ACADEMIC REGULATIONS,

COURSE STRUCTURE

AND

DETAILED SYLLABII OF

B.Tech - Civil Engineering I & II year

A-20 REGULATION

DEPARTMENT OF CIVIL ENGINEERING
SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
(An Autonomous Institution approved by UGC and affiliated to JNTUH)
Yamnampet, Ghatkesar, Hyderabad - 501 301

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B. Tech (Civil Engineering)

Program objective:

B. Tech in Civil Engineering program prepares the graduates with necessary knowledge, skills, and tools to analyze, plan and design solutions for basic Civil Engineering problems covering the domains of structures, transportation, surveying, and water resources and hydraulic systems with awareness to environmental preservation and sustainable development.

The first two years of this program have a set of introductory courses, such as Mathematics, Physics, English, Computer Languages (C, C++, Java), Technical Seminars, providing the students with a firm foundation in mathematics, physical sciences, computer languages, and communication skills. These courses include weekly labs in which students use state-of-the art equipment and software tools to analyze and solve practical engineering problems.

The last two years of the program focus on the core civil engineering subjects covering the concepts and techniques used in the analysis, design and development of practical civil engineering problems including investigative and solution tools.

In addition, students can choose from a set of professional elective streams covering various specialized domains in civil engineering. These advanced courses give broad opening for research and help students when they pursue higher studies in that stream. A generous allotment of open elective streams allows students to learn in-demand skills such as data base management systems, advanced managerial techniques, foreign languages etc.

Having completed the course, the student is well prepared to perform independently within a structured professional framework or pursue higher studies.

DEPARTMENT OF CIVIL ENGINEERING

VISION

Become a reputed department for Civil Engineering education and research in the country with focus on producing technically skilled, professionally competent, and socially responsible engineers with attention to sustainable development and life long learning capabilities to take on the challenges of the ever changing world.

MISSION

1. To empower the students by providing them academic environment to pursue and attain competencies in Civil Engineering undergraduate studies.
2. To develop liaison with academia, R&D institutions and Civil Engineering industry for hands-on training of the students to solve real life Civil Engineering problems in service to the society.
3. To inculcate interpersonal skills, team work, leadership qualities and professional ethics in students which will enhance their competencies.

4. To enable the students to pursue higher studies and conduct research activities which will help them in developing life-long learning and successful professional career.

Programme Educational Objectives:

I. Graduates will have a strong foundation in fundamentals of mathematics, natural and environmental sciences, and basic engineering skills with abilities of problem analysis, design and development of optimal solutions to engineering problems.

II. Graduates can apply the knowledge of theory, tools of investigation, and use of modern tools to solve complex problems and become professionally competent and globally employable engineers to assess health, safety, legal, societal, and environmental and sustainable issues maintaining ethical principles.

III. Graduates will have ability to work effectively as an individual, a team member, a leader or an entrepreneur with awareness of gender sensitiveness apart from having good communication, project and finance management skills.

IV. Encouraging the graduates to pursue higher studies in internationally reputed institutes or research and development activities thus making them life-long learners.

Programme Outcomes

The Programme Outcomes (**POs**) of the B.Tech (Civil Engineering) programme are listed below:

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and specialization of CivilEngineering to the solution of complex engineering problems.

2. **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.

3. **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.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods in the area of Civil Engineering including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools useful for Civil Engineering and related areas including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

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

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication:** Communicate effectively on complex Civil 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.

11. **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 finalize technical and financial aspects of a project and to manage in multidisciplinary environments.

12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological changes through individual/group assignments such as technical seminars, lab projects, group projects, mini and main projects in the area of Civil Engineering or in multi disciplinary areas.

Correlation between the POs and the PEOs

PEOs	Programme Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
I	✓	✓	✓	✓								
II			✓	✓	✓	✓	✓	✓				
III								✓	✓	✓	✓	
IV							✓					✓

Program Specific Objectives (PSOs):

1. Develop a strong foundation of basic sciences and its applications for Civil Engineering Problems, apply the concepts of analysis and investigation using modern tools to design and solve Civil Engineering problems. *[CORE]*
2. Possess professional skills to investigate, analyze, and design practical solutions to Civil Engineering problems such as basic structures design, basic water conveyance and treatment systems design, basic transportation systems design, and basic survey maps and building drawings development, etc. [*Practical*]
3. Comprehend and apply technological advancements for real life engineering problems using modern instruments and modern analytical and software tools to analyze, plan, design, and implement solutions. [*Tools*]
4. Possess skills to communicate, be a team member, demonstrate professional ethics and exhibit concern for societal and environmental wellbeing for sustainable professional development. *[ENV, Team, Society and Lifelong learning, professional]*

ACADEMIC REGULATIONS
FOR B.TECH. REGULAR STUDENTS
WITH EFFECT FROM
THE ACADEMIC YEAR 2020-21
(A-20)

1.0 Under-Graduate Degree Programme in Engineering & Technology (E&T)

1.1 SNIST offers a 4-year (8 semesters) **Bachelor of Technology** (B. Tech.) degree programme, under Choice Based Credit System (CBCS) with effect from the academic year 2020-21 in the following branches of Engineering.

Sl. No.	Branch
1.	Civil Engineering
2.	Electrical and Electronics Engineering
3.	Mechanical Engineering
4.	Electronics and Communication Engineering
5.	Computer Science and Engineering
6.	Information Technology
7.	Electronics and Computer Engineering

1.2. Credits (Semester system for B. Tech courses)

The existing credit system of giving one credit for a lecture hour/ tutorial hour per week and giving 0.5 credit for every hour of practical and drawing shall be continued in these regulations also.

2.0 Eligibility for admission

2.1 Admission to the Under Graduate courses shall be made either on the basis of the rank of the candidate in entrance test conducted by the Telangana State Government (EAMCET) or on the basis of any other order of merit approved by the University, subject to reservations as prescribed by the Government from time to time. However, admissions under Management / NRI Category shall be made on the relevant orders issued by the Govt. of Telangana from time to time.

2.2 The medium of instruction for the entire Under Graduate programme of study in E&T will be **English** only.

3.0 B. Tech. Programme structure

3.1 A student after securing admission shall pursue the Under Graduate programme in B. Tech. in a minimum period of **four** academic years (8 semesters), and a maximum period of **eight** academic years (16 semesters) starting from the date of commencement of first year first semester, failing which student shall forfeit seat in B. Tech course. However, the student can take two more years for appearing the examinations to clear the backlog subjects.

In the First year it is structured to provide **45 credits** and the credits in II , III and IV years should not exceed **119 credits** as per AICTE model curriculum for the B. Tech. programme. Each student shall secure **164 credits** (with CGPA $\geq$5) required for the completion of the Under Graduate programme and Award of B. Tech degree.

Each student shall secure **164 total credits** (with CGPA ≥ 5) for the completion of the Under Graduate programme for the award of the B.Tech. degree. However, any revision made in this regard and approved by the Academic Council of the college and by Parent University shall be implemented from the date of the revision.

