CO1	Understand the fundamental electrical laws in engineering applications.	**PO1**
CO2	Verify different network theorems and digital circuits practically.	**PO2**
CO3	Design electrical circuits for measuring complicated electrical parameters.	**PO3**
CO4	Investigate DC and AC Machines like Induction Motor for solving complex problems.	**PO4**
CO5	Follow the ethical principles in implementing the experiments.	**PO8**
CO6	Do experiments effectively as an individual and as a team member in a group.	**PO9**
CO7	Communicate verbally and in written form, the understanding about the experiments.	**PO10**
CO8	Continue updating their skills related to Electronic circuits	**PO12**

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO.1	3	-	-	-	-	-	-	-	-	-	-	-
CO.2	-	3	-	-	-	-	-	-	-	-	-	-
CO.3	-	-	3	-	-	-	-	-	-	-	-	-
CO.4	-	-	-	3	-	-	-	-	-	-	-	-
CO.5	-	-	-	-	-	-	-	3	-	-	-	
CO.6	-	-	-	-	-	-	-	-	3	-	-	-
CO.7	-	-	-	-	-	-	-	-	-	3	-	-
CO.8	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**-**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**3**

I B.Tech. – I Semester

20ESC118	PROGRAMMING WITH PYTHON LAB (Common to All Branches)	L	T	P	C
		0	0	3	1.5

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

1: To understand the basic IDEs in python.
2: To gain expertise for problem solving using control structures in python
3: To develop the python programs using functions.
4: To solve various engineering problems using different data structures.
5: To gain knowledge on python libraries.

RECOMMENDED SYSTEMS/SOFTWARE REQUIREMENTS:

- For Windows: IDLE/ Spyder python development environment.
- For Linux: Default python version installed/ higher version.

LIST OF TASKS:

TASK-1: BASICS

a) Develop a simple python scripts to illustrate numeric literals and string literals.
b) Write a Python Program to Convert Kilometres to Miles.

TASK-2: LOOPS

a) Write a python Program to Make a Simple Calculator
b) Write a python program that reads a rating from the user and indicates whether the performance was unacceptable, acceptable or meritorious. The amount of the employee's raise should also be reported. Your program should display an appropriate error message if an invalid rating is entered. (The amount of an employee's raise is $2400.00 multiplied by their rating).

Rating	Meaning
0.0	Unacceptable performance
0.4	Acceptable performance
0.6 or more	Meritorious performance

TASK-3: LOOPS

a) Write a program containing a pair of nested while loop that displays the integer values 1–100. Ten numbers per row - with the columns aligned as shown below

```
 1  2  3  4  5  6  7  8  9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
                .
                .
91 92 93 94 95 96 97 98 99 100
```

b) Display the integer values 1–100 as given in question 3a) using only *one* while loop.

TASK-4: DICTIONARIES

a) Write a Python script to generate all the possible spellings of the last four digits of any given phone number – use Dictionaries.

TASK-5: STRINGS

a) Write a program to figure out if the register number format is correct or not using a Python code. (Hint: sample register number format- 20751A0500). Use string methods to solve the above problem.

TASK-6: FUNCTIONS

a) Write a function that generates a random password. The password should have a random length of between 7 and 10 characters. Each character should be randomly selected from positions 33 to 126 in the ASCII table. Your function will not take any parameters. It will return the randomly generated password as its only result. Display the randomly generated password in your file's main program. Your main program should only run when your solution has not been imported into another file.

TASK-7: PATTERN PRINTING

a) Write a python program to print half pyramid pattern with star (asterisk)

```
*
* *
* * *
* * * *
* * * * *
```

b) Write a python program to print the characters/alphabets in right-angled triangle pattern.

```
A
B C
D E F
G H IJ
K L M N O
P Q RS T U
V W X YZ
```

TASK-8: TURTLE

a) Write a python program to draw the basic shapes using turtle (Hint: Square, circle, triangle).

TASK-9: FILES

a) Write a python script to create a simple text file. Write the contents into the created file and read the contents from the file and display the same on to the console screen.
b) Write a python script to Create and write on excel file using xlsxwriter module.
c) Write a python script to write the contents into a csv file.

TASK 10: FILE HANDLING

Write a python program to perform the following tasks:

a) Copy the contents of one file into another file.
b) Count number of lines in a file.
c) Count number of characters in a file.

d) Count number of words in a file.

TASK 11: INHERITANCE

a) Write a python program to illustrate the inheritance concept.

TASK-12: MATH LIBRARIES

a) Write a python program to calculate area of a circle. Use the pi constant in the math module in your calculations. (Area of the circle $= \pi r^2$)

b) Write a python program to calculate Volume of a sphere. Use the pi constant in the math module in your calculations. (Volume of a sphere $= \frac{4}{3}\pi r^3$).

TASK-13: PANDAS

a) Write a Pandas program to create a line plot of the historical stock prices of a company between two specific dates.

TASK-14: PANDAS

a) Write a Pandas program to create a bar plot of the trading volume of a company stock between two specific dates.

COURSE OUTCOMES:

On successful completion of this course the students should be able to:		POs related to COs
CO1	Learn various problem solving approaches and ability to identify an appropriate approach to solve the problem	PO1, PO2, PO3, PO5
CO2	Implement conditionals and loops to design the python programming	PO1, PO2, PO3, PO5
CO3	Implement lists, set, tuples and dictionaries to develop python program.	PO1, PO2, PO3, PO5
CO4	Able to modulate the given problem using structural approach of programming	PO1, PO2, PO3, PO5
CO5	Build Python Programs using packages to solve real-time problems.	PO1, PO2, PO3, PO4,PO5
CO6	Follow the ethical principles in implementing the programs	PO8
CO7	Do experiments effectively as an individual and as a team member in a group.	PO9
CO8	Communicate verbally and in written form, the understanding about the experiments.	PO10
CO9	Continue updating their skill related to lists, tuples and dictionaries implementing programs in future.	PO12

REFERENCE BOOKS:

1. John V. Guttag., "Introduction to computation and programming using python: with applications to understanding data", PHI Publisher, 2016.
2. Charles Dierbach, "Introduction to Computer Science using Python: A Computational Problem-Solving Focus", Wiley India Edition, 2016.
3. John Hunt, "A Beginners Guide to Python 3 Programming", Springer

Publisheers, 2020.

REFERENCE WEBSITES:

1. https://onlinecourses.swayam2.ac.in/aic20_sp33
2. https://onlinecourses.nptel.ac.in/noc22_cs32
3. https://spoken-tutorial.org
4. https://www.w3schools.com/python.
5. https://www.geeksforgeeks.org.

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO.1	3	3	3	-	2	-	-	-	-	-	-	-
CO.2	3	3	3	-	2	-	-	-	-	-	-	-
CO.3	3	3	3	-	2	-	-	-	-	-	-	-
CO.4	3	3	3	-	2	-	-	-	-	-	-	-
CO.5	3	3	3	3	2	-	-	-	-	-	-	-
CO.6	-	-	-	-	-	-	-	3	-	-	-	-
CO.7	-	-	-	-	-	-	-	-	3	-	-	-
CO.8	-	-	-	-	-	-	-	-	-	3	-	-
CO.9	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**3**	**3**	**2**	**-**	**-**	**3**	**3**	**3**	**-**	**3**

I B.Tech. – II Semester

		L	T	P	C
20BSC121	DIFFERENTIAL EQUATIONS AND TRANSFORMATION TECHNIQUES (COMMON TO ALL BRANCHES)	2	1	0	3

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

1. To learn partial differential equations and how they can serve as models for physical processes and master the technique of separation of variables to solve partial differential equation
2. To learn the concepts of Laplace Transforms and inverse Laplace Transforms and to explore the solving initial value problems by using Laplace transform method.
3. To develop skill to design Sine and Cosine waves with the help of Fourier series.
4. To learn the concepts of Fourier transform and inverse Fourier Transform.

UNIT I: ORDINARY DIFFERENTIAL EQUATIONS (9)

Differential Equations of First Order and First Degree: Formation – Linear and Bernoulli's equations – Applications to L-R and C-R circuit's problems.

Linear Differential Equations of Higher Order: Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, Sin ax, Cos ax, polynomials in x, e^{ax} v(x) &x^m v(x) - Method of variation of parameters.

UNIT II: PARTIAL DIFFERENTIAL EQUATIONS (9)

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Solution of first order linear (Lagrange's) equation and Non-Linear (standard forms) equations - Solution of PDE by the Method of separation of variables.

UNIT III: LAPLACE TRANSFORMS (9)

Definition of Laplace transform, Laplace transform of standard functions - Laplace Transform ofUnit step function, Dirac's delta function and Periodic function – Properties of Laplace Transforms(without proof): Linear property, First shifting theorem, Change of Scale Property, Second shifting theorem, Multiplication & Division by t, Transform of Derivatives & Integrals - Inverse transform - Convolution theorem(without proof) – Application: Solution of ordinary differential equations of first and second order with constant coefficients.

UNIT IV: FOURIER SERIES (9)

Determination of Fourier coefficients, Euler's formulae, Dirichlet's conditions - Fourier series of periodic functions, even and odd functions - Fourier series in an arbitrary interval - Half-range Fourier sine and cosine expansions.

UNIT V: FOURIER TRANSFORM (9)

Fourier integral theorem (without proof) - Fourier sine and cosine integrals - Fourier transform –
Fourier sine and cosine transforms - Properties - Inverse transforms - Finite Fourier transforms.

TOTAL HOURS: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		POs related to COs
CO1	To identify whether the given differential equation of first order is linear or Bernoulli and to solve the higher order linear differential equations with constant coefficients.	PO1,PO2,PO3
CO2	Apply a range of techniques to find solutions of standard PDE's and outline the basic properties of standard PDE's	PO1,PO2,PO3
CO3	To understand the concepts of Laplace transform and elementary functions, general functions using its properties and special functions.	PO1,PO2,PO3
CO4	To understand finding Fourier series expression of the given function.	PO1,PO2,PO3
CO5	Understand Fourier transforms and properties of Fourier transforms	PO1,PO2,PO3

TEXT BOOKS:

1. K.V. Iyengar, B.Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad,"Engineering Mathematics–I", T, S. Chand and Company Ltd, New Delhi.
2. T.K.V. Iyengar, B.Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad,"Mathematical Methods", S. Chand and Company Ltd, New Delhi.
3. Dr. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publishers, Delhi, 44/e, 2017.

REFERENCE BOOKS:

1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw Hill Publishers, New Delhi.
2. Dr. M. K. Venkata Ramana, "Higher Engineering Mathematics", National Pub & Co, Madras.
3. N.P.Bali , "A Text Book of Engineering Mathematics", Laxmi publications (P)Ltd, New Delhi.
4. E.Rukmangadachari, E.Keshava Reddy, "Engineering Mathematics-II", Pearson Educations, Chennai.

REFERENCE WEBSITE:

1. https://nptel.ac.in/courses/111/106/111106100/
2. https://www.youtube.com/watch?v=OBhZvyhc8JQ&t=982s
3. https://nptel.ac.in/courses/111/106/111106100/
4. https://www.youtube.com/watch?v=3zCdNO2xp3s
5. https://www.youtube.com/watch?v=XU5hUrh6-18&t=948s
6. https://nptel.ac.in/courses/111/106/111106139/
7. https://www.youtube.com/watch?v=LGxE_yZYigI
8. https://www.youtube.com/watch?v=6spPyJH6dkQ
9. https://www.youtube.com/watch?v=GFKggEkKtLM

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	-	-	-	-	-	-	-	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-
CO3	3	3	2	-	-	-	-	-	-	-	-	-
CO4	3	3	2	-	-	-	-	-	-	-	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	-
CO*	**3**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

I B.Tech. – II Semester

20BSC122	**ENGINEERING CHEMISTRY**	**L**	**T**	**P**	**C**
	(Common to Civil and Mechanical Branches)	**3**	**0**	**0**	**3**

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

1. To learn different purification methods and analyze the impurities present in water.
2. To develop skill to describe the mechanism and control of corrosion.
3. To train the students on the fundamentals and applications of polymers.
4. To understand and apply the concepts of electrochemistry effectively.
5. To introduce basic principles of spectroscopy and chromatography

UNIT I: WATER AND WATER FOR INDUSTRIAL PURPOSE (9)

Water: Sources of water - Types of Impurities in Water - Hardness of water - Temporary and permanent hardness - Estimation of hardness by EDTA Method and numerical problems - Analysis of water - Dissolved oxygen - Disadvantages of hard water - Methods of treatment of water for domestic purpose - Sterilization - Chlorination,Ozonisation. **Water for Industrial Purpose:** Water for steam making - Boiler troubles - Priming and foaming, Boiler corrosion, Scales and sludge, Caustic embrittlement - Water treatment - Internal treatment - Colloidal,Phosphate, Calgon, Carbonate and Sodium aluminate conditioning of water - External treatment - Ion - exchange process - Demineralization of brackish water – Reverse osmosis

UNITII: SCIENCE OF CORROSION (9)

Definition - Types of corrosion - Dry corrosion (Direct chemical attack) - Wet corrosion - Theories of corrosion and mechanism - Electro chemical theory of corrosion - Galvanic corrosion - Concentration cell corrosion - Oxygen absorption type - Factors influencing the corrosion - Control of corrosion - Cathodic protection - Sacrificial anode and impressed current cathodic protection method.

UNITIII: POLYMERS (9)

Polymerization reactions - Basic concepts - Types of polymerizations - Addition polymerization with mechanism - condensation polymerization - Plastics - Thermosetting and thermoplastics - Composition, Properties and Engineering applications of teflon, bakelite, nylon and rubber - Processing of natural rubber and compounding. Elastomers: Buna S - Buna N - Polyurethane Rubber and Silicone Rubber.

UNIT - IV: PHASE RULE, STRUCTURAL MATERIALS AND REFRACTORIES (9)

Phase Rule: Definition – Terms involved in phase rule – Phase rule equation – Phase diagrams – One component system (water system) – Two component system (lead- silver system). Structural Materials: Cement – Composition of Portland cement – Analysis – Setting and hardening of cement (reactions) and manufacture of Portland cement. Refractories: Definition – Classification with examples – Criteria of a good refractory material – Causes for the failure of refractory materials.

UNITV: FUELS AND LUBRICANTS (9)

Fuels: Definition and classification of fuels – Liquid fuels – Classification of petroleum, refining of petroleum – Synthetic petrol – Bergius Process-Gaseous fuels-natural gas, produce gas, water gas, coal gas and bio gas. Lubricants: Principles and functions of lubricants – Properties of lubricants – Viscosity – Flash

and fire points – Cloud and pour points – Aniline point – Neutralization number.