3.2 **UGC/AICTE** specified definitions/ descriptions are adopted appropriately for various terms and abbreviations stated below.

3.2.1 Semester scheme

Each Under Graduate programme is of 4 academic years (8 semesters) with the academic year being divided into two semesters of 22 weeks (90 instructional days) each, each semester having - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'.

Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as indicated curriculum / course structure as suggested by AICTE are followed.

3.2.2 Credit courses

- A student in a semester has to earn credits which shall be assigned to each subject/ course in an L: T: P: C (lecture periods: tutorial periods: practical periods: credits) structure based on the following general pattern.
- One credit for one hour/ week offered in the entire semester for theory lecture (L) / Tutorial (T) courses.
- One credit for two hours/ week offered in the entire semester for laboratory/ practical (P) courses.
- The orientation course recommended by AICTE in the model curriculum is offered for 3 weeks and Cyber Security in III year as mandatory course.
- Environmental Engineering is offered mandatory course for B. Tech Mechanical Engineering and ECE students in II year.
- However, these courses will be reflected in the Memo of Marks, the grading will be awarded below, with some total of 100 marks with CIE for 30 marks and SEE for 70 marks.

% of Marks Secured in a Subject/Course	Letter Grade
Greater than or equal to 90%	O (Outstanding)
80 and less than 90%	A+ (Excellent)
70 and less than 80%	A (Very Good)
60 and less than 70%	B+(Good)
50 and less than 60%	B (Average)
40 and less than 50%	C (Pass)
Below 40%	F (FAIL)
Absent	Ab

- For mandatory courses i.e ., **Orientation Course** for B. Tech I year students to be taught for one week in I semester with Two Units and remaining Four Units in B. Tech. I year II semester and **Cyber Security** is offered as mandatory course for all the students of Civil, ME,EEE and will not have credits, but evaluation will be done as per the above table. A student cannot obtain degree unless he / she completes all the mandatory courses.

3.2.3 Subject Course Classification

All subjects / courses offered for the Under Graduate programme in E&T (B. Tech. Degree programmes) are broadly classified as follows. The Institution has followed all the guidelines issued by AICTE/UGC.

The groups of the subjects shall be as given in the table hereunder along with the credits suggested by AICTE. efforts are made by individual departments to make up the total credits equal to 164.

Sl. No.	Category	Suggested Breakup of Credits (Total 160)	CSE	ECE	CED	EEE	ME	IT	ECM
1	Humanities and social sciences including Management courses	12*	14	14	11	13	13	14	13
2	Basic Science including Mathematics courses	25*	22	23	29	30	24	22	26
3	Engineering Science courses including workshop, drawing, basic electrical /electronics mechanical course as well as various computer courses offered for Non – IT branches	24*	29	28	31	25	28	29	28
4	Professional core courses	48*	59	59	51	61	62	59	59
5	Professional Elective courses (five courses)relevant to chosen specialization / branch	18*	15	15	15	15	15	15	15
6	Open Electives(3 courses) offered by any other departments / MBA department **	18*	6	6	6	6	6	6	6
7	Project work, seminar and internship in industry or elsewhere	15*	19	19	21	14	16	19	17
8	Mandatory courses (Environmental Sciences, Induction training, Indian constitution, Essence of Indian Traditional Knowledge)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)	(Non-credit)
	Total	160*	164	164	164	164	164	164	**164**

The Joint Board of Studies and Academic Council of the institution has approved the total number of credits to be 164. The various groups of subjects mentioned above shall have credits suggested above with minor variations.

4.0 Course registration

4.1 A 'faculty advisor or counselor' shall be assigned to a group of 20 students, who will advise student about the under graduate programme, its course structure and curriculum, choice/option for Professional and open Electives based on their employment potential / further studies.

4.2 The student will progress semester after semester as the Institute is following cohort system to satisfying the conditions of promotion to the next semester.

4.3 **In the present system there shall be five subjects in each professional elective stream and three subjects in open elective stream.** A student can opt for a stream of professional/ open electives which should be submitted to the faculty Advisor/ Counselor and copy of it to the Examination Section through the Head of the department. A copy of it will be retained with the Head of the department/ faculty Advisor/ Counselor and the student.

4.4. **The student can take one extra subject in each semester and can complete the program in 3 ½ years but original degree will be issued along with his / her batch mates after 4 years.**

4.5. **If a student acquires 20 credits extra than the required credits as per the regulations he will be awarded honors.**

4.6 The purpose of offering Elective Streams in both Professional and Open Electives is to facilitate the students to have a minor specialization based on their interest, so that they will have multi disciplinary exposure. Hence, a student is to take a stream of Electives in either in Professional / Open Elective. He shall not be permitted to opt for other elective subjects in other streams in subsequent semesters.

4.7 Dropping of Electives may be permitted, only after obtaining prior approval from the faculty advisor / counselor, '**within a period of 15 days** from the beginning of the current semester.

5.0 Subjects / courses to be offered

5.1 A typical section (or class) nominal strength for each semester shall be 60.

5.2 A subject / course may be offered to the students, **only if** a minimum of **30 students** opt for it. The maximum strength of a section is limited to 80.

6.0 Attendance requirements:

6.1 A student shall be eligible to appear for the semester end examinations, if student acquires a minimum of 75% of attendance in aggregate of all the subjects / courses (excluding attendance in mandatory courses, Internship during II year, NCC / NSO and NSS) for that semester.

6.2 Shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be condoned by the college academic committee on genuine and valid grounds, based on the student's representation with supporting evidence.

6.3 A stipulated fee shall be payable towards condoning of shortage of attendance as decided by finance committee of SNIST from time to time.

6.4 Shortage of attendance below 65% in aggregate shall in **NO CASE** be condoned.

6.5 Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examinations of that semester.

They get detained and their admission for that semester shall stand cancelled.

They will not be promoted to the next semester. They may seek re-admission for all those subjects registered in that semester in which student was detained, by seeking re-admission into that semester as and when offered; in case if there are any professional electives and / or open electives, the same may also be re-registered if offered. However, if those electives are not offered in later semesters, then alternate electives may be chosen from the **same** set of elective subjects offered under that category. He will be governed by the new regulations in which he takes re-admission.

6.6 A student fulfilling the attendance requirement in the present semester shall not be eligible for readmission into the same semester.

7.0 Academic requirements

The following academic requirements have to be satisfied, in addition to the attendance requirements mentioned in item no.6.

7.1 **A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject / course, if student secures not less than 35% marks (24 out of 70 marks) in the semester end examination, and a minimum of 40% of marks in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of letter grades, this implies securing 'C' grade or above in that subject / course.**

7.2 A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to group projects, seminar, comprehensive test, viva-voce and major project. If a student secures not less than 40% marks (i.e. 40 out of 100 allotted marks) in each of them.

The student would be treated as failed, if student

(i) does not complete all the mandatory courses offered during the course
(ii) does not submit a report on internship, group project, major project, or does not make a presentation of the same before the evaluation committee as per schedule, or
(iii) does not present the seminar as required in the I year and II year or
(iv) secures less than 40% marks in comprehensive test and seminar/ comprehensive test and viva-voce / group project/major project evaluations.

Student may reappear once for each of the above evaluations, when they are scheduled again; if student fails in such 'one re-appearance' evaluation also, student has to reappear for the same in the next subsequent semester, as and when it is scheduled.

7.3 Promotion Rules based upon credits

S. No.	Promotion	Conditions to be fulfilled
1	First year First Semester to Second Semester	Regular course of study of first year first semester and should have satisfied the minimum requirement of attendance to appear I year I semester.
2	First year to second year first semester	i. Regular course of study of first year First and second semesters. ii. Must have secured at least 50% of credits (22) upto first year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.

3.	II Year I Semester to II Semester	Regular course of study of second year first semester.
4	Second year to third year first semester	i. Regular course of study of First and second semesters of second year. ii. Must have secured at least 60% of credits (54) upto second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Third year first semester to second semester	Regular course of study of third year first semester.
6	Third year second semester to fourth year first semester	i. Regular course of study of third year second semester. ii. Must have secured 60% of credits (79) up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
7	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

7.4 A student (i) shall attend for all courses / subjects covering 164 credits as specified and listed in the course structure, (ii) fulfils all the attendance and academic requirements for 164 credits, (iii) earn all 164 credits by securing SGPA $\geq$ 5.0 (in each semester), and CGPA (at the end of each successive semester) $\geq$ 5.0, (iv) **passes all the mandatory courses,** to successfully complete the under graduate programme. The performance of the student in these 164 credits shall be taken into account for the calculation of 'the final CGPA (at the end of under graduate programme), and shall be indicated in the grade card of IV year II semester.

7.5 If a student registers for some more **'extra subjects'** (in the parent department or other departments / branches of engineering) other than those listed subjects as specified in the course structure of his Department, the performances in those ' **extra subjects**' will not be taken into account while calculating the SGPA and CGPA. For such '**extra subjects'** registered, Percentage (%) of marks and letter grade alone will be indicated in the grade card as a performance measure, subject to completion of the attendance and academic requirements as stated in the regulations 6 and 7.1 to 7.4 above.

7.6 A student eligible to appear in the semester end examination for any subject / course, but absent from it or failed (thereby failing to secure **'C'** grade or above) has to reappear for that subject/ course in the supplementary examination as and when conducted. In such cases, CIE assessed earlier for that subject / course will be carried over, and added to the marks obtained in the supplementary examination for evaluating performance in that subject.

7.7 A student **detained in a semester due to shortage of attendance, may be re-admitted when the same semester is offered in the subsequent academic years for the fulfillment of academic requirements**.

The academic regulations under which student has been readmitted shall be applicable. However, no grade allotments or SGPA / CGPA calculations will be done for the entire semester in which student has been detained.

7.8 A student detained **due to lack of credits, will be promoted to the next academic year only after acquiring the required credits as per academic regulations.**

The academic regulations shall be applicable to a student whatever they are in force at the time of re-admission.

8.0 Evaluation - Distribution and weightage of marks

8.1 The performance of a student in each semester shall be evaluated subject-wise for a maximum of 100 marks for a theory and 100 marks for every practical subject with 30 marks Continuous Internal Evaluations (CIE) and 70 marks for Semester End Examinations (SEE)

Summer Break: Internship-I and Internship-II will be organized during summer vacation of II-II and III-II and evaluation of the same will be carried out during lab examinations of III-I and IV-I.

In addition, there will be Group Project-I in III year I semester, Group Project-II in III year II semester, and Group Project-III in IV year I semester, Major project in IV year II semester will be evaluated for 100 marks.

The pattern of continuous internal evaluation for Internship Project and Group Project is given below:

Sl. No	Description	Marks
1	Abstract, Design, implementation and Presentation in front of Project Review Committee consisting of HoD, Senior faculty and Internal guides (Average)	15 marks
2	Report	05 marks
3	Evaluation by Internal Guide	10 marks
	Total sessional marks	**30 marks**

Semester end examination - 70 marks

Pattern of external evaluation for Internship Project and Group Project.

Sl. No	Description	Marks
1	Final report	10 marks
2	Presentation	10 marks
3	Demonstration/defence of project	50 marks
	Total sessional marks	**70 marks**

Pattern of continuous internal evaluation for Major Project in IV year II semester is as follows:

Sl. No	Description	Marks
1	Progress of Project work and the corresponding interim report as evaluated by Project Review Committee at the end of 6 weeks	5 marks
2	Seminar at the end of 6 weeks	5 marks
3	Progress of Project work as evaluated by Project Review Committee at the end of 11 weeks	5 marks
4	Seminar at the end of 11 weeks	5 marks
5	Evaluation by Project Review Committee at the end of 15 weeks and Final Project Report	5 marks
6	Final presentation and defense of project	5 marks
	Total	**30 marks**

Pattern of External Evaluation for Major project - 70 Marks

Sl. No	Description	Marks
1	Final Project Report	10 marks
2	Presentation	20 marks
3	Demonstration / Defense of Project before committee	40 marks
4	**TOTAL**	**70 marks**

8.2 For all the other theory and lab subjects the distribution of marks shall be 30 for Continuous Internal Evaluation (CIE) and 70 for the Semester End-Examination (SEE).

8.3 Theory Subjects

8.3.1 Pattern for Continuous Internal Evaluation (CIE) 30 marks

The following procedure is to be adopted for awarding internal marks of 30 for all the B. Tech. students from the **Academic Year 2020-2021**

The distribution of marks for continuous internal evaluation (30 marks) is shown below. Average of two Mid Tests will be taken for final award of marks.

a)	**Part – A** of Mid Test will have 10 questions	5 marks
b)	**Part – B** of Mid Test will have 4 questions (1 from each unit and 4th question from any one unit or combination) and student has to answer 3 questions	15 marks
c)	**Part – C** Mid Test Question Paper Will have 3 questions – One from each unit taken from assignment questions. Student has to answer 1 question out of 3 questions	3 marks
d)	**Assignment– I** three questions from each unit (1,2,3 unit) – total of 9 questions to be submitted before first mid test. **Similarly assignment – II**: will have three questions from each unit (4, 5, 6 units) total of 9 questions will be submitted before Mid Test II and average of two assignments will be considered.	2 marks
e)	Attendance *	3 marks
f)	Class notes	2 marks
	Total	**30 marks**

* Three marks are awarded for each theory subject for the students who put in attendance in a graded manner as given below:

S. No.	Attendance Range	Marks Awarded
1.	65 % and above but less than 75%	1
2.	75% and above and less than 85%	2
3.	85% and above	3

Marks for attendance shall be added to each subject based on average of attendance of all subjects put together.