TOTAL HOURS: 45

COURSE OUTCOMES:

On successful completion of the course the will be able to,		POs related to Cos
CO1	To understand the fundamentals of water technology and develop analytical skills in determining the hardness of water and to acquire awareness to societal issues on quality of water.	**PO1, PO2,PO3, PO6**
CO2	Acquire the knowledge in corrosion phenomenon and develop skills in the design of methods for control of corrosion	**PO1, PO2,PO3**
CO3	Acquire knowledge on polymeric materials and to prepare polymeric material for environmental safety and society need.	**PO1, PO3,PO6, PO7**
CO4	Analyze the effect of cement materials, causes for the failure of refractory materials and understanding of phase rule	**PO1, PO2**
CO5	Apply the basic knowledge of fuel chemistry and lubricants to identify the quality of fuels and lubricants.	**PO1, PO2**

TEXT BOOKS:

1. Prof. K. N. Jayaveera, Dr. G. V. Subba Reddy and Dr. C. Ramachandraiah, "Chemistry for Engineers", Tata McGraw Hill Publishers, New Delhi, 4/e, 2009.
2. Jain and Jain, "Text book of Engineering Chemistry", Dhanpat Rai Publishing Company, New Delhi.15/e, 2008
3. Text book of Engineering Chemistry, 18/e, 2008, S. S. Dara, S. Chand & Co, New Delhi.

REFERENCE BOOKS:

1. Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra, ScitechPublications(India) Pvt. Ltd, Hyderabad,"Engineering Chemistry, 5/e, 2009.
2. B.Viswanath, M. AuliceScibioh, "Fuel Cells Principles and Applications", Universities press, Hyderabad, 4/e, 2008.
3. Skoog and West, "Principles of Instrumental analysis",6/e Thomson,2007.
4. Glasston& Lewis, Dhanptharai Publishers, Physical Chemistry, New Delhi ,12/e, 2009.
5. JC Kuriacose and J. Rajaram ,"Engineering Chemistry (Vol.1&2)", Tata McGraw Hill Publishers, New Delhi, 5/e, 2004, ,

REFERENCE WEBSITE:

1.https://www.youtube.com/watch?v=zVZ9c6EXfTA
2.https://nptel.ac.in/courses/113/104/113104082/
3.https://nptel.ac.in/courses/104/105/104105039/
4.https://nptel.ac.in/courses/104/106/104106132/
5.https://www.digimat.in/nptel/courses/video/103108100/L01.html

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO.1	2	2	2	-	-	2	-	2	-	-	-	-
CO.2	2	2	2	-	-	-	-	2	-	-	-	-
CO.3	2	-	2	-	-	2	2	2	-	-	-	-
CO.4	2	2	-	-	-	-	-	2	-	-	-	-
CO.5	2	2	-	-	-	-	-	2	-	-	-	-
CO*	**2**	**2**	**2**	**-**	**-**	**2**	**2**	**2**	**-**	**-**	**-**	**-**

I B.Tech. – II Semester

20BSC123	ENGINEERING PHYSICS (Common to Civil and Mechanical Branches)	L	T	P	C
		3	0	0	3

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To enlighten the periodic arrangement of atoms in crystals, Bragg's law and to provide fundamentals related to structural analysis through powder diffraction method.
2. To identify the importance of the optical phenomenon i.e. interference and diffraction related to its Engineering applications.
3. To understand the mechanisms of Lasers and the propagation of light wave through optical fibres along with engineering applications
4. To acquire the knowledge in dielectric, magnetic materials and nano materials and their applications in different fields of Engineering
5. To familiarize the concepts of theoretical acoustics to practical use in engineering field. To explain the significance of ultrasound and its application in NDT for diversified engineering application.

UNITI: CRYSTALLOGRAPHYANDX-RAYDIFFRACTION (9)

Crystallography: Space lattice, Basis, unit cell and lattice parameters – Bravais Lattice –Crystal systems – Packing fraction – Coordination number – Packing fraction of SC, BCC &FCC .**X-Ray Diffraction:** Bragg's law – Bragg's X-ray diffractometer – Crystal structure determination by Powder method.

UNITII: WAVE OPTICS (9)

Interference: Interference – Principle of superposition – Interference of light – Conditions for sustained interference – Interference in thin films (Reflection Geometry) – Colors in thin films – Newton's Rings – Determination of wavelength and refractive index.

Diffraction: Diffraction – Introduction – Fresnel and Fraunhofer diffraction – Fraunhofer diffraction due to single slit.

UNITIII: LASERS AND FIBER OPTICS (9)

Lasers: Introduction – Characteristics of laser – Spontaneous and Stimulated emission of radiation – Einstein's coefficients – Population inversion – Lasing action – Pumping mechanisms – Nd-YAG laser – He-Ne laser – Applications of lasers.

Fiber Optics: Introduction – Principle of optical fiber – Acceptance Angle – Numerical Aperture – Classification of optical fibers based on refractive index profile and modes – Propagation of electromagnetic wave through optical fibers – Propagation Losses (Qualitative) – Applications.

UNIT IV: ENGINEERINGMATERIALS (9)

Dielectric Materials: Introduction – Dielectric polarization – Dielectric polarizability, Susceptibility and Dielectric constant – Types of polarizations: Electronic, Ionic and Orientation polarization (Qualitative) – Lorentz internal field – Clausius-Mossotti equation. **Magnetic Materials:** Introduction – Magnetic dipole moment – Magnetization – Magnetic susceptibility and permeability – Origin of permanent magnetic moment – Classification of magnetic materials: Dia, para & Ferro – Domain concept of Ferromagnetism (Qualitative) – Hysteresis

– Soft and Hard magnetic materials. **Nanomaterials:** Introduction – Surface area and quantum confinement – Physical properties: electrical and magnetic properties – Synthesis of nanomaterials – Top-down – Ball Milling – Bottom-up – Chemical Vapour Deposition – Applications of nanomaterials.

UNIT V: ACOUSTICS ANDULTRASONIC (10)

Acoustics: Introduction – Requirements of acoustically good hall – Reverberation – Reverberation time – Sabine's formula (Derivation using growth and decay method) – Absorption coefficient and its determination – Factors affecting acoustics of buildings and their remedies. **Ultrasonics:** Introduction – Properties – Production by piezoelectric methods – Detection – Non-Destructive Testing – Pulse echo system through transmission and reflection modes – Applications.

TOTAL HOURS: 45

COURSE OUTCOME:

On successful completion of the course the students will be able to		POs related to COs
CO1	Enlighten the periodic arrangement of atoms in crystals, Bragg'slaw and to provide fundamentals related to structural analysis through powder diffraction method	PO1, PO2
CO2	Identify the importance of the optical phenomenon i.e. interference and diffraction related to its Engineering applications.	PO1,PO2
CO3	Understand the mechanisms of Lasers and the propagation of light wave through optical fibres along with engineering applications	PO1, PO2
CO4	Acquire the knowledge in dielectric, magnetic materials and nano-materials and their applications in different fields of Engineering	PO1,PO2,PO12
CO5	Familiarize the concepts of theoretical acoustics to practical use in engineering field. To explain the significance of ultrasound and its application in NDT for diversified engineering application.	PO1,PO2

TEXT BOOKS:

1. Palanisamy ,"Engineering Physics", Palanisamy, Scitech Publications
2. K.Thyagarajan ,"Engineering Physics", McGraw Hill Publications
3. Maninaidu,"Engineering Physics", Pearson Publications

REFERENCE BOOKS:

1. Kittel ,"Solid State Physics", Wiley Publications
2. Gaur and Gupta , "Engineering Physics", Dhanpatrai Publications

REFERENCE WEBSITE:

1. https://www.youtube.com/watch?v=PEXSH8dB-Uk
2. https://www.youtube.com/watch?v=YvrwVK9ZqQY
3. https://www.digimat.in/nptel/courses/video/115107095/L01.html
4. https://www.youtube.com/watch?v=6QUFuZpCgGw

5. https://www.youtube.com/watch?v=etjZmdmrjSU
6. https://nptel.ac.in/courses/115/105/115105122/
7. https://nptel.ac.in/courses/108/108/108108122/
8. https://nptel.ac.in/courses/118/104/118104008/

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	2
CO5	3	2	-	-	-	-	-	-	-	-	-	-
CO*	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**

I B.Tech. – II Semester

20MEC121	ENGINEERING MECHANICS	L	T	P/D	C
	(Common to Civil and Mechanical branches)	2	1	-	3

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To apply the various methods to determine the resultant forces and its equilibrium acting on a particle in two and three dimensional.
2. To analyze the bodies subjected to friction, simple frames and apply.
3. To apply the concepts of locating centroids/center of gravity of various sections and to find out area moments of inertia for the sections.
4. To analyze the kinematics of a body undergoing rectilinear, curvilinear motion.
5. To apply the Dynamic equilibrium principles and work energy equations to solve appropriate problems.

UNIT I: STATICS OF PARTICLES (9)

Statics of Particles: Laws of mechanics – Parallelogram, triangular and polygon law of forces – Lame's theorem – Force and its characteristics – Resultant of coplanar forces – Equilibrium of a particle (plane) – Equilibrium of a particle in space – Equivalent forces – Principle of transmissibility. **Equilibrium of Rigid Bodies:**Law's of equilibrium – Free body diagram – Action and reaction forces – Moments and couples – Moment of a force about a point and axis – Varignon's theorem (all particles only analytical method).

UNIT II: ANALYSIS OF FRAMES, VIRTUAL WORK AND FRICTION (9)

Perfect Frames: Simple trusses – Analysis of trusses by method of joints and sections (analytical method only) – Simple frames. **Virtual Work:** Principle of virtual work – Applying the virtual work in mechanical efficiency of real machines. **Friction:** Laws of friction – Co-efficient of friction – Angles of friction – Angle repose – Friction on horizontal and inclined plane – Friction on ladder and wedges.

UNIT III: DISTRIBUTED FORCES (9)

Centre of Gravity: Centroid and centre of gravity – First moments of areas and lines – Centroids of simple and composite sections by method of moments – Centers of gravity and centroids of volumes – Theorems of Pappus-Guldinus. **Moment of Inertia:** Second moment of inertia of an area – Parallel and perpendicular axis theorem – Radius of gyration – Moments of inertia of simple and composite areas – Polar moment of inertia – Product of inertia – Principal axes and principal moments.

UNIT IV: KINEMATICS (9)

Kinematics of Particles: Equations of motion – Position, velocity and acceleration – Constant and variable acceleration – Rectilinear and curvilinear motion – Motion under gravity – Projectile motion – Rectangular, tangential and normal components of velocity and acceleration – Radius of curvature. **Kinematics of Rigid Bodies:** Translation and rotation about a fixed axis – General plane motion in velocity and acceleration.

UNIT V: KINETICS (9)

Kinetics of Particles: Newton's laws of motion and gravitation – Dynamic

equilibrium (D'alembret's principle). – Motion on rough and inclined surfaces – Motion of two bodies connected by strings – Linear and angular momentum of a particle – Principle of work and energy – Power and efficiency – Principle of conservation of energy – Principle of impulse and momentum – Impacts.

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		POs related to COs
CO1	Demonstrated and applied the knowledge of the various methods to determine the resultant forces and its equilibrium acting on a particle in two and three dimensional.	**PO1, PO2, PO3, PO4**
CO2	Analyze the bodies subjected to friction, simple frames and apply principle of virtual work to find reactions.	**PO1, PO2, PO3, PO4**
CO3	Find the location of centroid, center of gravity and moment of inertia for the given appropriate sections.	**PO1, PO2, PO3, PO4**
CO4	Analyze the kinematics of a body undergoing rectilinear, curvilinear motion.	**PO1, PO2, PO3, PO4**
CO5	Apply the dynamic equilibrium principles and work energy equations to solve appropriate problems.	**PO1, PO2, PO3, PO4**

TEXT BOOKS:

1. Ferdinand P. Beer, E. Russell Johnston, David Mazurek, Phillip J. Cornwell, Brian Self, Sanjeev Sanghi ,"Vector Mechanics for Engineers" , Tata McGraw-Hill Education Pvt., Ltd.,12/e, 2019,
2. J. L. Meriam, L. G. Kraige and J. N. Bolton, Engineering Mechanics: Statics, SI Version, & Engineering Mechanics: Dynamics, SI Version, John Wiley & Sons, Inc.,2017.

REFERENCE BOOKS:

1. S SBhavikatti, Engineering Mechanics, New Age International Ltd, 2019.
2. R.C Hibbeler, Engineering Mechanics, Pearson Education Ltd, 2017.
3. A K Tayal, "Engineering Mechanics Statics and Dynamics", Umesh publications, New Delhi ,14/e, 2010.
4. N.H.Dubey,"Engineering Mechanics Statics and Dynamics", Tata McGraw-Hill Education Pvt. Ltd, Noida, 1/e, 2012.
5. Andrew Pytel, JaanKiusalaas, Ishan Sharma,"Engineering Mechanics – Statics, (SI Edition)",Cengage Learning, 3/e, 2010.
6. Andrew Pytel, JaanKiusalaas and Ishan Sharma, "Engineering Mechanics – Dynamics, (SI Edition)",Cengage Learning, 3/e, 2010.

REFERENCE WEBSITE:

1. https://nptel.ac.in/courses/112/103/112103109/
2. https://nptel.ac.in/courses/122/104/122104015/
3. https://www.digimat.in/nptel/courses/video/112106180/L01.html

CO-PO MAPPING:

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	2	-	-	-	-	-	-	-	-
CO2	3	2	2	2	-	-	-	-	-	-	-	-
CO3	3	2	2	2	-	-	-	-	-	-	-	-
CO4	3	2	2	2	-	-	-	-	-	-	-	-
CO5	3	2	2	2	-	-	-	-	-	-	-	-
CO*	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-

I B.Tech. – II Semester

20MEC123	BASIC MECHANICAL ENGINEERING	L	T	P/D	C
		3	-	-	3

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

1. To describe sources of energy and types of power plants and their accessories.
2. To acquire basic knowledge on Internal Combustion Engine system components.
3. To acquire basic knowledge on Refrigeration and Air conditioning system.
4. To learn various aspects of different welding techniques.
5. To provide basic knowledge on engineering design concepts and material handling systems components.