If any candidate is absent in any subject or mid-term examination, this student wishes to improve performance, a **third mid-test** will be conducted for that student by the Institution in the entire syllabus, on the same day of Semester End Examination (SEE) for $2^1/_2$ hours. That result will be treated as III mid test and average of better two of (mid test I,II,III) will be considered. III mid test

will have Part-A (compulsory) and Part-B with essay type questions and three out of four questions are to be answered.

b) Pattern for External Examinations - (70 marks)

- There shall be external examination in every theory course and consists of two parts (Part-A & Part-B). The total time duration for this semester end examination will be 3 hours.

- **Part-A** shall have 20 marks, which is compulsory. It will have 10 short questions set with 2 marks each. There shall be atleast one question to each of the six units and two questions from units 1,2,3 and two questions from unit 4,5,6 and number of questions from any unit shall not exceed two.

- **Part-B** of the question paper shall have essay type questions for 50 marks and shall have 8 questions out of which any 5 are to be answered. At least one question must appear from each Unit. Seventh question must have 2 to 3 bits taken from 1st, 2nd, and 3rd units and 8th question also with 2 to 3 bits taken from 4th, 5th and 6th units, such that not more than 2 questions shall be from any one unit. All the questions carry equal marks.

8.4 Pattern of Evaluation for Lab subjects - (100 marks)

8.4.1 For practical subjects there shall be a continuous evaluation during the semester for 30 sessional marks and 70 marks for semester end examination. Out of the 30 marks for Continuous Internal Evaluation, the distribution of marks is as follows

S. No	Item	Marks
1.	Day to Day work	05 marks
2.	Final Record and viva	09 marks
3.	Average of two tests including viva	05 marks
4.	Lab Based Project Report viva and demo	08 marks
5.	Attendance	03 marks
	Total	**30 marks**

8.4.2 The semester end examination for 70 marks for the lab subjects shall be conducted by an external examiner and an internal examiner appointed by the Chief Superintendent of Examinations of the college. The marks are distributed as follows:

S. No	Item	Marks
1.	Procedure to experiment and Tabulation	10 marks
2.	Conduct of experiment, observation, Calculation	30 marks
3.	Results including graphs, discussions and conclusion	20 marks
4.	Viva voce and Record	10 marks
	Total	70 marks

8.4.3 In case computer based examinations

S. No	Item	Marks
1.	Flow chart and algorithms	10 marks
2.	Program writing and execution	30 marks
3.	Result and conclusions	20 marks
4.	Viva voce and Record	10 marks
	Total	70 marks

8.5 **For the subject having design and / or drawing, (such as Engineering Drawing and Machine Drawing), the distribution shall be 30 marks for internal evaluation (10 marks for day-to-day work including drawing,3 marks for home assignment work, 12 marks for average of two internal tests and 2 marks for class notes 3 marks for attendance) and 70 marks for end semester end examination.**

There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

Third test facility can be availed as mentioned above (8.3.1 (i) (a) and (b)

8.6. Technical Seminar

There shall be a technical seminar evaluated for 100 marks from I year I semester to II year II Semester. The evaluation is purely internal and will be conducted as follows:

Sl.No	Description	Marks
1	Literature survey, topic and content	10
2	Presentation including PPT	10
3	Seminar Notes	05
4	Interaction with audience after presentation	05
5	Final Report 3 copies	10
6	Class room participation	05
7	Punctuality in giving seminar as per Scheduled time and date	10
8	Mid Semester Viva (on the seminar topics completed up to the end of 9th week	15
9	End Semester Viva	30
	Total	**100 Marks**

Student must secure 40% i.e. 40 marks to be successful in sum total (Hundred Marks) in Technical Seminar.

8.7 Comprehensive Test and Viva-voce:

Comprehensive test and Viva Voce	The subjects studied in the Semester concerned related to branches concerned and for placements
B.Tech I year I semester	I semester
B.Tech I year II semester	I and II semester
B.Tech II year I semester	I, II and III semester
B.Tech II year II semester	I, II, III and IV semester
B.Tech III year I semester	I, II, IIII, IV and V semester
B.Tech III year II semester	I, II, IIII, IV, V and VI semester
B.Tech IV year I semester	I, II, IIII, IV, V, VI and VII semester

Two Mid tests, Two mid Viva voce, one External Comprehensive Test and one External Comprehensive Viva Voce.

Allocation of marks :

*Comprehensive Test	: 70 marks
**Viva Voce	: 30 marks
Total	**: 100 marks**

*Average of two best Mid Tests of Mid Test – I, Mid Test – II and Mid Test - III will be taken for 30 marks.

Total marks for Comprehensive Test will be 70.

The total sessional marks in this subject of Comprehensive Test and Viva Voce will be : 30 for sessionals and 70 for End Semester examination.

The grand total of marks for the subject of Comprehensive Test and Viva Voce will be 100. The student has to secure 40% of marks i.e. 40 marks in sum total of 100 marks to be successful in the subject.

8.8 The laboratory records and internal test papers shall be preserved in the respective departments as per the college norms and shall be produced to the Committee of the college or any external agency like AICTE, NAAC, JNTUH, NBA etc., as and when the same are called for.

8.9. There shall be a Internship 1 and Internship 2, in an Industry of their specialization. Students will register for this immediately after II year II semester end examination and III year II semester examinations and pursue it during summer vacation. Internship 1 and Internship 2 shall be submitted as a project report and presented before the committee in III year I semester and IV year I semester along with lab examination. This project report will be evaluated for 30 internal marks and 70 external marks. The committee consists of an external examiner, Head of the Department, Supervisor of the Internship project and Senior Faculty Member of the Department.

8.10 The laboratory marks and the internal marks awarded by the college are subject to scrutiny and scaled down by the Departmental committees wherever necessary. In such cases, the internal and laboratory marks awarded by the department will be referred to a committee. The committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendation of the committee is final and binding. The laboratory records and internal test papers shall be preserved in the respective departments as per the college rules and produced before the visiting committees as and when they are asked for.

8.11. For mandatory courses like orientation course, cyber security, a student has to secure 40 marks out of 100 marks (i.e. 40% of the marks allotted) in sum total of continuous internal evaluation and external examination for passing the subject / course. These marks will be graded as per table given in 3.2.2.

9.0 Grading procedure

9.1 Marks will be awarded to indicate the performance of student in each theory subject, laboratory / practicals, seminar, Group Project 1,2,3, in the Major project and Comprehensive Test and Viva.

Based on the percentage of marks obtained (Continuous Internal Evaluation plus Semester End Examination, both taken together) as specified in item 8 above, a corresponding letter grade shall be given.

9.2 As a measure of the performance of student, a 10-point absolute grading system using the following letter grades (as per UGC / AICTE guidelines) and corresponding percentage of marks shall be followed:

% of Marks Secured in a Subject / Course (Class Intervals)	Letter Grade (UGC Guidelines)	Grade Points (GP)
Greater than or equal to 90%	O (Outstanding)	10
80% and less than 90%	A+ (Excellent)	9
70% and less than 80%	A (Very Good)	8
60% and less than 70%	B+ (Good)	7
50% and less than 60%	B (Average)	6
40% and less than 50%	C (Pass)	5
Below 40%	F (FAIL)	0
Absent	Ab	0

9.3 A student obtaining '**F'** grade in any subject shall be deemed to have '**failed'** and is required to reappear as a 'supplementary student' in the semester end examination, as and when offered. In such cases, internal marks in those subjects will remain the same as those obtained earlier.

9.4 A student who has not appeared for examination in any subject, '**Ab'** grade will be allocated in that subject, and student shall be considered '**failed'**. Student will be required to reappear as a 'supplementary student' in the semester end examination, as and when offered.

9.5 A letter grade does not indicate any specific percentage of marks secured by the student, but it indicates only the range of percentage of marks.

9.6 A student earns grade point (GP) in each subject / course, on the basis of the letter grade secured in that subject / course. The corresponding 'credit points' (CP) are computed by multiplying the grade point with credits for that particular subject/ course.

Credit points (CP) = grade point (GP) x credits …. For a course

9.7 The student passes the subject / course only when **GP is not less than 5 (i.e. 'C' grade or above)**

9.8 The Semester Grade Point Average (SGPA) is calculated by dividing the sum of credit points (CP) secured from all subjects / courses registered in a semester, by the total number of credits registered during that semester. SGPA is rounded off to two decimal places. SGPA is thus computed as

SGPA = { $\sum_{i=1}^{N} C_i G_i$ } / { $\sum_{i=1}^{N} C_i$ } …. For each semester

(i.e., upto and inclusive of S semesters, S 2),

where '**N'** is the **total** number of subjects (as specifically required and listed under the course structure of the parent department) the student has '**registered'** i.e., from the 1st semester onwards upto and inclusive of the 8th semester, 'j' is the subject indicator index (takes into account the subjects from 1 to 8 semesters), C_J is the number of credits allotted to the Jth subjects and G_j represents the grade points (GP) corresponding to the letter grade awarded for that Jth subject.

After registration and completion of the first year first semester, SGPA of that semester itself may be taken as the CGPA, as there are no cumulative effects.

Illustration of calculation of SGPA

Course / Subject	Credits	Letter Grade	Grade Points	Credit Points
Course 1	4	A	8	4 x 8 = 32
Course 2	4	O	10	4 x 10 = 40
Course 3	4	C	5	4 x 5 = 20
Course 4	3	B	6	3 x 6 = 18
Course 5	3	A+	9	3 x 9 = 27
Course 6	3	C	5	3 x 5 = 15
	21			152

SGPA = 152/21 = 7.24

Illustration of calculation of CGPA:

Course / Subject	Credits	Letter Grade	Grade Points	Credit points Points
I				
Course 1	4	A	8	4 x 8 = 32
Course 2	4	A	9	4 x 9 = 36
Course 3	4	B	6	4 x 6 = 24
Course 4	3	O	10	3 x 10 = 30
Course 5	3	B	7	3 x 7 = 21
Course 6	3	A	8	3 x 8 = 24
I				
Course 7	4	B	7	4 x 7 = 28
Course 8	4	O	10	4 x 10 = 40
Course 9	4	A	8	4 x 8 = 32
Course 10	3	B	6	3 x 6 = 18

Course 11	3	C	5	3 x 5 = 15
Course 12	3	A	9	3 x 9 = 27
Total Credits	= 42			Total Credit Points =327

CGPA = 327/42 = 7.79

9.9 For merit ranking or comparison purposes or any other listing, **only** the '**rounded off'** values of the CGPAs will be used.

9.10 For calculations listed in regulations 9.6 to 9.9, performance in failed subjects/ courses (securing **F** grade) will also be taken into account, and the credits of such subjects/courses will also be included in the multiplications and summations.

After passing the failed subject(s) newly secured letter grades will be taken into account for calculation of SGPA and CGPA.

However, mandatory courses will not be taken into consideration.

10.0 Passing standards

10.1 A student shall be declared successful or 'passed' in a semester, if student secures a GP $\geq$ 5 ('C' grade or above) in every subject/course in that semester (i.e. when student gets SGPA 5.00 at the end of that particular semester); and a student shall be declared successful or 'passed' in the entire under graduate programme, only when gets a CGPA 5.00 for the award of the degree as required.

10.2 After the completion of each semester, a grade card or grade sheet (or transcript) shall be issued to all the registered students of that semester, indicating the letter grades and credits earned. It will show the details of the courses registered (course code, title, no. of credits, and grade earned etc.), credits earned, SGPA, and CGPA.

11.0 Declaration of results

11.1 Computation of SGPA and CGPA are done using the procedure listed in 9.6 to 9.9.

11.2 For final percentage of formula may be used.

12.0 **Award of degree** marks equivalent to the computed final CGPA, the following
% of Marks = (final CGPA – 0.5) x 10

12.1 A student who registers for all the specified subjects/ courses as listed in the course structure and secures the total number of credits (with CGPA $\geq$5.0), within 8 academic years from the date of commencement of the first academic year, shall be declared to have '**qualified'** for the award of the B.Tech. degree in the chosen branch of Engineering as selected at the time of admission.

12.2 A student who qualifies for the award of the degree as listed in item 12.1 shall be placed in the following classes.

12.3 Students with final CGPA (at the end of the under graduate programme) 8.00 and above, and fulfilling the following conditions -

(i) Should have passed all the subjects/courses in '**first appearance'** within the first 4 academic years (or 8 sequential semesters) from the date of commencement of first year first semester.

(ii) Should have secured a CGPA $\geq$ 8.00, at the end of each of semesters, starting from first year first semester onwards.

(iii) Should not have been detained or prevented from writing the end semester examinations in any semester due to shortage of attendance or any other reason, shall be placed in **'FIRST CLASS WITH DISTINCTION'**, otherwise **FIRST CLASS** only.

12.4 Students with final CGPA (at the end of the under graduate programme) $\geq$ 6.5 but < 8.00, shall be placed in '**FIRST CLASS'**.

12.5 Students with final CGPA (at the end of the under graduate programme) $\geq$ 5.5 but < 6.5, shall be placed in '**SECOND CLASS'**.

12.6 All other students who qualify for the award of the degree (as per item 12.1), with final CGPA (at the end of the under graduate programme) $\geq$ 5 but < 5.5, shall be placed in '**pass class**'.

12.7 A student with final CGPA (at the end of the under graduate programme) < 5.00 will not be eligible for the award of the degree.

12.8 Students fulfilling the conditions listed under item 12.3 alone will be eligible for award of '**university rank**' and '**gold medal**'.

13.0 Withholding of results

13.1 If the student has not paid the fees to the university / college at any stage, or has dues pending due to any reason whatsoever, or if any case of indiscipline is pending, the result of the student may be withheld, and student will not be allowed to go into the next higher semester. The award or issue of the degree may also be withheld in such cases.

14.0 Transitory regulations

14.1 A student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the degree programme, may be considered eligible for readmission to the same subjects / courses (or equivalent subjects/ courses, as the case may be), and same professional electives / open electives (or from set/category of electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the date of commencement of student's first year first semester).