UNIT I: POWER PLANT ENGINEERING (9)

Power Plants: Introduction of renewable sources and non-renewable sources – Working principle of steam, nuclear, gas turbine, diesel, hydroelectric power plants (layout only) – Environmental constraints of power generation. **Steam Boilers and Steam Turbines:** Formation of steam – Working principle of Cochran, Locomotive, Lamont, Benson, Babcock and Wilcox boilers – Differences between fire tube and water tube boilers – Classification and main components of steam turbines – Difference between impulse and reaction turbine.

UNIT II: INTERNAL COMBUSTION ENGINES (9)

Internal Combustion Engines: Classification and components of IC engines – Working principle of two/four stroke petrol and diesel engines – Differences between petrol and diesel engines – Fuel system in petrol and diesel engines – Cooling system and lubrication system – Coil ignition system – Difference between petrol ignition system and diesel ignition system.

UNIT III: REFRIGERATION AND AIR CONDITIONING (9)

Refrigeration: Units of refrigeration – Performance of refrigerator – Refrigerants, properties and types – Vapour-compression and absorption system. **Air Conditioning:** Terminology in air conditioning – Comfort air conditioning – Window, split, and central air conditioning system – Thermo electric cooling system – Basic principle and applications of HVAC system.

UNIT IV: WELDING TECHNOLOGY (9)

Classification of welding process – Types of welds and welded joints – Gas welding – Metal arc welding – Working principle of submerged arc, electro slag, plasma arc, thermit, electron beam, induction, explosive, laser and TIG/MIG welding processes – Friction and friction stir welding – Gas cutting – Welding defects causes and remedies – Brazing and soldering.

UNIT V: DESIGN CONCEPTS AND MATERIAL HANDLING SYSTEM (9)

Design Concepts: Engineering design process – Considerations of a good design – Scope of CAE – Designing to codes and standards – Design review – Societal considerations in engineering design. **Material Handling:** Principles of material handling – Types of material handling equipments – Material transport systems – Industrial trucks, AGVs systems, monorails and other rail guided vehicles – Belt and bucket conveyor systems – Crane and hoists – Basic principle and

applications of belt, rope, chain and gear drives (theory only).

TOTAL HOURS: 45

COURSE OUTCOMES:

On successful completion of the course the student will be able to:		**POs related to COs**
CO1	Acquire knowledge on different types of power plants and their accessories.	**PO1, PO2**
CO2	Familiarize with working principle of two stroke and four stroke engines, cooling, lubrication and ignition system.	**PO1, PO2**
CO3	Familiarize with working principle of refrigeration and air conditioning system and their domestic applications.	**PO1, PO2**
CO4	Demonstrate various types of joining processes and choose the appropriate one according to the	**PO1, PO2**
CO5	Recognize the engineering design concepts and the different types of material handling systems.	**PO1, PO2, PO12**

TEXT BOOKS:

1. G.Shanmugam and M.S.Palanichamy, "Basic Civil and Mechanical Engineering", Tata McGraw Hill Publishing Co., New Delhi , 1996.
2. Venugopal K,Prahu Raja V, "Basic Mechanical Engineering", Anuradha Publishers, Kumbakonam, 2000.

REFERENCE BOOKS:

1. V.Ganesan, "Internal Combustion Engines",Tata McGraw-Hill Education Pvt. Ltd.,Noida , 4/e,2012.
2. P.N. Rao, "Manufacturing Technology",Tata McGraw-Hill Education Pvt. Ltd., Noida, 3/e, 2012.
3. C.P. Arora, "Refrigeration and Air Conditioning", Tata McGraw-Hill Education Pvt. Ltd., Noida, 3/e, 2008.
4. George E.Dieter and Linda C.Schmidt, "Engineering Design", McGraw-Hill Education Pvt.Ltd., Noida, 4/e, 2013.
5. Mikell.P.Groover, "Automation, Production Systems and Computer-Integrated Manufacturing", Pearson Education, New Delhi., 4/e, 2016.

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1. https://www.digimat.in/nptel/courses/video/112105123/L01.html
2. https://www.digimat.in/nptel/courses/video/112105128/L01.html
3. https://www.digimat.in/nptel/courses/video/112107083/L01.htm
4. https://www.digimat.in/nptel/courses/video/112103244/L01.html

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	-
CO2	3	2	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-	2
CO*	**3**	**2**	-	-	-	-	-	-	-	-	-	**2**

I B.Tech. – II Semester

20BSC114	ENGINEERING CHEMISTRY LABORATORY (Common to All Branches)	L	T	P	C
		0	0	2	1

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To provide solid foundation in chemistry laboratory to solve engineering problems.
2. To apply the theoretical principles and perform experiments on hardness of water dissolved oxygen, alkalinity and acidity.
3. To Illustrates the properties of analytical equipments like red wood, Viscometer and conductometry.

LIST OF EXPERIMENTS:

1. Preparation of Standard EDTA solution and Estimation of Hardness of Water
2. Preparation of Standard EDTA and Estimation of Copper
3. Estimation of dissolved oxygen in given water sample
4. Estimation of alkalinity of water
5. Estimation of Acidity of water sample.
6. Preparation of Standard Potassium Dichromate and Estimation of Ferrous Iron
7. Preparation of Standard Potassium Dichromate and Estimation of Copper by Iodometry
8. Determination of strength of the given Hydrochloric acid against standard sodium hydroxide Solution by Conductometric titration
9. Conduct metric titration of $BaCl_2$ Vs Na_2SO_4 (Precipitation Titration).
10. Determination of viscosity of the given oils through Redwood viscometer

COURSE OUTCOMES:

On successful completion of the course the students will be able to		POs related to COs
CO1	Prepare standard solutions	PO1
CO2	Acquire knowledge about volumetric analysis of estimation copper by EDTA and by Iodometry	PO2
CO3	Acquire analytical skills in estimation of hardness of water,Alkanility and Acidity of water, dissolved oxygen in water and estimation of iron through laboratory methods	PO3
CO4	Acquire skills to use instrumental techniques for the determination of electrical conductance of electrolytes and viscosity of lubricants	PO4
CO5	Provide solutions for environmental issues through determination of quality of water	PO6
CO6	Communicate verbally and in written form pertaining to results of the Experiments	PO8
CO7	Learns to perform experiments involving	PO9

	chemistry in future years.	
CO8	Communicate verbally and in written form, the understanding about the experiments.	**PO10**
CO9	Continue updating their skill related to chemistry laboratory.	**PO12**

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	3	-	-	-	-	-	-
CO6	-	-	-	-	-			3	-	-	-	-
CO7	-	-	-	-	-	-	-		3	-	-	-
CO8	-	-	-	-	-	-	-	-	-	3	-	-
CO9	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**3**	**3**	-	**3**	**-**	**3**	**3**	**3**	**-**	**3**

I B.Tech. – II Semester

20BSC115	ENGINEERING PHYSICS LABORATORY (Common to All Branches)	L	T	P	C
		0	0	2	1

COURSE EDUCATIONAL OBJECTIVES:

1. To understands the concepts of interference, diffraction and their applications.
2. To understand the role of optical fiber parameters in communication.
3. Recognize the importance of energy gap in the study of conductivity.
4. To Illustrates the properties of Magnetic and their applications.
5. To understand and evaluate the properties of materials and sounds.

S. NO.	NAME OF THE EXPERIMENT
1	Diffraction grating - Measurement of wavelength of given Laser.
2	To determine the frequency of AC using Sonometer
3	Determination of magnetic field along the axis of a current carrying circular coil -Stewart Gees method
4	Determination of numerical aperture and acceptance angle of an optical fiber
5	Determination of particle size using a laser source
6	Parallel fringes – Determination of thickness of thin object using wedge method
7	Newton's rings – Determination of radius of curvature of given Plano convex lens
8	B-H curve – Determination of hysteresis loss for a given magnetic material
9	Determination of Energy band gap of semiconductor
10	To find the rigidity modulus of the material using torsional pendulum

COURSE OUTCOMES:

On completion of the laboratory course the student will be able to		POs related to COs
CO1	Demonstrate Knowledge on measurement of various physical quantities using optical methods and fundamentals of magnetic fields	PO1
CO2	Identify different physical properties of materials like band gap, magnetic field intensity etc, for engineering and technological applications	PO2
CO3	Provide valid conclusions on phenomena Interference and Diffraction	PO4
CO4	Follow the ethical principles in implementing the programs	PO8
CO5	Do experiments effectively as an individual and as a team member in a group.	PO9
CO6	Communicate verbally and in written form, the understanding about the experiments.	PO10
CO7	Continue updating their skill related to loops, pointers and files implementing programs in future.	PO12

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	3	-	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-	3	-	-	-	-
CO5	-	-	-	-	-	-	-	-	3	-	-	-
CO6	-	-	-	-	-	-	-	-	-	3	-	-
CO7	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**-**	**3**	**-**	**-**	**-**	**3**	**3**	**3**	**-**	**3**

SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)
DEPARTMENT OF CIVIL ENGINEERING

I B.Tech. – II Semester

20ESC112	**ENGINEERING WORKSHOP AND IT WORKSHOP**	**L**	**T**	**P/D**	**C**
	(Common to all branches)	**0**	**0**	**2**	**1**

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To provide exposure to the students with hands on experience on various basic engineering practices in civil, mechanical and electrical engineering.
2. To include training on PC Hardware, Internet & World Wide Web and Productivity Tools including Word, Excel and Power Point.

ENGINEERINGWORKSHOP

TRADES FOR EXERCISES:

1. **Carpentry:** Two exercises from: Middle T lap joint **–** Dove tail lap joint **–** Mortise and tenon joint from out of 300 x 50 x 35 mm soft wood stock.
2. **Sheet Metal:** Two exercise from: Square tray **–** Open scoop **–** Frustum of pyramid from out of 22- or 20-gauge G.I.sheet.
3. **Fitting:** Two exercises from: Square joint **–** V joint **–** Dove tail joint from out of 50 x 50 x 5 mm M.S. flatpiece.
4. **House Wiring:** Two exercise from: Two lamps controlled by one switch in series and parallel **–** One lamp controlled by 2 two-way switches (stair case) **–** Wiring for fluorescent lamp.
5. **Plumbing:** Two exercise from: Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components.
6. **Machining:** Exercise on drilling and tapping.

TRADES FOR DEMONSTRATION:

a) Lathe machine.
b) Grindingmachine.
c) Arc and gaswelding.

COURSE OUTCOMES (ENGINEERING WORKSHOP):

On successful completion of the course, students will be able to		**POs related to COs**
CO1	Demonstrate the knowledge on different tools used in carpentry, fitting, sheet metal, house wiring and plumbing sections and also basic machining process	**PO1**
CO2	Analyze the basic pipeline connection using different joints	**PO2**
CO3	Design and develop simple components by using different materials includes wood, GI sheet and MS plates	**PO3**
CO4	Apply basic electrical engineering tools on the house wiring practice	**PO5**
CO5	Follow the ethical principles in while doing the exercises.	**PO8**

CO6	Do the exercises effectively as an individual and as a team member in a Group	**PO9**
CO7	Communicate verbally among team members and in written form, the understanding about the trade exercises.	**PO10**
CO8	Continue updating their skill related to trades.	**PO12**

TEXT BOOKS:

1. Lab manual provided by the department.

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	2	-	-	-	-	-	-	-	-	-	-
CO3	-	-	2	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	2	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	3	-	-	-	-
CO6	-	-	-	-	-	-	-	-	3	-	-	-
CO7	-	-	-	-	-	-	-	-	-	3	-	-
CO8	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**2**	**2**	**-**	**2**	**-**	**-**	**3**	**3**	**3**	**-**	**3**

A.IT WORKSHOP
PC HARDWARE

1. Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.
2. Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video shall be given as part of the course content.
3. Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.
4. Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva
5. **Hardware Troubleshooting:** Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva
6. **Software Troubleshooting:** Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

LATEX AND WORD

1. Word Orientation: The mentor needs to give an overview of LaTeX and Microsoft (MS) office 2007/ equivalent (FOSS) tool word: Importance of LaTeX and MS office 2007/ equivalent (FOSS) tool Word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word – Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.
2. Using LaTeX and Word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in both LaTeX and Word.

EXCEL

1. Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.
2. Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text.

LATEX AND MS/EQUIVALENT (FOSS) TOOL POWER POINT

1. Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and PowerPoint. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).
2. Second Exercise helps students in making their presentations interactive. Topic covered during this Exercise includes: Hyperlinks, Inserting – Images, Clip Art, Audio, Video, Objects, Tables and Charts.

INTERNET& WORLD WIDE WEB

Internet & World Wide Web -Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers.

Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated by the student to the satisfaction of the instructors. Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computers to be safe on the internet. They need to first install an antivirus software, configure their personal firewall and windows update on their computer.

COURSE OUTCOMES (IT WORKSHOP):

On the successful completion of this course, the student should be able to,		POs related to COs
CO1	Acquire knowledge on computer system such as system unit, input devices, and output devices connected to the computer.	PO1
CO2	Demonstrate the booting process that includes switching on the system, execution of POST routine, then bootstrap loader, and loading of the operating system, and getting it ready for use.	PO2
CO3	Demonstrate the working of the internet that include the use of protocols, domains, IP addresses, URLs, web browsers, web servers, mail-servers, etc.	PO3
CO4	Familiarize with parts of MS Office, To create and save a document,Tosetpagesettings,createheadersandfooters,Touse various formatting features such as bold face, italicize, underline, subscript, superscript, line spacing, etc.	PO5
CO5	Follow the ethical principles in implementing the programs	PO8
CO6	Do experiments effectively as an individual and as a team member in a group.	PO9
CO7	Communicate verbally and in written form, the understanding about the experiments and	PO10
CO8	Continue updating their skill related to MS Office, Internet and Computer in future.	PO12

REFERENCE BOOKS:

1. Vikas Gupta,"Comdex Information Technology course tool kit" , WILEY Dream tech, New Delhi, 2003.
2. Cheryl A Schmidt, "The Complete Computer upgrade and repair book", WILEY Dream Tech,New Delhi, 3/e, 2008.
3. Introduction to Information Technology,ITL Education Solutions limited, Pearson Education, New Delhi, ,2008
4. Kate J. Chase , "PC Hardware and A+ Handbook", Microsoft press,2004.
5. Leslie Lamport, Addison Wesley, LaTeX Companion, New Delhi, 2/e, 2002
6. David Anfinson and Ken Quamme ,"IT Essentials PC Hardware and Software Companion Guide", CISCO Press, Pearson Education, New Delhi,3/e, 2008.
7. Patrick Regan ,"IT Essentials PC Hardware and Software Labs and Study Guide", CISCO Press, Pearson Education, New Delhi, 3/e, 2008, ,
8. S.J.Bigelow , "Troubleshooting, Maintaining and Repairing PCs", TMH, New Delhi,5/e, 2008.