A student admitted in one academic regulation and he is getting readmission in some other academic regulations , the college has to offer substitute / additional subjects based on the comparison of two academic regulations. The details of substitute / additional subjects offered with the recommendations of board of studies of the concerned branch has to be given from time to time. The student will be governed by the academic regulations at the time of re-admission.

15.0 Student transfers

15.1 There shall be no branch transfers after the completion of admission process.

15.2 The students seeking transfer to Sreenidhi Institute of Science and Technology (SNIST) from various other Universities / institutions have to pass the failed subjects which are equivalent to the subjects of SNIST, and also pass the subjects of SNIST which the students have not studied at the earlier institution.

Further, though the students have passed some of the subjects at the earlier semesters of SNIST, the students have to study substitute subjects in SNIST and get sessional marks by attending 3rd mid test and paying requisite fee as per the rules.

15.3 The transferred students from other Universities/ institutions to SNIST who are on rolls to be provided one chance to write the CIE (internal marks) in the failed subjects and /or subjects not studied as per the clearance letter issued by the Institution.

15.4 The autonomous affiliated colleges have to provide one chance to write the internal examinations in the failed subjects and /or subjects not studied, to the students transferred from other universities / institutions to SNIST who are on rolls, as per the clearance (equivalence) letter issued by the University.

16.0 **Scope**

16.1 The academic regulations should be read as a whole, for the purpose of any interpretation.

16.2 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final and binding.

16.3 The Institution may change or amend the academic regulations, course structure or syllabi at any time, and the changes or amendments made shall be applicable to all students with effect from the date notified by the Institution.

Academic Regulations for B.Tech.

(LATERAL ENTRY SCHEME)

w.e.f the AY 2021-22

1. Eligibility for award of B. Tech. Degree (LES)

The Lateral Entry Scheme (LES) students after securing admission shall pursue a course of study for not less than three academic years and not more than six academic years failing which he will forfeit the seat.

2. The student shall register and secure for all the credits with CGPA ≥ 5 from II year to IV year B.Tech. programme (LES) as per the regulations for the award of B.Tech. degree. **Out of the total credits secured, the student can avail exemption up to 6 credits**, that is, one open elective subject and one professional elective subject or two professional elective subjects for B.Tech programme to improve the performance of the Grade point average.

3. The students, who fail to fulfil the requirement for the award of the degree in six academic years from the year of admission, shall forfeit their seat in B.Tech. However, the student can take **two more** years for appearing the examinations.

4. The attendance requirements of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

5. <u>Promotion rules based on credits</u>

S.	Promotion	Conditions to be fulfilled
1	Second year first semester to second year second semester	Regular course of study of second year first semester.
2	Second year second semester to third year first semester	(i) Regular course of study of second year second semester. (ii) Must have secured at least 27 credits out of 45 credits i.e., 60% of credits up to second year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
3	Third year first semester to third year second semester	Regular course of study of third year first semester.
4	Third year second semester to fourth year first semester	(i) Regular course of study of third year second semester. (ii) Must have secured at least 52 credits out of 87 credits i.e., 60% of credits up to third year second semester from all the relevant regular and supplementary examinations, whether the student takes those examinations or not.
5	Fourth year first semester to fourth year second semester	Regular course of study of fourth year first semester.

6. All the other regulations as applicable to B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme).

MALPRACTICE RULES
DISCIPLINARY ACTION FOR MIS-CONDUCT OF STUDENTS DURING EXAMINATIONS

	Nature of Malpractice/ Mis-conduct of the conduct	**Punishment**
	If the student:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which student is appearing but has not made use of (material shall include any marks on the body of the student 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.
(b)	Gives assistance or guidance or receives it from any other student orally or by any other body language methods or communicates through cell phones with any student or persons in 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 students involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
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 student is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The hall ticket of the student is to be cancelled and sent to the university.
3.	Impersonates any other student in connection with the examination.	The student who has impersonated shall be expelled from examination hall. The student is also debarred and forfeits the seat. The performance of the original student who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and UG major project) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation
		of the course by the student is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.

4.	Smuggles in the answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the student 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 of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result 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.	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 student(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The students also are 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.

7.	Leaves the exam hall taking away answer script or intentionally tears of 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 student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred for two consecutive semesters from class work and all university examinations. The continuation of the course by the student is subject to the academic regulations in connection with forfeiture of seat.

8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student is also debarred and forfeits the seat.
9.	If student of the college, who is not a student for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year. The student 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 condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the student has already appeared including practical examinations and UG major project and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11	Copying 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 student has appeared including practical examinations and UG major project 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 university for further action to punishment award suitable.

Malpractices identified by squad or special invigilators

1. Punishments to the students as per the above guidelines.

2. Punishment for institutions: (if the squad reports that the college is encouraging malpractices)

   a. A show cause notice shall be issued to the college.
   b. Impose a suitable fine on the college.
   c. Shifting the examination centre from the college to another college for a specific period of not less than one year.

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SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING

B.Tech Course Structure – Autonomous Regulation: 2020-21(164 Credits)

I Year I Semester

Sr. No	Subject Code	Subject	L	T	P/ D	C	Max Marks	
							CIE	SEE
1	8HC04	Engineering Chemistry	4	0	0	4	30	70
2	8FC01	Problem solving using C	3	0	0	3	30	70
3	8HC09	Matrix Methods and Calculus (MMC)	2	1	0	3	30	70
4	8HC08	Basic Mathematics, Analysis and Reasoning	2	1	0	3	30	70
5	8HC01	Oral Communication skills	1	0	0	1	30	70
6	8BC01	Workshop / Manufacturing processes	1	0	0	1	30	70
7	8HC63	Engineering Chemistry Laboratory	0	0	2	1	30	70
8	8FC71	Problem solving using C Laboratory	0	0	2	1	30	70
9	8HC61	Oral Communication skills Laboratory	0	0	2	1	30	70
10	8BC61	Workshop / Manufacturing processes Laboratory	0	0	2	1	30	70
11	8K182	Technical Seminar – I	0	0	2	1	100	-
12	8K192	Comprehensive Test and Viva Voce – I	1	0	0	1	30	70
13	8HC18	Orientation Course (Mandatory course – One Week.)	1	0	0	0	Marks and Grade will be given at the end of I year II semester	
		Total :	**15**	**2**	**10**	**21**	**430**	**770**

I Year II Semester

Sr. No	Subject Code	Subject	L	T	P/ D	C	Max Marks	
							CIE	SEE
1	8HC06	Applied Physics	3	1	0	4	30	70
2	8K201	Engineering Mechanics	3	1	0	4	30	70
3	8HC13	Differential Equations and Integral Calculus	3	1	0	4	30	70
4	8EC01	Data Structure and C++	3	0	0	3	30	70
5	8HC02	Written communications skills	1	0	0	1	30	70
6	8BC02	Engineering Graphics	1	0	4	3	30	70
7	8HC64	Applied Physics Laboratory	0	0	2	1	30	70
8	8HC62	Written communications skills Laboratory	0	0	2	1	30	70
9	8EC61	Data structures (C/C++) Lab	0	0	2	1	30	70
10	8K283	Technical Seminar – II	0	0	2	1	100	-
11	8K293	Comprehensive Test and Viva Voce – II	1	0	0	1	30	70
12	8HC18	Orientation Course (Mandatory course – Two weeks.)	2	0	0	0	30	70
							Grade Evaluation	
		Total:	**17**	**3**	**12**	**24**	**430**	**770**

II Year I Semester

Sr. No	Subject Code	Subject	L	T	P/ D	C	Max Marks	
							CIE	SEE
1	8HC15	Complex analysis, Probability and Statistics	2	1	0	3	30	70
2	8K301	Solid Mechanics	2	1	0	3	30	70
3	8K302	Surveying and Geometrics	3	0	0	3	30	70
4	8K303	Building Materials and Planning	2	0	0	2	30	70
5	8HC74	Soft Skills	**1**	0	2	2	30	70
6		Open Elective – I	2	0	0	2	30	70
7	8HC03	Universal Human Values	2	1	0	3	30	70
8	8K371	Mechanics of Solids Laboratory	0	0	2	1	30	70
9	8K372	Survey Laboratory	0	0	2	1	30	70
10	8K373	Computer Aided Drafting of Building Laboratory	0	0	2	1	30	70
11	8K384	Technical Seminar –III	0	0	2	1	100	-
12	8K394	Comprehensive Test and Viva Voce – III	1	0	0	1	30	70
		Total :	**15**	**3**	**10**	**23**	**430**	**770**

II Year II Semester

Sr. No	Subject Code	Subject	L	T	P/ D	C	Max Marks	
							CIE	SEE
1	8ZC01	Economics, Accountancy, and Management Science	2	0	0	2	30	70
2	8K404	Mechanics of Materials	2	1	0	3	30	70
3	8K405	Fluid Mechanics	2	1	0	3	30	70
4	8K406	Hydrology and Water resources engineering	3	0	0	3	30	70
5	8K407	Engineering Geology	2	0	0	2	30	70
6	8HC05	Environmental Science and Ecology	2	0	0	2	30	70
7		Open Elective – II	2	0	0	2	30	70
8	8K471	Fluid mechanics Laboratory	0	0	2	1	30	70
9	8K472	Engineering Geology Laboratory	0	0	2	1	30	70
10	8K473	MATLAB	0	0	2	1	30	70
11	8K485	Technical Seminar –IV	0	0	2	1	100	-
12	8K495	Comprehensive Test and Viva voce –IV	1	0	0	1	30	70
		Total	**16**	**2**	**8**	**22**	**430**	**770**

Open Elective – I: List of Subjects (II-I)

Sr. No	Name of Stream	Subject Code	Subject Name
1	Computer Science Stream	8FC22	Python Programming and Computer Algorithms
2	Entrepreneurship Stream	8ZC02	Basics of Entrepreneurship
3	Finance Stream	8ZC11	Banking, Insurance, and Risk Management.
4	Innovation and Design Thinking Stream	8ZC08	Design literacy and Design Thinking

Open Elective – II: List of Subjects (II-II)

Sr. No	Name of Stream	Subject Code	Subject Name
1	Computer Science Stream	8EC42	Programming in Java
2	Entrepreneurship Stream	8ZC03	Product and Services
3	Finance Stream	8ZC12	Entrepreneurship Project Management and Structured Finance
4	Innovation and Design Thinking Stream	8ZC09	Co-Creation and Product Design

III Year I Semester

Sr. No	Subject Code	Subject	L	T	P/D	C	Max Marks	
							CIE	SEE
1	8K585	Summer Internship –I (Done after II_II: 2 internal reviews (30M)+ external – 70M)	**0**	0	0	1	100	-
2	8K510	Hydraulic Engineering	**2**	1	0	3	30	70
3	8K511	Geotechnical Engineering	**2**	1	0	3	30	70
4	8K512	Transportation Engineering	**3**	1	0	**4**	30	70
5		Professional Elective – I	**3**	0	0	3	30	70
6		Open Elective – III	**2**	0	0	2	30	70
7	8K571	Hydraulics Engineering Lab	0	0	2	1	30	70
8	8K572	Geotechnical Engineering lab	0	0	2	1	30	70
9	8K573	Transportation Engineering Lab	0	0	2	1	30	70
10	8K596	Comprehensive Test and Viva voce –V	1	0	0	1	30	70
11	8K577	Group Project – I (At least Conf. paper is expected)	**0**	0	2	1	30	70
12	8FC24	Cyber Security (mandatory course)	**2**	0	0	0	30	70
							Grade Evaluation	
			15	**3**	**8**	**21**	**430**	**770**

Professional Elective – I: List of Subjects (III-I)

Sr. No	Name of Stream	Subject Code	Subject Name
1	Structural Engineering	8KC51	Reinforced Concrete Design
2	Water Resources and Environmental Engineering	8KC52	Pipe Line Engineering
3	Transportation Engineering	8KC53	Railway Engineering
4	Geotechnical Engineering	8KC54	Soil Mechanics - I

Open Elective – III: List of Subjects (III-I)

Sr. No	Name of Stream	Subject Code	Subject Name
1	Computer Science Stream	8EC44	Data Base System Concepts
2	Entrepreneurship Stream	8ZC04	Advanced Entrepreneurship
3	Finance Stream	8ZC13	Financial Institutions, Markets and Services
4	Innovation and Design Thinking Stream	8ZC10	Entrepreneurship & Business Design

III Year II Semester

Sr. No	Subject Code	Subject	L	T	P/D	C	Max Marks	
							CIE	SEE
1	8AC48	Elements of Electrical & Electronics Engineering	3	0	0	3	30	70
2	8K613	Geographic Information System	**2**	0	0	**2**	30	70
3	8K614	Environmental Engineering	**2**	0	0	**2**	30	70
4	8K615	Concrete Technology	**3**	0	0	**3**	30	70
5		Professional Elective –II	**3**	0	0	**3**	30	70
6	8EC45	Artificial Intelligence	**2**	0	0	**2**	30	70
7	8K671	Geographical Information Systems Lab	0	0	2	1	30	70
8	8K672	Environmental engineering Lab	0	0	2	1	30	70
9		Electrical & Electronics Engineering Lab	0	0	2	1	30	70
10	8EC78	Artificial Intelligence Lab	0	0	2	1	30	70
11	8K678	Group Project – II (At least Conf. paper is expected)	**0**	**0**	2	**1**	30	70
12	8K697	Comprehensive Test and Viva voce –VI	**1**	**0**	**0**	**1**	30	70
			16	**0**	**10**	**21**	**360**	**840**

Professional Elective – II**: List of Subjects (III-II)**

Sr. No	Name of Stream	Subject Code	Subject Name
1	Structural Engineering	8KC61	Design of Steel Structures
2	Water Resources and Environmental Engineering	8KC62	Climate Change and Sustainable Development
3	Transportation Engineering Stream	8KC63	Airport Planning & Design
4	Geotechnical Engineering Stream	8KC64	Soil Mechanics - II