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	-	-	-	-
CO7	-	-	-	-	-	-	-	-	3	-	-	-
CO8	-	-	-	-	-	-	-	-	-	3	-	-
CO9	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**3**	**3**	**3**	-	**-**	**3**	**3**	**3**	-	**3**

I B.Tech. – II Semester

20MEC124	COMPUTER AIDED DRAFTING LAB (Common to Civil and Mechanical Engineering)	L	T	P/D	C
		-	-	3	1.5

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To understand the design of the engineering components in a machine
2. To develop a skill on creating the 2D and 3D models of components
3. To understand part drawing and Assembly of components in a machine

LIST OF EXERCISES:

1. Study of capabilities of software for Drafting and Modeling - Coordinate systems (absolute, relative, polar, etc.) - Creation of simple figures like polygon and general multi-line figures.
2. Drawing of a title block with necessary text and projection symbol.
3. Draw the two dimensional diagram and follow with the principles of dimensioning.
4. Drawing of curves like parabola, spiral, involute using B-spline or cubic spline.
5. Drawing of front view and top view of simple solids like prisms, pyramids, cylinder, cone, etc. with dimensioning.
6. Drawing sectional views of prisms, pyramids, cylinder, cone, etc.
7. Draw the development of surfaces on simple objects like prisms, pyramids, cylinder, cone, etc.
8. Creation of 3D models of simple objects and obtaining 2D multi-view drawings from 3D model.
9. Drawing front view, top view and side view of objects from the given pictorial views. (eg. V-block, base of a mixie, simple stool, objects with hole and curves.)
10. Drawing of simple 3D mechanical components like bolt, nut, screws, shafts, gears and other machine components etc.
11. Drawing of a plan of residential building (two bed rooms, kitchen, hall, etc.)
12. Drawing of a simple steel truss.

Note: Plotting of drawings must be made for each exercise and attached to the records written by students.

COURSE OUTCOMES:

On the successful completion of this course, the student should be able to,		POs related to COs
CO1	Create knowledge on technical drawings and presentations of models from mechanical engineering disciplines.	PO1
CO2	Analyze the 2D diagrams for developing the models.	PO2
CO3	Generate 3D models for various machine components using Autodesk AutoCAD.	PO3

CO4	Select appropriate tools to complete the designing process in AUTOCAD	**PO5**
CO5	Follow ethical principles in designing laboratory and procedures used in software tools.	**PO8**
CO6	Develop the design model in AUTOCAD as an individual.	**PO9**
CO7	Communicate verbally and in written form, the understandings about the experiments.	**PO10**
CO8	Continue updating their skill in designing software package and procedure for various innovation components.	**PO12**

TEXT BOOKS:

1. Lab manual provided by the department.

CO-PO MAPPING:

CO-PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	3	-	-	-	-
CO6	-	-	-	-	-	-	-	-	3	-	-	-
CO7	-	-	-	-	-	-	-	-	-	3	-	-
CO8	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**3**	**-**	**3**	**-**	**-**	**3**	**3**	**3**	**-**	**3**

SREENIVASA INSTITUTE OF TECHNOLOGY AND MANAGEMENT STUDIES
(Autonomous)
DEPARTMENT OF CIVIL ENGINEERING

I B.Tech. – II Semester

20MAC121	HUMAN VALUES AND ETHICS (Mandatory Audit Course)	L	T	P	C
		2	0	0	0

PRE-REQUISITES: **Nil**

COURSE EDUCATIONAL OBJECTIVES:

1. To provide Knowledge in remembering Human Values.
2. To understand about Human Esteem.
3. Toapply basic guidelines on Value Education.
4. Toanalyze the concepts ofHappiness and Prosperity.
5. To evaluate the value of one's body as an instrument.

UNIT I: HUMAN VALUES **(9)**

Morals – Values – Ethics – Human Values – Integrity - Work Ethic – Service – Learning – Civic Virtue

UNIT II: HUMAN ESTEEM **(9)**

Respect for others – living peacefully – Caring – Sharing – Honesty – Courage – Valuing Time – Cooperation – Commitment – Empathy – Self Confidence – Character – Spirituality

UNIT III: VALUE EDUCATION. **(9)**

Understanding the need – Basic guidelines – content and process for value education – self exploration –its content and process – Natural acceptance and experiential validation as the mechanism for self-exploration.

UNIT IV HAPPINESS AND PROSPERITY **(9)**

Continuous Happiness and Prosperity – Basic Human aspirations – right understanding – relationship and physical facilities – the basic requirements for fulfillment of aspirations.

UNIT V UNDERSTANING THE BODY **(9)**

Understanding the body as an instrument of 'I' ('I' being the doer, seer, and enjoyer) – understanding Harmony in the family – the basic unit of human interaction.

TOTAL HOURS: 45

COURSE OUTCOMES:

On successful completion of the course the student will be		POs related to COs
CO1	Remember the concepts on developing Human Values and Ethics.	PO1
CO2	Understand and Develop Knowledge on Human Esteem.	PO8
CO3	Apply basic guidelines on Value Education	PO3,PO6
CO4	Analyze and follow How to maintain happiness and Prosperity.	PO4
CO5	Evaluate the Value of Oneself as an Instrument.	PO4

REFERENCES:

1. R.S. Naagarazan, "A Text Book on Professional Ethics and Human Values",New age International Publishers, New Delhi ,2014
2. Jayshree Suresh &B.S.Raghavan, "Human Values and Professional Ethics",S.Chand& Company, New Delhi, 2010
3. R.R Gaur, R Sangal, G P Bagaria, "The text book, A foundation course in Human Values and professional Ethics, Excel books, New Delhi, 2010.
4. R.R Gaur, R Sangal, G P Bagaria,"The teacher's manual, A foundation course in Human Values and professional Ethics – Teachers Manual", Excel books, New Delhi, 2010.

REFERENCE WEBSITE:

1. https://www.vlab.co.in/broad-area-electronics-and-communications
2. https://nptel.ac.in/courses/122/106/122106025
3. https://nptel.ac.in/courses/117/103/117103063

CO-PO MAPPING:

CO-P(	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-	3	-	-	-	-
CO3	-	-	3	-	-	3	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	3	-	-	-	-	-	-	-	-
CO*	**3**	**-**	**3**	**3**	**-**	**3**	**-**	**3**	**-**	**-**	**-**	**-**

II B.Tech. - III Semester

20BSC231 NUMERICAL METHODS AND PROBABILITY THEORY **L T P C**
(Common to CIVIL, MECH, ECE, CSE & AIML)
3 1 - 4

PRE-REQUISITES: A Course on Algebra & Calculus, Differential equations & Transform Techniques

COURSE EDUCATIONAL OBJECTIVES:

1. To develop skill to analyze appropriate method to find the root of the Algebraic and Transcendental Equations and to develop skill to apply the concept of interpolation for the Prediction of required values
2. To learn the method of evaluation of numerical integration and to solve ordinary differential equations numerically using numerical methods
3. To develop skill to analyze the discrete and continuous data
4. To develop skill to analyze the discrete and continuous data using appropriate Statistical Distributions like Binomial, Poisson, Normal etc., and To inculcate skill to investigate different applications of statistical distributions and the corresponding conclusions required for the analysis of sample data.
5. To develop skill in testing of hypotheses and Tests of significance for small and large samples

UNIT I: SOLUTION OF ALGEBRAIC, TRANSCENDENTAL EQUATIONS & INTERPOLATION (9)

Solution of Algebraic and Transcendental Equations: Introduction - The Bisection method - The method of False position - The Iteration method - Newton-Raphson method (Single Variable).

Interpolation: Introduction - Finite differences - Forward differences, Backward differences - Newton's forward, Newton's backward - Lagrange's method of interpolation.

UNIT II: NUMERICAL INTEGRATION AND NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS (9)

Numerical integration: Trapezoidal rule - Simpson's 1/3 Rule - Simpson's 3/8 Rule.

Numerical solution of Ordinary Differential equations: Solution by Taylor's series - Picard's method of successive approximations - Euler's method - Runge-Kutta methods.

UNIT III: PROBABILITY, RANDOM VARIABLES (9)

Probability: Sample space and events - Probability - The axioms of probability - Some elementary theorems - Conditional probability - Baye's theorem.
Random variables: Discrete and continuous distributions – Statistical Parameters (Mean, Variance and Standard Deviation) of distribution functions.

UNIT IV: PROBABILITY DISTRIBUTIONS & SAMPLING THEORY (9)

Binomial - Poisson and Normal distributions - Related properties.
Sampling distribution: Populations and samples - Sampling distributions of mean

(σ: known and unknown) - Proportions - Sums and differences.

UNIT V: TEST OF HYPOTHESIS AND TEST OF SIGNIFICANCE (9)

Test of Hypothesis: Means - Hypothesis concerning one and two means - Type I and Type II errors - One tail, two-tail tests.
Test of Significance: Student's t-test - F-test - Chi-square test of goodness of fit.

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		POs related to COs
CO1	Demonstrate knowledge in solving algebraic and transcendental equations by various mathematical methods and Design novel mathematical methods for constructing the interpolating polynomials to the given	PO1,PO2
CO2	Demonstrate knowledge infinding the numerical values to integrals through different mathematical methods and solving ordinary differential equations numerically through various methods and Design novel mathematical methods for solving the ordinary	PO1,PO2
CO3	Demonstrate knowledge on use the probability and Random Variables in the field of engineering	PO1,PO2,PO3
CO4	Demonstrate knowledge in probability distributions and develop analytical skills for the problems involving means, probability distributions and standard deviations sampling techniques for decision making in	PO1,PO2,PO3
CO5	Demonstrate knowledge in testing of hypotheses and Tests of significance for small and large samples and Develop skills for analyzing the data with suitable tests of significance for practical situations through probability distributions	PO1,PO2,PO3,PO4

TEXT BOOKS:

1. S.C. Gupta, V.K. Kapoor, "Fundamentals of Mathematical Statistics", 10/e, 2001, S. Chand and Company Publishers, New Delhi.
2. T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham and M.V.S.S.N. Prasad , "Probability and Statistics", 2012, S. Chand and Company Publishers, New Delhi.

REFERENCE BOOKS:

1. V. Ravindranath, T.S.R. Murthy,"Probability and Statistics, 2011, I.K. International Pvt. Ltd, New Delhi.
2. Johnson A. Richard, Miler &Fruends,"Probability and Statistics for Engineers", 6/e, 2006, Pearson Education, New Delhi.
3. Dr. B. S. Grewal, "Higher Engineering Mathematics", 34/e, 1999, Khanna Publishers, Delhi
4. Dr. J. Ravichandran, "Probability and Statistics for Engineers", 2011, Wiley-India Publishers, New Delhi.

5. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, "Probability and Statistics for Engineers and Scientists", 7/e, 2002, Pearson Education Asia, New Delhi.

REFERENCE WEBSITE:

1. https://www.youtube.com/watch?v=hizXlwJO1Ck
2. https://www.youtube.com/watch?v=5817fLmsTGE
3. https://www.youtube.com/watch?v=yv6i9plC9nk
4. https://www.youtube.com/watch?v=r1sLCDA-kNY&list=PL46B9EA2CFEB51241
5. https://www.youtube.com/watch?v=r1sLCDAkNY&list=PL46B9EA2CFEB51241&index=1
6. https://www.youtube.com/watch?v=HnvB8BCDQm0&list=PL46B9EA2CFEB51241&index=2

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO.1	3	3	-	-	-	-	-	-	-	-	-	-
CO.2	3	3	-	-	-	-	-	-	-	-	-	-
CO.3	3	3	2	-	-	-	-	-	-	-	-	-
CO.4	3	3	2	-	-	-	-	-	-	-	-	-
CO.5	3	3	2	2	-	-	-	-	-	-	-	-
CO*	**3**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	-

II B.Tech. - III Semester

20ESC235	STRENGTH OF MATERIALS	L T P C
		2 1 - 3

PRE-REQUISITES: A Course on Engineering Mechanics

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To able analyze the principal stresses and strains
CEO2: To gain knowledge about shear force and bending moment diagrams
CEO3: To able to analyze the flexural stresses and shear stresses
CEO4: To gain knowledge about columns with different end condition
CEO5 : To able to design shaft and springs

UNIT – I: SIMPLE STRESSES AND STRAINS (9)

Introduction – Deformable bodies **-** Elasticity and Plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses, thermal stresses in composite bars,

Principal stresses and strains:

Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear – Mohr's circle of stresses – Principal stresses and strains – Analytical

UNIT–II: SHEAR FORCE AND BENDING MOMENT DIAGRAMS (9)

Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed load, inclined load, couples and combination of these loads- – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam

UNIT III: FLEXURAL STRESSES (9)

Theory of simple bending – Assumptions – Derivation of bending equation: M/I =f/y = E/R – Neutral axis –-strength of a section Determination of bending stresses – Section modulus of rectangular and circular sections (Solid and Hollow), I, T sections – Design of Rectangular, circular, I, T Sections.

SHEAR STRESSES: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T and angle sections

UNIT – IV: COLUMNS (9)

Introduction – Types of columns – Short, and long columns – Axially loaded compression members – Crushing load – Euler's theorem for long columns – assumptions – derivation of Euler's critical load formulae for various end conditions – Equivalent length of a column – Slenderness ratio Euler's critical stress – Limitations of Euler's theory – Rankine- Long columns subjected to eccentric loading – Empirical formulae.

Unit –V: TORSION (9)

Theory of pure torsion – Derivation of Torsion equations: – Assumptions made in the theory- Theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts

SPRINGS: Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull

Total Hours: 45

COURSE OUTCOMES:

On completion of the course the students will be able to		POs related to COs
CO1	Acquire knowledge on simple stresses and strains, exhibit the different loading conditions.	PO1, PO2
CO2	Identify appropriate beams for different structures and Analyze shear force and Bendingmoment for various beams with different loading conditions	PO1, PO2
CO3	Analyze the Flexural stresses and shear stress distribution across various beam sections	PO1, PO2
CO4	Obtain Knowledge on different types columns for various end conditions and with different methods	PO1, PO2,
CO5	Obtain Knowledge on analysis of torsional equation and springs subjected to axial pull	PO1, PO2

TEXTBOOKS:

1. Dr.B.C.Punmia, Ashok Kumar Jain, Arun Kumar Jain,"Mechanics of Materials", LakshmiPublications.
2. R.K Rajput," Strength of Materials"S.Chand& CompanyLtd.
3. B.S.Basavarajaiah ,"Strength of Materials", Universities Press, Hyderabad

REFERENCES:

1. Ghosh & Datta," Strength of Material" New AgePublishers
2. Dr.R.K.Bansal ,"Strength of Materials", Lakshmi Publications.
3. S.S.Rattan ,"Strength of Materials " TMHPublishers.

REFERENCE WEBSITE:

https://nptel.ac.in/courses/105/105/105105108/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	-	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-
CO4	2	3	-	-	-	-	-	-	-	-	-	-
CO5	2	3	-	-	-	-	-	-	-	-	-	-
CO*	**2.6**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

II B.Tech. - III Semester

20CIV231 BUILDING MATERIALS AND CONSTRUCTION L T P C

3 - - 3

PRE-REQUISITES: A Course on Engineering chemistry

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To teach students about the Physical and Mechanical properties of construction materials and their respective testing procedure.

CEO2: To teach students about the building materials available in market to be used for many components of building industry.

CEO3: To teach students about the modern construction materials available in market to be used for many components of building industry.

CEO4: To teach students about the principles and methods to be followed in constructing various components of a building.

CEO 5: to gain knowledge about building services like ventilation, lighting and air conditioning

UNIT I CONSTRUCTION MATERIALS- STONES, BRICK AND TILES (9)

Importance – Classification of construction materials – Properties of materials.IS Standards for Building materials and construction.

STONES: Properties of building stones – Relation to their structural requirements – Classification of stones – Dressing of stones – Natural bed – Testing of stones.

BRICKS: Composition of good brick earth – Methods of manufacturing of bricks – Comparison between clamp burning and kiln burning –Qualities of a good brick- Testing of bricks.

TILES: Characteristics of good tile- Manufacturing Methods-Types of tiles – Testing of tiles.

UNIT II CONSTRUCTION MATERIALS- STEEL, CEMENT AND WOOD (9)

STEEL: Importance – Types of steels- Properties of steels and usage-Testing procedures of steels.

CEMENT: Functions of ingredients of cement – Properties of cement – Types of cements –Testing of cements – Hydration of cement and hydration products.

WOOD: Structure – Properties – Seasoning of timber- Classification of various types of wood used in buildings –Defects in timber.

UNIT III MODERN MATERIALS OF CONSTRUCTION (9)

CONCRETE: Importance of W/C Ratio, Strength, ingredients including admixtures, workability, testing for strength, elasticity, non-destructive testing, mix design methods.

MODERN MATERIALS OF CONSTRUCTION: Galvanized iron, Fiber-reinforced plastics, steel aluminum, Properties and uses of iron, aluminum, glass, plastic, rubber, gypsum.

UNIT IV BUILDING COMPONENTS (9)

Foundation, Sub and Super structure, roofing, doors and windows and flooring.

FOUNDATIONS: Shallow foundations – Spread, combined strap and mat footings.

FLOORS: Materials used-Different types of floors-Concrete, mosaic, terrazzo, tiled floors.

ROOFS: Pitched, flat and curved roofs _ Lean-to-roof, couple roofs, trussed roofs- King and queen post trusses – RCC roofs.
STAIRS: Terminology – Types of stairs

UNIT V SURFACE FINISHES (9)

Plastering – Pointing – White washing and distempering –Damp proofing- Painting – Constituents of paint – Types of paints – Processing and defects of painting. Form work and scaffolding.

BUILDING SERVICES

VENTILATION: Necessity – Functional requirements – Natural and mechanical ventilation.
LIGHTING: Day and artificial lighting – Types of lighting in working places.
FIRE PROTECTION: Causes – Fire load – General fire safety requirements – Fire resistant Construction, rainwater harvesting for buildings.

Total Hours: 45

COURSE OUTCOMES:

On completion of the course the students will be able to		POs related to COs
CO1	Learn and identify the relevant physical and mechanical properties pertaining to the construction industry.	PO1
CO2	Demonstrate the relevant BIS testing procedure to be carried out to ascertain the quality of building materials.	PO1,PO3
CO3	Develop ability to choose the modern construction material appropriate to the climate and functional aspects of the buildings	PO1,PO3,PO4
CO4	Ability to supervise the construction technique to be followed in brick, stone and hollow block masonry, Concreting, flooring, roofing, plastering and building services	PO1,PO4
CO5	Learn and identify orientation of the buildings like ventilation, air conditioning and fir fighting	PO1,PO2

TEXTBOOKS:

1. S K Duggal," Building Material" New Age International Publishers; SecondEdition
2. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain," Building Construction "LaxmiPublications(P) ltd., New Delhi
3. M.L.Gambhir," Building Materials" TMHPubilishers.
4. R.N.Raikar," Diagnosis and treatment of structures in distress", Published by R&D Centreof Structural Designers & Consultants Pvt.Ltd., Mumbai,1994.

REFERENCES:

1. W.B.Mckay ,"Building construction ", Vol.I, II, III & IV Pearson Publications, 2013edition.
2. P.C. Varghese," Building Construction", Prentice-Hall of India private Ltd, NewDelhi.

3. S.K.Sharma ,"A Textbook on Building Construction", S.ChandPubilishers.

REFERENCE WEBSITE:

https://nptel.ac.in/courses/105/102/105102088/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	3	-	2	-	-	-	-	-	-	-	-	-
CO3	3	-	2	1	-	-	-	-	-	-	-	-
CO4	3	-	-	2	-	-	-	-	-	-	-	-
CO5	3	2	-	-	-	-	-	-	-	-	-	-
CO*	**3**	**2**	**2**	**1.5**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

II B.Tech. - III Semester

20CIV232 FLUID MECHANICSAND HYDRAULIC MACHINERY L T P C
2 1 - 3

PRE-REQUISITES: A Course on Engineering Mechanics

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To understand the and fluid statics
CEO2: To understand the concept fluid kinematics and fluid dynamics
CEO3: To understand losses in pipe flow
CEO4: To understand the characteristic open channel flow
CEO5: To understand different types pumps and turbines

UNIT - I INTRODUCTION TO FLUID STATICS (9)

Distinction between a fluid and a solid - characteristics of fluids - Fluid Pressure: Pressure at a point, Pascal's law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U Tube Differential Manometer. pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces. Buoyancy and stability of floating bodies.

UNIT - II FLUID KINEMATICS AND DYNAMICS (9)

Classification of fluid flow - Stream line, path line, streak line and stream tube; stream function, velocity potential function. One, two and three - dimensional continuity equations in Cartesian coordinates.

Fluid Dynamics: Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – derivation; Energy Principle; Practical applications of Bernoulli's equation :Venturimeter, orifice meter and Pitot tube; Momentum principle; Forces exerted by fluid flow on pipe bend; Vortex Flow – Free and Forced; Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number;

UNIT - III ANALYSIS OF PIPE FLOW (9)

Energy losses in pipelines; Darcy – Weisbach equation; Minor losses in pipelines; Hydraulic Grade Line and Total Energy Line; Concept of equivalent length – Pipes in Parallel and Series. Laminar Flow- Laminar flow through: circular pipes, annulus and parallel plates. Stoke's law, Measurement of viscosity. Reynolds experiment, Transition from laminar to turbulent flow. Resistance to flow of fluid in smooth and rough pipes-Moody's diagram – Introduction to boundary layer theory.

UNIT - IV FLOW IN OPEN CHANNELS (9)

Open Channel Flow-Comparison between open channel flow and pipe flow, geometrical parameters of a channel, classification of open channels, classification of open channel flow, Velocity Distribution of channel section. Uniform Flow-Continuity Equation, Energy Equation and Momentum Equation, Characteristics of uniform flow, Chezy's formula, Manning's formula. Computation of Uniform flow.Specific energy, critical flow, discharge curve, Specific force, Specific depth, and Critical depth. Measurement of Discharge and Velocity – Broad Crested Weir. Gradually Varied Flow. Hydraulic Jump and classification - Elements and characteristics- Energy dissipation.

UNIT - V HYDRAULIC MACHINES (9)

Impact of Jets- Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes - velocity triangles at inlet and outlet - Work done and efficiency - Hydraulic Turbines: Classification of turbines; pelton wheel and its design. Francis turbine and its design - efficiency - Draft tube: theory - characteristic curves of hydraulic turbines - Cavitation - Working principles of a centrifugal pump, work done by impeller; heads, losses and efficiencies; minimum starting speed; Priming; specific speed; limitation of suction lift, net positive suction head (NPSH); Performance and characteristic curves; Cavitation effects; Multistage centrifugal pumps; troubles and remedies – Introduction to Reciprocating Pump.

Total Hours: 45

COURSE OUTCOMES:

On completion of the course the students will be able		**POs related to COs**
CO1	Familiarize basic terms used in fluid mechanics	**PO1**
CO2	Understand the principles of fluid statics, kinematics and dynamics	**PO1, PO2**
CO3	Understand flow characteristics and classify the flows and estimate various losses in flow through channels	**PO1, PO2**
CO4	Analyze characteristics for uniform and non-uniform flows in open channels.	**PO1, PO2**
CO5	Design the different types of turbines, centrifugal and multistage pumps.	**PO1, PO2,PO3,PO5**

TEXTBOOKS:

1. R.K. Rajput ,"A Textbook of Fluid Mechanics" , S. Chand 5th Edition, Laxmi Publishers,2013.
2. R.K. Bansal," Fluid Mechanics and Hydraulic Machines" , 9th Edition, Laxmi Publishers,2011.

REFERENCE BOOKS:

1. P.N. Modi and S.M. Seth, "Hydraulics and Fluid Mechanics Including Hydraulic Machines" , 20th Edition, Standard Book House,2011.
2. J.F. Douglas, J.M. Gaserek and J.A., Swaffirld "Fluid Mechanics", 5 th Edition, Longman,2010.
3. S.K. Som and G. Biswas "Introduction to Fluid Machines", , 2nd Edition, Tata McGraw–Hill Publishers Pvt. Ltd,2010.
4. Domkundwar "A Textbook of Fluid Mechanics and Hydraulic Machines", 6th Edition, Dhanpat Rai and Co,2014.

REFERENCE WEBSITES:

https://nptel.ac.in/courses/105/103/105103192/

https://nptel.ac.in/courses/105/101/105101082/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-
CO4	3	3	-	-	-	-	-	-	-	-	-	-
CO5	2	3	2	-	3	-	-	-	-	-	-	-
CO*	**2.8**	**2.6**	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

II B.Tech. - III Semester

20CIV233	SURVEYING	L T P C
		2 1 - 3

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To ensure that the student develops knowledge of the basic and conventional surveying instruments,
CEO2: To acquire knowledge on compass and plane table surveying
CEO3: To acquire knowledge on leveling and contour surveying
CEO4: To gain knowledge on traverse surveying
CEO 5: To acquire knowledge on computation area and volume in the field

UNIT–I: BASIC CONCEPTS (9)

Surveying – History; Definition; primary divisions, Classification, Principles of surveying Plan and map; Basic Measurements; Instruments and Basic methods; Units of measurement, Scales used for Maps and plans, Duties of a surveyor. Errors: Accuracy and Precision Sources and types of errors, theory of probability.

Chain surveying: Instruments for chaining, ranging out, chaining a line on a flat ground; chaining on an uneven or a sloping ground; Chain & Tape corrections; Degree of accuracy. Principles of chain surveying; Basic definitions; Well-Conditioned Triangle, Field book, Field work; Offsets, Cross Staff survey; obstacles in chain survey-problems, Conventional signs.

UNIT-II: COMPASS SURVEY (9)

Introduction, Bearings and angles, Designation of bearings, Conversion of bearings from one system to the other, fore bearing and back bearing, Calculation of bearing from angles, Theory of Magnetic compass (i.e. Prismatic compass), Temporary adjustments of compass-Magnetic Declination, Local Attraction-Related Problems-Errors in compass survey.

Plane table surveying: Introduction, Accessories, Working operations, Methods of plane tabling, Three-point problem-Mechanical method - Graphical method, Two-point problem, Errors in plane tabling

UNIT-III: LEVELLING (9)

Introduction, basic definitions, methods of leveling, leveling instruments: dumpy level, leveling staff, Temporary adjustments of dumpy level, theory of simple and differential leveling, Level field book, Classification of direct leveling methods, Reciprocal leveling, Profile leveling and Cross sectioning, Curvature and Refraction, Difficulties in leveling, errors in leveling.

Contouring: Introduction, contour interval, Characteristics of contours Methods of locating contours - Direct and indirect methods; Interpolation and sketching of contours, Contour Gradient-Uses of contour maps.

UNIT-IV: TRAVERSE SURVEYING (9)

Introduction, Selection and marking of traverse stations, methods of traversing,

traversing by free needle and fast needle method, traversing by direct observation of angles, checks in closed traverse, closing error, methods of balancing the traverse, Gale's traverse table, Omitted measurements.

UNIT-V: COMPUTATION OF AREAS AND VOLUMES (9)

Methods of determining areas, areas by sub-division into triangles, areas from offsets to a base line: regular and irregular intervals, area by double meridian distances, area by co-ordinates. Embankments and cutting for a level section, two level sections, three level section and multi-level section, capacity of a reservoir.

Minor instruments: Uses and working of the minor instruments: hand level, line ranger, optical square, Abney level, clinometers, pentagraph, sextant and planimeter.

Total Hours: 45

COURSE OUTCOMES:

On completion of the course the students will be able to		POs related to COs
CO1	Demonstrate the knowledge on chain, compass, plane table, auto level, areas and volumes	PO1, PO2,PO4
CO2	Analyze surveying techniques, tools and survey data	PO1, PO2, PO3,
CO3	Design different types of levelling and prepare contour maps	PO1, PO2, PO3, PO5
CO4	Solve complex engineering survey problems through proper survey and interpretation	PO1, PO2, PO4
CO5	Use appropriate modern tools in surveying	PO1, PO2,PO5

TEXTBOOKS:

1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain," Surveying (Vol – 1)" Laxmi publications (P) Ltd., New Delhi
2. C.Venkataramaiah , "Text book of surveying", Universities Press.
3. Duggal S.K," Surveying (Vol – 1)", Tata McGraw Hill Publishing Co.Ltd. New Delhi,2004.

REFERENCES:

1. Chandra AM ,"Plane Surveying " , New age International PVt.Ltd., Publishers,New Delhi,2002
2. Arora K R," Surveying (Vol-1)", Standard Book House, Delhi,2004
3. SatheeshGopi, R.Shanta Kumar and N.Madhu ,"Advanced Surveying" , Pearsoneducation

REFERENCE WEBSITE:

https://nptel.ac.in/courses/105/104/105104101/

https://nptel.ac.in/courses/105/107/105107122/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	2	-	1	-	-	-	-	-	-	-	-
CO2	2	2	1	-	-	-	-	-	-	-	-	-
CO3	2	2	1	-	1	-	-	-	-	-	-	-
CO4	2	2	-	1	-	-	-	-	-	-	-	-
CO5	1	1	-	-	1	-	-	-	-	-	-	-
CO*	**1.6**	**1.8**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

II B.Tech. - III Semester

20CIV234	BUILDING PLANNING USING AUTOCAD	L	T	P	C
		-	1	2	2

PRE-REQUISITES: A Course on Engineering graphics

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To understand the regulations as per National Building Code

CEO2: To understand the sketches and working for (residential building) drawings

CEO3: To understand the sketches and working for (public building) drawings

UNIT-I PRINCIPLES OF BUILDING PLANNING

Introduction – Selection of Site – Orientation, location of buildings, thermal comfort, roominess, grouping, circulation, privacy, sanitation, elegance.

1. Conventional signs used in building drawing
2. Drawing the doors, windows and ventilator

UNIT-II PLANNING OF RESIDENTIAL BUILDINGS

Introduction-Minimum standards for various parts of the buildings - Requirements of different rooms and their grouping-Verandah-Drawing room –Bed room-Kitchen-Dining room-Store room- Bath room-Water closet-Staircase-Garrage.

1. Drawing plan, elevation and section of a single storied residential building for the given line sketch and specifications
2. Drawing plan, elevation and section of a residential building with RCC roof

UNIT – III PLANNING OF PUBLIC BUILDINGS

Introduction-Educational buildings-Hospitals and dispensaries-Office buildings-Banks-Industrial buildings-Hotels and motels-Buildings for recreation, Master Plan Preparation.

1. Drawing plan, elevation and section of an industrial building for the given line sketch and specifications
2. Planning and drawing of plan, elevation and section of a single storied Public building (Primary Health Center)with RCC roof for the given site and accommodation details.
3. Planning and drawing of plan, elevation and section of a single storied Public building (School Building) with RCC roof for the given site and accommodation details.
4. Planning and drawing of plan, elevation and section of a single storied Public building (Office)with RCC roof for the given site and accommodation details.
5. Planning and drawing of plan, elevation and section of a single storied Public building (Police Station) with RCC roof for the given site and accommodation details.
6. Planning and drawing of plan, elevation and section of a single storied Public building (COURT) with RCC roof for the given site and accommodation details.

Total Hours: 30

COURSE OUTCOMES:

On completion of the course the students will be able to:		POs related to Cos
CO1	Identify the factors to be considered in planning and construction of buildings.	PO1, PO5
CO2	Design and plot residential building	PO1, PO5, PO7, PO6
CO3	Design and plot the public building	PO1, PO3,PO4, PO5, PO7

TEXTBOOKS:

1. Gurucharansingh and Jagadishsingh,"Planning and Designing and Scheduling" , 2009, StandardPublishers.
2. Dr. N.Kumaraswamy and A.Kameswararao,"Building planning and Drawing", 2012 Charatorpublications

REFERENCES:

1. Y.S. Sane," Planning and Designing of buildings", Third edition, , Allies BookStall.
2. Building by laws by state and Central Governments and Municipal corporations, National BuildingCode.
3. M.G.Saha, G.M.Kale, S.Y.patki,"-Building drawing with an integrated approach to building environment-Tata Mc GrawHill.

REFERENCE WEBSITES:

https://nptel.ac.in/courses/105/107/105107156/

COURSE OUTCOMES:

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	2	-	-	-	-	-	-	-
CO2	1	-	-	-	2	2	2	-	-	-	-	-
CO3	3	-	3	3	2	-	2	-	-	-	-	-
CO*	**2.6**	-	**3**	**3**	**2**	**2**	**2**	**-**	**-**	**-**	**-**	-

II B.Tech. – III Semester

20ESC236 STRENGTH OF MATERIALS LABORATORY L T P C

- - 3 1.5

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

CEO1: The objective of the course is to make the student to understand the behavior of materials under different types of loading for different types structures.

LIST OF EXERCISES:

1. Tension test.
2. Deflection test on (Steel/Wood) Cantilever beam.
3. Deflection test on simple support beam.
4. Torsion test.
5. Hardness test.
6. Spring test.
7. Compression test on wood
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem onbeams

COURSE OUTCOMES:

On completion of the course the students will be able to		POs related to Cos
CO1	Acquire the knowledge on conducting experiments for testing strength of various materials	PO1
CO2	Analyze the behavior of simple structural elements under simple loadings	PO2
CO3	Design the materials strength using various impact and deflection test.	PO3
CO4	Use appropriate modern tools in surveying	PO5
CO5	Follow the ethical principles while doing the experiments	PO8
CO6	Do the experiments effectively as an individual and as a team member in a group.	PO9
CO7	Communicate verbally and in written form pertaining to results of the experiments	PO10
CO8	Continue updating their skill related to material strength in future.	PO12

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-		-	-	3	-	-	-	-
CO6	-	-	-	-	-	-	-		3	-	-	-
CO7	-	-	-	-	-	-	-	-	-	3	-	-
CO8	-	-	-	-	-	-	-	-	-	-	-	3
CO*	3	3	3	-	3	-	-	3	3	3	-	3

II B.Tech. - III Semester

20CIV235 FLUID MECHANICS LABORATORY L T P C
- - 3 1.5

PRE-REQUISITES: Nil

COURSE EDUCATION OBJECTIVES:

CEO 1: To understand the flow measurement in a pipe flow
CEO 2: To determine the energy loss in pipe flow
CEO 3: To study the characteristics of turbines
CEO 4: To study the characteristics of pumps
CEO 5: To measure the discharge in a open channel flow

LIST OF EXPERIMENTS:

1. Calibration of Venturi meter
2. Calibration of Orifice meter
3. Determination of Coefficient of discharge for a small orifice by a constant head method.
4. Determination of Coefficient of discharge for an external mouthpiece by variable head method.
5. Calibration of Rectangular Notch
6. Calibration of Triangular Notch and Trapezoidal Notch
7. Determination of Coefficient of friction in different Pipes.
8. Verification of Bernoulli's equation.
9. Determination of Coefficient of loss of head in a sudden contraction, sudden enlargement, pipe bends etc.
10. Calibration of Turbine Flow Meter.

COURSE OUTCOMES:

On successful completion of the course, Students will be able to		**POs related to COs**
CO1	Explain the practical knowledge about on handling various flow measuring devices	**PO1**
CO2	Understand the concept of each equipment and various flow measuring devices	**PO2**
CO3	Describe the parameter of knowledge in the area of flow measurement	**PO3**
CO4	Conduct the experiment and interpret data for solving the design problems	**PO4**
CO5	Develop characteristics of Flow Measuring Devices	**PO5**
CO6	Follow the ethical principles while doing the experiments	**PO8**
CO7	Do the experiments effectively as an individual and as a team member in a group.	**PO9**
CO8	Communicate verbally and in written form pertaining to results of the experiments	**PO10**
CO9	Continue updating their skill related to manufacturing process in Future.	**PO12**

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	-	-	-	-
CO7	-	-	-	-	-	-	-	-	3		-	-
CO8	-	-	-	-	-	-	-	-		3	-	-
CO9	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**3**	**3**	**3**	-	-	**3**	**3**	**3**	-	**3**

II B.Tech. - III Semester

20CIV236	SURVEYING LABORATORY	L T P C
		- - 3 1.5

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

CEO1: Student shall learn the conduct of standard practices using instruments like chain, compass, dumpy level, theodolite in the field and to plot from field data.

CEO2: Student shall learn the conduct of leveling and grid contouring by different methods.

List of Experiments:

I. Chain Surveying:

1. To find the area of the given plot using chain, tape & cross–staff.
2. To find the distance between inaccessible points.

II. Compass Surveying:

3. Traversing using prismatic compass.
4. To find the distance between inaccessible points.

III. Plane table Surveying:

5. Radiation method and Intersection methods
6. Traversing method

IV. Levelling:

7. Fly levelling, reduction of levels by rise and fall method.
8. Differential levelling, reduction of levels by height of collimation method.
9. Profile levelling: L.S. and C.S.
10. Preparation of contour map.

V. Plotting:

11. Conventional signs and symbols used in surveying.
12. Plotting of L.S. &C.S

COURSE OUTCOMES:

On successful completion of the course the student will be able to,		POs related to COs
CO1	Demonstrate the knowledge on chain, compass, plane table, auto level, areas and volumes	PO1
CO2	Analyze surveying techniques, tools and survey data	PO2
CO3	Design different types of levelling and prepare contour maps	PO3
CO4	Solve complex engineering survey problems through proper survey and interpretation	PO4

CO5	Use appropriate modern tools in surveying	**PO5**
CO6	Follow the ethical principles while doing the experiments	**PO8**
CO7	Do the experiments effectively as an individual and as a team member in a group.	**PO9**
CO8	Communicate verbally and in written form pertaining to results of the experiments	**PO10**
CO9	Continue updating their skill related to surveying in future.	**PO12**

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	-	-	-	-
CO7	-	-	-	-	-	-	-	-	3	-	-	-
CO8	-	-	-	-	-	-	-	-	-	3	-	-
CO9	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**3**	**3**	**3**	-	-	**3**	**3**	**3**	-	**3**

II B.Tech. - IV Semester

20BSC242 MATHEMATICAL MODELLING & QUANTITATIVE TECHNIQUES **L T P C**

2 1 - 3

Course Educational Objectives:

CEO1: To Identify & solve the Linear Programming Problems under constrained conditions

CEO2: To formulate and solve the transportation and for optimum solution

CEO3: To formulate assignment and sequencing models for optimum solution

CEO4: To understand the network analysis techniques

CEO5: To expand the basic knowledge on game theory for optimization

UNIT – 1: LINEAR PROGRAMMING PROBLEMS (9)

Definition – Characteristics – Linear programming problem formulation – Graphical solution – Simplex method – Artificial variables techniques – Two-phase method – Big-M method

UNIT – 2: TRANSPORTATION PROBLEMS (9)

Transportation Problem: Formulation – Finding basic feasible solutions – North west corner rule, least cost method and Vogel`s approximation method – Optimal solution by MODI method – Unbalanced transportation problem – Degeneracy.

UNIT – 3: ASSIGNMENT AND SEQUENCING MODELS (9)

Assignment Problem: Formulation – Optimal solution – Variants of assignment problem – Traveling salesman problem.

Sequencing: Introduction – Flow – Shop sequencing – 'n' jobs through two machines – 'n' jobs through three machines – Job shop sequencing – Two jobs through 'm' machines.

UNIT – 4: PROJECT NETWORKS (9)

Project network – Critical Path Method (CPM) and Program Evaluation and Review Technique (PERT) – Critical path-critical activities – Determining minimum time required to complete the project, Probability of completing the project.

UNIT – 5: GAME THEORY (9)

Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – 2×2 games – Dominance principle – m×2 and 2×n games – Graphical method.

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, Students will be able to		**POs related to COs**
CO1	Formulate and solve engineering & managerial situations as LPP	**PO1, PO2, PO3, PO7**
CO2	Solve transportation problems	**PO1,PO2,PO3,PO7**
CO3	Solve the assignment Problem and determine optimum processing of job order	**PO1,PO2,PO3,PO7, PO11**
CO4	Construct network diagram & estimate the minimum time required to complete the Project	**PO1,PO2,PO3**
CO5	Solve game theory problems	**PO1,PO2,PO3**

TEXT BOOKS:

1. Operations Research, P. SankaraIyer, 1/e, McGraw Hill Education (India) Private Ltd.
2. Operations Research, R. Panneerselvam, 2/e, PHI, Learning (P) Ltd.

REFERENCE BOOKS:

1. Operations Research an Introduction, Hamdy A. Taha, 8/e, Prentice Hall of India Pvt. Ltd.
2. Operations Research, Frederick S. Hiller and Gerald J. Liberman, 8/e, Tata McGraw Hill Education Pvt. Ltd.
3. Quantitative Techniques in Management, N D Vohra, 4/e, McGraw Hill Education (India) Private Ltd.

REFERENCE WEBSITES:

1. https://nptel.ac.in/courses/111/107/111107128/
2. https://nptel.ac.in/courses/110/106/110106062/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	-	-	-	2	-	-	-	-	-
CO2	3	3	2	-	-	-	2	-	-	-	-	-
CO3	3	3	2	-	-	-	2	-	-	-	2	-
CO4	3	3	2	-	-	-	-	-	-	-	-	-
CO5	3	3	2	-	-	-	-	-	-	-	-	-
CO*	**3**	**3**	**2**	**-**	-	**-**	**2**	**-**	**-**	**-**	**2**	**-**

II B.Tech. - IV Semester

20HSM241	PRINCIPLES OF MANAGEMENT	L	T	P	C
		3	-	-	3

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

1. To understand the concepts of total quality management, and Contributions of TQM
2. To learn TQM principles and impact of 5s, Kaizen, PDSA cycles in continuous process improvement.
3. To study the basic need of quality control and process control in an organization
4. To learn the traditional and modern TQM tools and techniques
5. To study the quality standard, requirements and elements in Quality management system

UNIT I: INTRODUCTION TO MANAGEMENT (9)

Definition of management – Science or Art – Manager Vs Entrepreneur – Types of managers – Managerial roles and skills – Levels of management – Functions of management – Principles of management and Scientific Management and its approaches – Corporate Social Responsibilities – Organization culture and Environment.

UNIT II: PLANNING AND DECISION MAKING (9)

Planning: Nature and purpose of planning – Planning process – Types of planning –Objectives – Setting objectives – Policies – Planning premises – Strategic Management – Planning Tools and Techniques **Decision Making**: Importance of decision making – – Decision making steps and process.

UNIT III: ORGANIZING AND DIRECTING (9)

Organizing: Nature and purpose – Formal and informal organization – Organization chart and structure – Line and staff authority – Departmentalization – Delegation of authority – Centralization and decentralization – Job Design – HR planning, recruitment, selection, training and development, performance management, career planning and management. **Directing:** Principles of directing – Process of communication – Barrier in communication – Effective communication.

UNIT IV: CONTROLLING AND CO-ORDINATING (9)

System and process of controlling – Budgetary and non-budgetary control techniques – Use of computers and IT in Management control – Productivity problems and management – Control and performance – Direct and preventive control – Reporting.

UNIT V: MODERN CONCEPTS OF MANAGEMENT (9)

Concept, features, merits and demerits of SWOT Analysis, Business Process Re-engineering, Supply Chain Management – Concepts, functions importance of marketing – Competitive analysis and advantages of E-marketing.

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, students will be able to		POs
CO1	Understand the concepts of management, roles to be adopted by manager, functions of manager and inculcating the social responsibility towards different stake holders.	PO1, PO11
CO2	Demonstrate knowledge with regard to planning, planning process and the process of making effective decisions.	PO1, PO11
CO3	Demonstrate knowledge about organizational environment, the process of staffing and the application of directive principles.	PO1, PO11
CO4	Demonstrate knowledge about controlling and Co-ordinating	PO1, PO11
CO5	Demonstrate knowledge about modern concepts in management.	PO1, PO11

TEXT BOOKS:

1. Total Quality Management, Besterfield Dale H, Besterfield Carol, Besterfield Glen H, Besterfield Mary, Urdhwareshe Hemant and Urdhwareshe Rashmi, 5/e, 2018, Pearson Education, New Delhi.
2. Principles of Management, "M. Govindarajan and S. Natarajan", Prentice Hall of India Pvt. Ltd.

REFERENCE BOOKS:

1. Management, "Stephen P. Robbins and Mary Coulter", Prentice Hall of India, 8/e,
2. Principles of Management, "Charles W.L Hill, Steven L McShane", 2007, McGraw Hill
3. Education, Special Indian Edition.
4. Management-A Competency Based Approach, "Hellriegel, Slocum and Jackson", Thomson South Western, 10/e, 2007.
5. Management - A global and Entrepreneurial Perspective, "Harold Koontz, Heinz Weihrich and Mark V Cannice", Tata McGraw Hill, 12/e, 2007.
6. Essentials of Management, "Andrew J. Dubrin", Thomson South western. 7/e, 2007.

REFERENCE WEBSITE:

1. https://nptel.ac.in/courses/110/105/110105146/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO.1	3	-	-	-	-	-	-	-	-	-	2	-
CO.2	3	-	-	-	-	-	-	-	-	-	2	-
CO.3	3	-	-	-	-	-	-	-	-	-	2	-
CO.4	3	-	-	-	-	-	-	-	-	-	2	-
CO.5	3	-				-	-	-	-	-	2	-
CO*	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

II B.Tech. - IV Semester

20CIV241 DESIGN OF REINFORCED CONCRETE STRUCTURES L T P C
2 1 - 3

PRE-REQUISITES: A Course on strength of materials

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To familiarize the basic concepts of RCC design.

CEO2: To design the beams by LSA method.

CEO3: To Develop the skills required to analyze and design the columns.

CEO4: To understand and design concrete footings.

CEO5: To Analyze and Design of Slabs under various conditions.

UNIT I: BASIC CONCEPTS (9)

Introduction- Structure - Components of structure - Different types of structures - Equilibrium and compatibility– Safety and Stability - Loads – Different types of Loads – Dead Load, Live Load, Earthquake Load and Wind Load– Forces – What is meant by Design? – Different types of materials – RCC, PSC and Steel – Planning of structural elements-Concepts of RCC Design –Introduction to Working stress method - Limit State method– Material Stress- Strain Curves – Safety factors – Characteristic values. Stress Block parameters – IS – 456 –2000. Limit state analysis and design of Singly Reinforced, Doubly reinforced – IS: 456 – 2000.

UNIT II: BEAMS (9)

Beams: Limit state analysis and design of T and L Beam sections. Shear, Torsion and Bond: – concept anchorage and development length, I.S-Code provisions.Design examples in simply supported and continuous beams-detailing of reinforcement, design of canopy.

UNIT – III: SLABS (9)

Design of Two-way slabs with different end conditions, one way slab and continuous slab Using IS Coefficients. Concept of flat slab-Limit state design for serviceability for deflection, cracking and codal provision. Design of doglegged staircase.

UNIT IV: COLUMNS (9)

Design of compression members - Short Column - Columns with axial loads, uni-axial and bi-axial bending – Use of design charts- Long column – Design of long columns - I S Code provisions.

UNIT V: FOOTINGS (9)

Footings: Different types of footings – Design of isolated, square, rectangular, circular footings and combined footings.

Total Hours: 45

NOTE: All the designs to be taught in Limit State Method

Following details should be prepared by the students.

1. Reinforcement particulars of T-beams and L-beams.
2. Reinforcement detailing of continuous beams.
3. Reinforcement particulars of columns and footings.
4. Detailing of One way, two way and continuous slabs

COURSE OUTCOMES:

Upon completion of this course, the student will be able to:		POs related to COs
CO1	Demonstrate the Basic Concepts of Reinforced Concrete Analysis and Design.	**PO1, PO2 ,PO3**
CO2	Analysis and Design of various Reinforced Concrete Beams by LSD	**PO1, PO2, PO3,**
CO3	Analyse and Design of Reinforced Concrete member Columns under uniaxial and bi axial bending.	**PO1, PO2, PO3,**
CO4	Analyse and Design of Reinforced Concrete footing	**PO1, PO2, PO3**
CO5	Analyze and Design of Slabs under various conditions and design of staircases.	**PO1, PO2,PO3,**

TEXT BOOKS:

1. Reinforced concrete design by S. UnnikrishnaPillai&DevdasMenon, Tata McGrawHill, New Delhi.
2. Design of Reinforced Concrete Structures by K.Subramanian, Oxford University press, India.
3. Reinforced concrete design by N. Krishna Raju and R.N. Pranesh, New age International Publishers, New Delhi

REFERENCES:

1. Design of RCC Structures by M.L.Gambhir P.H.I. Publications, New Delhi.
2. Limit State Design of RCC Structures – P.C.Varghese, Prentice Hall of India, New Delhi
3. Structural Design and Drawing by N. Krishna Raju, University Press, Hyderabad.
4. Limit State Design of Reinforced Concrete by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Laxmi, publications Pvt. Ltd., New Delhi

REFERENCE WEBSITES:

https://nptel.ac.in/courses/105/105/105105105/

- Codes/Tables: IS 456-2000 and IS-800 code book to be permitted into the Examination Hall.

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	2	-	-	-	-	-	-	-	-	-
CO2	2	3	2	-	-	-	-	-	-	-	-	-
CO3	2	3	2	-	-	-	-	-	-	-	-	-
CO4	2	3	2	-	-	-	-	-	-	-	-	-
CO5	2	3	2	-	-	-	-	-	-	-	-	-
CO*	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

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II B.Tech. - IV Semester

20CIV242	GEOLOGY FOR CIVIL ENGINEERING	L T P C 3 0 - 3

PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES:

CEO1: Branches of geology and their importance in civil engineering works
CEO2: Weathering, geological classification of soils and soil erosion and conservation.
CEO3: Identification and study of minerals, rocks-rock as a construction material
CEO4: Geological structures and their role in civil engineering project
CEO5: Earthquakes, landslides causes and preventive measures

UNIT– I: INTRODUCTION (9)

WEATHERING OF ROCKS: Its effect over the properties of rocks importance of weathering with reference to dams, reservoirs and tunnels weathering of common rock like "Granite"

MINERALOGY: Definition of mineral, Importance of study of minerals, Different methods of study of minerals. Advantages of study of minerals by physical properties. Role of study of physical properties of minerals in the identification of minerals. Study of physical properties of following common rock forming minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite Garnet, Talc, Calcite. Study of other common economics minerals such as Pyrite, Hematite, Magnetite, Chlorite, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite.

UNIT – II: PETROLOGY (9)

DEFINITION OF ROCK: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common structures and textures of Igneous. Sedimentary and Metamorphic rocks. Their distinguishing features, Megascopic study of Granite, Dolerite, Basalt, Pegmatite, Laterite, Conglomerate, Sandstone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

STRUCTURAL GEOLOGY: Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults unconformities, and joints – their important types. Their importance In-situ and drift soils, common types of soils, their origin and occurrence inIndia

UNIT – III: GROUND WATER, EARTH QUAKE &LANDSLIDES (9)

Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration. Earth quakes, their causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Landslides, their causes and effect; measures to be taken to prevent their occurrence. Importance of study of ground water, earthquakes and landslides.

UNIT –IV: GEOPHYSICAL STUDIES (9)

Importance of Geophysical studies Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric methods and Geothermal method. Special importance of Electrical resistivity methods, and seismic refraction methods. Improvement of competence of sites by grouting etc.

UNIT – V: GEOLOGY OF DAMS, RESERVOIRS AND TUNNELS (9)

Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factor's Contributing to the success of a reservoir. Geological factors influencing water tightness and life of reservoirs. Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (i.e., Tithological, structural and ground water) in tunneling over break and lining in tunnels.

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course, Students will be able to		POs related to COs
CO1	Understand the basics of minerals ,types and properties	PO1,PO2
CO2	Understand the basics of rocks ,types, properties and structural geology	PO1,PO2
CO3	Understand the basics of ground water movement impacts of earth quake ,effects of earth quake and land slides	PO2,PO3
CO4	Understand the basics of geo physical methods and importance	PO2,PO3
CO5	Understand the Geological Considerations in the selection of a dam site., reservoir and tunnel	PO2,PO3,PO6

TEXTBOOKS:

1. N.Chennkesavulu," Engineering Geology" , Mc-Millan, India Ltd.2005
2. VasudevKanthi," Engineering Geology", Universities Press,Hyderabad.

REFERENCES:

1. Duggal.S.K," Engineering Geology", TMHPublishers.
2. SubinoyGangopadhyay," Engineering Geology ", Oxford UniversityPress.
3. Prabin Singh," Engineering Geology", KatsonPubilcations
4. K.V.G.K. Gokhale ,"Principals of Engineering Geology"– B.Spublications

REFERENCE WEBSITES:

https://nptel.ac.in/courses/105/105/105105106/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	3	-	-	-	-	-	-	-	-	-	-
CO2	2	3	-	-	-	-	-	-	-	-	-	-
CO3	-	2	3	-	-	-	-	-	-	-	-	-
CO4	-	2	3	-	-	-	-	-	-	-	-	-
CO5	-	2	2	-	-	1	-	-	-	-	-	-
CO*	**2**	**2.4**	**2.66**	-	-	**1**	-	-	-	-	-	-

II B.Tech. - IV Semester

20CIV243	HIGHWAY ENGINEERING	L T P C
		2 1 - 3

PREREQUISITES: Surveying I, Surveying II

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To Know about the history of highway development, surveys, alignment
CEO2: To Study about the geometric design of highways
CEO3: To Know about the pavement materials and design
CEO4: To Know about the construction materials and practices
CEO 5: To Expose the students to Highway Maintenance and Drainage.

UNIT I: HIGHWAY DEVELOPMENT AND PLANNING (9)

Highway development in India – Necessity for Highway Planning- Different Road Development Plans-Classification of Roads- Road Network Patterns – Highway Alignment- Factors affecting Alignment- Engineering Surveys –Drawings and Reports.

UNIT II: HIGHWAY GEOMETRIC DESIGN (9)

Importance of Geometric Design- Design controls and Criteria- Highway Cross Section Elements- Sight Distance Elements- Stopping sight Distance, Overtaking Sight Distance and intermediate Sight Distance- Design of Horizontal Alignment- Design of Super elevation and Extra Widening-Design of Transition Curves-Design of Vertical Alignment-Gradients- Vertical curves

UNIT III: HIGHWAY CONSTRUCTION MATERIALS AND PRACTICE (9)

Highway construction materials, properties, testing methods – CBR Test for subgrade - tests on aggregate & bitumen – Construction practice including modern materials and methods,Bituminous and Concrete road construction- Quality control measures - Construction machineries.

UNIT IV: DESIGN OF PAVEMENTS (9)

Types of Pavements – Differences between Flexible & Rigid pavements–Functions of pavement components – Design factors – Flexible pavement design methods – CBR method – Numerical examples – Design of Rigid Pavements – Wheel load stresses –Westergaard's stress equations – Stresses in rigid pavements – temperature stresses.

UNIT V: HIGHWAY MAINTENANCE AND DRAINAGE (9)

Need for highway maintenance- Pavement failures Flexible pavement failures and rigid pavement failure – Maintenance of highways –pavement evaluation – Importance of highway drainage –surface and subsurface drainage -cross drainage –road construction in waterlogged areas.

Total Hours: 45

COURSE OUTCOMES:

On successful completion of the course the student will be able to,		POs
CO1	Acquire knowledge about the gradients patterns of road network, engineering surveys and apply them	PO1, PO2, PO3
CO2	Identify appropriate method and design OSD ISD SSD for roads and vertical and horizontal alignments	PO1, PO2, PO3, PO5
CO3	Identify appropriate method and design various types of pavements and advantages and disadvantages, selecting suitable pavement based on conditions	PO1, PO2, PO3, PO5
CO4	Investigate different materials available, testing procedure, codal provisions and construction methods	PO1, PO2, PO4
CO5	Acquire knowledge about the Highway maintaince and causes and remedies for pavement failures drainage conditions	PO1

TEXTBOOKS:

1. S.K.Khanna&C.E.G.Justo," Highway Engineering" Nemchand& Bros., 7th edition (2000).
2. S.P.Chandola,"A Textbook of Transportation Engineering" S.Chand Publications, New Delhi.

REFERENCES:

1. S.P.Bindra," Highway Engineering", DhanpatRai& Sons. – 4th Edition (1981)
2. Dr.L.R.Kadyali ,"Traffic Engineering & Transportation Planning" Khanna publications – 6thEdition – 1997.
3. L.R.Kadiyali and Lal ,"Highway Engineering Design", Khanna Publications

REFERENCE WEBSITES:

https://nptel.ac.in/courses/105/101/105101087/

https://nptel.ac.in/courses/105/104/105104098/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	3	-	-	-	-	-	-	-	-	-
CO2	2	3	3	-	2	-	-	-	-	-	-	-
CO3	3	2	3	-	2	-	-	-	-	-	-	-
CO4	2	3	-	2	-	-	-	-	-	-	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-
CO*	**2.4**	**2.5**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

II B.Tech. - IV Semester

20CIV244	ADVANCED SURVEYING	L T P C 0 1 2 2

PRE-REQUISITES: A Course on surveying I

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To ensure that the student develops knowledge in the theodolite surveying

CEO 2: To acquire the knowledge on tachometric surveying

CEO 3: acquire the knowledge on triangulation surveying

CEO4: To acquire knowledge on Setting out of curves from the field measurements

CEO5: Basic knowledge on remote sensing

UNIT-I: THEODOLITE SURVEYING (9)

Vernier Theodolite: Basic definitions; Fundamental lines and desired relations; Temporary adjustments; Measurement of a horizontal angle; Repetition and Reiteration methods of horizontal angle measurement. Measurement of vertical angle; Sources of errors in Theodolite survey.

Theodolite Surveying

1. Study of theodolite in detail – practice for measurement of horizontal and vertical angles.
2. Measurement of horizontal angles by method of repetition and reiteration.

UNIT-II: TRIGONOMETRIC LEVELLING (9)

Introduction; Determination of the level of the top of an object, When its base is accessible and When its base is not accessible; Determination of the height of the object when the two instrument stations are not in the same vertical plane.

Trigonometrical Leveling (Heights & Distances problems)

1. Base of the object is accessible
2. Base of the object inaccessible

UNIT-III: TACHEOMETRIC SURVEYING (9)

Definition, Advantages of Tacheometric surveying Basic systems of tacheometric measurement, Principle of stadia measurements, Determination of constants K and C, Inclined sight with staff vertical; Inclined sight with staff normal to the line of sight, Movable hair method, Tangential method, Subtansebar,Errors in Tacheometry.

Tacheometric Surveying

1. Determination of tacheometric constants
2. Determination of the horizontal distances and vertical heights by using tangential tachometry.

UNIT-IV: CURVES (9)

Simple curves–Definitions and Notations, designation of a curve, Elements ofsimple curves,location of tangent points, selection of peg interval, Methods of setting simple curves (based on equipment) – Rankine's method, Two theodolite method. Compound curves – Elements of compound curve, setting out compound

curve. Reverse curves – Elements of reverse curve, relationship between various elements.

Setting Out Works

1. Setting out the simple circular curve by using offsets from the long chord method.
2. Setting out the simple circular curve by using Rankine's method.
3. Setting out the foundation trench of a building/culvert.

UNIT-V: ELECTRONIC DISTANCE MEASUREMENTS (9)

Introduction, Basic concepts of electromagnetic waves, basic definitions, phase of the wave, units, types of waves; distance from measurement of transit time, Computing the distance from the phase differences, EDM instruments, Features of total station, Setting up and orienting a total station, on-board software-Electronic data recording, Summary of total station characteristics, Field procedures for total station in topographic survey.

Exercises Using Electronic Total station

1. Determination of remote height/elevation.
2. Missing line measurement.
3. Determination of gradient of a line joining two inaccessible points.
4. Determination of area of a given traverse.

Total Hours:45

COURSE OUTCOMES:

On successful completion of the course the student will be able to		POs related to COs
CO1	Demonstrate the knowledge on theodolite, tacheometer and EDM surveying and curves.	PO1, PO2,PO5
CO2	Solve complex problems through Tacheometric surveying	PO1, PO2, PO3, PO4
CO3	Analyze surveying techniques to set out various works	PO1, PO2, PO3,
CO4	Design different types of curves	PO1, PO2
CO5	Describe different modern instruments used in surveying	PO1, PO3

TEXTBOOKS:

1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain," Surveying (Vol – II)",– Laxmi publications (P)Ltd., New Delhi
2. C.Venkataramaiah ,"Text book of surveying", UniversitiesPress.
3. Dr. K. R. Arora," Surveying Vol. II", Standard BookHouse;
4. Chandra ,"Higher Surveying" , New agePublishers.

REFERENCES:

1. S.K. Duggal," Surveying Vol. II". Tata Mc. Graw Hill PublishingCo.
2. SatheeshGopi, R.Shanta Kumar and N.Madhu," Advanced Surveying" Pearsoneducation
3. Mahajan, SanthosK.,"Advanced Surveying"DhanpatRai& Sons, NaiSarak, Delhi,1987.

REFERENCE WEBSITE:

https://nptel.ac.in/courses/105/104/105104101/
https://nptel.ac.in/courses/105/107/105107122/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	2	-	-	1	-	-	-	-	-	-	-
CO2	2	2	1	1	-	-	-	-	-	-	-	-
CO3	2	2	1	-	-	-	-	-	-	-	-	-
CO4	2	2	-	-	-	-	-	-	-	-	-	-
CO5	2	-	2	-	-	-	-	-	-	-	-	-
CO*	**2**	**2**	**1.33**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

II B.Tech. - IV Semester

20CIV245 ENGINEERING GEOLOGY LABORATORY

L	T	P	C
-	-	3	1.5

PRE-REQUISITES: Engineering Geology

COURSE EDUCATIONAL OBJECTIVES:

CEO1: To impart working knowledge of minerals,

CEO2: To impart working knowledge of minerals rocks and

CEO3: To impart working knowledge of minerals geological maps for civil engineering projects.

List of Experiments:

1. Megascopic identification of minerals.
2. Megascopic identification of common igneous rocks.
3. Megascopic identification of common sedimentary rocks.
4. Megascopic identification of common metamorphic rocks.
5. Structural geology problems.
6. Study and interpretation of geological maps.

COURSE OUTCOMES:

On successful completion of the course the student will be able to,		POs related to COs
CO1	Apply the knowledge on identification of minerals and rocks, structural geology problems and maps and geophysical studies	PO1
CO2	Analyze different minerals, rocks, geophysical data for engineering applications. Interpret the geological maps and geophysical data with emphasis on practical applications in civil engineering	PO2
CO3	Follow the ethical principles while doing the experiments	PO8
CO4	Do the experiments effectively as an individual and as a team member in a group.	PO9
CO5	Communicate verbally and in written form pertaining to results of the experiments	PO10
CO6	Continue updating their skill related to geology in future.	PO12

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-	3	-	-	-	-
CO4	-	-	-	-	-	-	-	-	3	-	-	-
CO5	-	-	-	-	-	-	-	-	-	3	-	-
CO6	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	-	-	-	-	-	**3**	**3**	**3**	-	**3**

II B.Tech. - IV Semester

20CIV246 HYDRAULIC MACHINERY LABORATORY L T P C
0 0 3 1.5

COURSE EDUCATION OBJECTIVES:

CEO 1:To understand the impact jet on vanes
CEO 2:To study the hydraulic jump
CEO 3:To study the characteristics of turbines
CEO 4:To study the characteristics of pumps

LIST OF EXPERIMENTS:

1. Impact of jet on vanes.
2. Study of Hydraulic jump.
3. Performance test on Pelton wheel turbine
4. Performance test on Kaplan turbine
5. Performance test on single stage centrifugal pump
6. Performance test on single stage centrifugal pump
7. Performance test on Reciprocating pump.
8. Performance test on Francis turbine performance.

COURSE OUTCOMES:

On successful completion of the course, Students will be able to		POs related to COs
CO1	Explain the practical knowledge about on handling various instruments like turbine, pumps	PO1
CO2	Understand the concept of each equipment including turbine, pumps	PO2
CO3	Describe the parameter of knowledge in the area of flow measurement and efficiency of pump and turbine	PO3
CO4	Conduct the experiment and interpret data for solving the design problems	PO4
CO5	Develop characteristics of pumps and turbines.	PO5
CO6	Follow the ethical principles while doing the experiments	PO8
CO7	Do the experiments effectively as an individual and as a team member in a group.	PO9
CO8	Communicate verbally and in written form pertaining to results of the experiments	PO10
CO9	Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.	PO12

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	-	-	-	-
CO7	-	-	-	-	-	-	-	-	3	-	-	-
CO8	-	-	-	-	-	-	-	-	-	3	-	-
CO9	-	-	-	-	-	-	-	-	-	-	-	3
CO*	**3**	**3**	**3**	**3**	**3**	-	-	**3**	**3**	**3**	-	**3**

II B.Tech. - IV Semester

20CIV247 BASIC CIVIL ENGINEERING LAB L T P C
0 0 3 1.5

COURSE EDUCATION OBJECTIVES:

CEO 1: To understand the marking of buildings.
CEO 2: To gain the knowledge in construction of brick walls.
CEO 3: To gain the idea on plastering process.
CEO 4: To gain the idea about the painting process.
CEO 5: To understand the preparation of Cover blocks
CEO 6: To understand and preparation of Flyash blocks

LIST OF EXPERIMENTS:

1. Setting out of a building: The student should set out a building (single room only) as per the given building plan using tape only.
2. Setting out of a building: The student should set out a building (single room only) as per the given building plan using tape and cross staff.
3. Construct a wall of height 50 cm and wall thickness 1½ bricks using English bond (No mortar required) - corner portion – length of side walls 60 cm.
4. Construct a wall of height 50 cm and wall thickness 2 bricks using English bond (No mortar required) - corner portion – length of side walls 60 cm.
5. Computation of Centre of gravity and Moment of inertia of a given rolled steel section by actual measurements.
6. Installation of plumbing and fixtures like Tap, T-Joint, Elbow, Bend, Threading etc;
7. Plastering and Finishing of wall
8. Application of wall putty and painting a wall
9. Application of base coat and lying of Tile flooring of one square meter
10. Preparation of soil cement blocks for masonry and testing for compressive strength
11. Casting and testing of Fly ash Blocks
12. Preparation of cover blocks for providing cover to reinforcement

COURSE OUTCOMES:

On successful completion of the course, Students will be able to		POs related to COs
CO1	Explain the practical knowledge about foundation marking of buildings.	PO1
CO2	Understand the concept of construction of brick walls.	PO2
CO3	Describe the parameter of knowledge in the area of flooring and plastering.	PO3
CO4	Conduct the experiment and interpret data for solving the design problems	PO4
CO5	Develop characteristics of building components.	PO5
CO6	Follow the ethical principles while doing the experiments	PO8
CO7	Do the experiments effectively as an individual and as a team member in a group.	PO9
CO8	Communicate verbally and in written form pertaining to results of the experiments	PO10

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	-
CO2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	-	-	3	-	-	-	-	-	-	-	-	-
CO4	-	-	-	3	-	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-
CO6	-	-	-	-	-	-	-	3	-	-	-	-
CO7	-	-	-	-	-	-	-	-	3	-	-	-
CO8	-	-	-	-	-	-	-	-	-	3	-	-
CO*	**3**	**3**	**3**	**3**	**3**	-	-	**3**	**3**	**3**	-	-

II B.Tech. – IV Semester

20MAC231	ENVIRONMENTAL SCIENCE (COMMON TO ALL BRANCHES)	L T P C
		2 - - -

PRE-REQUISITES: NIL

COURSE EDUCATIONAL OBJECTIVES:

CEO 1: To recognize nature of environmental studies and various renewable and nonrenewable resources.

CEO 2: To understand flow and bio-geo- chemical cycles and ecological pyramids.

CEO 3: To identify various causes of pollution and solid waste management and related preventive measures.

CEO 4: To evaluate and interpret the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.

CEO 5: To understand the causes of population explosion, value education and welfare programmes.

UNIT - I: INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES (6)

Multidisciplinary nature of environmental studies: Definition, scope and importance. Need for public awareness.

Natural Resources: Renewable and non-renewable resources: Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and nonrenewable energy resources.

UNIT – II: CONCEPT OF ECOSYSTEM AND BIODIVERSITY (6)

Structure and function of an ecosystem: Producers, consumers and decomposers- Energy flow in the ecosystem- Ecological succession- Food chains, food webs and ecological pyramids- Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and its conservation: Introduction – Definition: genetic, species and ecosystem diversity-Biogeographical classification of India-Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels- India as a mega-diversity nation-Hot-sports of biodiversity-Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. -Endangered and endemic species of India -Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

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UNIT – III: ENVIRONMENTAL POLLUTION AND WASTE MANAGEMENT (6)

Environmental Pollution: Definition - Cause, effects and control measures of: - a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial wastes-Role of an individual in prevention of pollution. Pollution case studies-Disaster management: floods, earthquake, cyclone and landslides.

UNIT – IV: SOCIAL ISSUES AND THE ENVIRONMENT (6)

From Unsustainable to Sustainable development: Urban problems related to energy Water conservation, rain water harvesting, watershed management-Resettlement and rehabilitation of people; its problems and concerns. -Environment Protection Act-Air (Prevention and Control of Pollution) Act-Water (Prevention and control of Pollution) Act-Wildlife Protection Act- Forest Conservation Act -Issues involved in enforcement of environmental legislation-Public awareness**.**

UNIT – V: HUMAN POPULATION AND THE ENVIRONMENT (6)

Population growth: variation among nations-Population explosion – Family Welfare Programme-Environment and human health-Human Rights-Value Education-HIV/AIDS. Women and Child Welfare-Role of Information Technology in Environment and human Case Studies.

Total hours: 30

COURSE OUTCOMES:

On successful completion of the course, students will be able to		**Pos**
CO1	Grasp multidisciplinary nature of environmental studies and various renewable and nonrenewable resources.	**PO1, PO2, PO3 PO4, PO5, PO6,PO7**
CO2	Understand flow and bio-geo- chemical cycles and ecological pyramids.	**PO1, PO2, PO3 PO4, PO5, PO6,PO7**
CO3	Understand various causes of pollution and solid waste management and related preventive measures.	**PO1, PO2, PO3 PO4, PO5, PO6,PO7**
CO4	Understand concept of rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.	**PO1, PO2, PO3 PO4, PO5, PO6,PO7**
CO5	Causes of population explosion, value education and welfare programmes.	**PO1, PO2, PO3 PO4, PO5, PO6,PO7**

TEXT BOOKS:

1. R. Rajagopalan," Environmental Studies" , Oxford University Press.
2. Gilbert M. Masters and Wendell P. Ela. 2008,"Environmental Engineering and science" PHI Learning Pvt. Ltd

REFERENCE BOOKS:

1. ErachBharucha "Textbook of Environmental Studies for Undergraduate Courses", University grants commission, 2/e,2013.
2. C.P.Kaushik and Anubhakaushik "Text book of environmental studies", New age International publishers, 4/e,2006.

REFERENCE WEBSITE:

https://nptel.ac.in/courses/127/105/127105018/

https://nptel.ac.in/courses/113/104/113104061/

https://nptel.ac.in/courses/120/108/120108005/

https://nptel.ac.in/courses/120/108/120108002/

CO\PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	2	2	2	3	-	-	-	-	-
CO2	3	2	1	2	2	2	3	-	-	-	-	-
CO3	3	2	1	2	2	2	3	-	-	-	-	-
CO4	3	2	1	2	2	2	3	-	-	-	-	-
CO5	3	2	1	2	2	2	3	-	-	-	-	-
CO*	**3**	**2**	**1**	**2**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**