IV Year I Semester

Sr. No	Subject Code	Subject	L	T	P/ D	C	Max Marks	
							CIE	SEE
1	8K786	Summer Internship – II (Done after III_II; 2 internal reviews (30M)+ external – 70M)	**0**	0	**0**	**1**	100	-
2	8BC04	Elements of Mechanical Engineering	2	0	0	**2**	30	70
3	8K717	Finite Element Method for Civil Engineers	**3**	1	0	**4**	30	70
4	8K718	Design and Detailing of Hydraulics Structures	**2**	1	0	**3**	30	70
5	8K719	Estimation, costing and valuation	**3**	0	0	**3**	30	70
6		Professional Elective – III	**3**	0	0	**3**	30	70
7	8K771	Concrete Technology Lab	**0**	0	2	**1**	30	70
8	8K772	Computer Applications in Civil Engineering Lab	**0**	0	2	**1**	30	70
9	8K773	Estimation & Quantity Surveying Laboratory	**0**	0	2	**1**	30	70
10	8K798	Comprehensive Test and Viva voce –VII	1	0	0	**1**	30	70
11	8K779	Group Project – III (At least Conf. paper is expected)	**0**	0	2	**1**	30	70
			14	**2**	**8**	**21**	**400**	**700**

Professional Elective – III **:List of Subjects (IV-I)**

Sr. No	Name of Stream	Subject Code	Subject Name
1	Structural Engineering	7KC71	Disaster Mitigation and Management
2	Water Resources and Environmental Engineering Stream	7KC72	Surface Water Hydrology
3	Transportation Engineering Stream	7KC73	Pavement Design
f4	Geotechnical Engineering Stream	8KC74	Ground Improvement Techniques

IV Year II Semester

Sr. No	Subject Code	Subject	L	T	P/D	C	Max Marks	
							CIE	SEE
1		Professional Elective – IV	**3**	0	0	**3**	30	70
2		Professional Elective – V	**3**	0	0	**3**	30	70
3	8K880	Major Project	**0**	0	10	**5**	30	70
		Total	**6**	**0**	**10**	**11**	**90**	**210**

Professional Elective – IV**: List of Subjects (IV-II)**

Sr. No	Name of Stream	Subject Code	Subject Name
1	Structural Engineering	8KC81	Structural Engineering
2	Water Resources and Environmental Engineering	8KC82	Ground water Hydrology
3	Transportation Engineering	8KC83	Urban Transportation Planning
4	Geotechnical Engineering	8KC84	Landfill Engineering

Professional Elective – V :List of Subjects (IV-II)

Sr. No	Name of Stream	Subject Code	Subject Name
1	Structural Engineering	8KC86	Foundation Analysis and Design
2	Water Resources and Environmental Engineering	8KC87	Water Quality Engineering
3	Transportation Engineering	8KC88	Intelligent Transportation Systems
4	Geotechnical Engineering Stream	8KC89	Environmental Geo technology

L: Lecture T: Tutorial P/D: Practical / Drawing C: Credits

CIE: Continuous Internal Evaluation SEE: Semester End Examination

AICTE Course Categorization

Sl.No.	Category	Suggested breakup of Credits (Total 160)	CED
1	Humanities and social sciences including Management courses	12*	11
2	Basic Science courses	25*	29
3	Engineering Science courses including workshop, drawing, basics of electrical / mechanical / computer etc	24*	31
4	Professional core courses	48*	51
5	Professional Elective courses relevant to chosen specialization / branch	18*	15
6	Open Electives from other technical and / or emerging subjects	18*	6
7	Project work, seminar and internship in industry or elsewhere	15*	21
8	Mandatory courses (Environmental Sciences, Induction training, Indian constitution, Essence of Indian Traditional Knowledge)	(Non-Credit)	(Non-Credit)
	Total	**160***	**164**

a	b	c	d	e	f	g	h	i	j	k	l
X					X	X					

8HC04 - ENGINEERING CHEMISTRY

(Common to all branches)

I B. Tech I Sem (for CSE, ECE and CE)

I B. Tech II Sem (for EEE, ME, IT and ECM

L	T	P	C
4	0	0	4

Course Objectives:

1. To understand microscopic chemistry in terms of atomic and molecular orbitals
2. To learn the preparation and applications of commercial polymers and lubricant materials
3. To learn the industrial problems caused by water and municipal water treatment
4. To acquire knowledge about different types of batteries and their working mechanism
5. To develop the concepts and types of corrosion and the factors influence corrosion
6. To understand the control methods and protective coatings for metals and other surfaces

UNIT - I

Atomic and molecular structure (6L)

Molecular orbitals of diatomic molecules and plots of the multicentre orbitals. Equations for atomic and molecular orbitals. Energy level diagrams of diatomics. Pi-molecular orbitals of butadiene and benzene and aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

UNIT - II

Plastics and Lubricants

Plastics (8L)

Polymerization-Addition and Condensation polymerization, Plastics – Thermosetting and Thermoplastics, preparation, properties and **engineering applications of plastics:** PVC, Teflon, Bakelite. Fibers: Nylon 6,6 and Dacron.

Rubbers – natural and artificial rubber, vulcanization of natural rubber, Buna-S, Buna-N and their **engineering applications.**

Fabricated Reinforcing Polymers- **engineering applications**

Lubricants

Definition, classification and function of lubricants, Types of lubrication and mechanisms – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants – Viscosity, flash and fire point, cloud and pour point and acid value. **Engineering applications.**

UNIT - III

Water Technology (8L)

(a) Introduction: - Hardness of water – types of hardness (temporary and permanent), calculation of hardness- Numerical problems. Estimation of hardness of water by EDTA Method.

(b) Water for Industrial purpose: Food, sugar, textile, paper and pharma industries, water for steam making characteristics of boiler feed water, boiler troubles- scale and sludge & Carry over (priming &foaming), boiler corrosion, caustic embrittlement.

(c) Water Treatment: Internal conditioning- phosphate, carbonate & calgon conditioning. External Treatment: Ion-exchange process. Desalination-reverse osmosis. Municipal water treatment-sedimentation, coagulation, filtration, disinfection-chlorination, ozonization. **Engineering applications: Methodology and working of mineral water plant for drinking purpose.**

UNIT - IV

Electrochemistry (8L)

Conductance – conductors (metallic and electrolytic), types of conductance – specific, equivalent and molar conductance – effect of dilution on conductance.

Free energy and emf, cell potentials, electrode potential (oxidation and reduction). Types of electrodes - redox electrode (quinhydrode electrode), metal – metal insoluble salt electrode and Ion selective electrode. Cell notation and cell reaction –Nernst equation and applications. **Engineering Applications.**

Batteries : Types of batteries

(a) Primary batteries – Lechalanche cell (dry cell), Lithium cell
(b) Secondary batteries(Accumulators) – Lead acid battery, Lithium-ion battery

(c) Fuel cells- $H_2 – O_2$ fuel cell and MeOH-O_2 fuel cell-advantages and applications. **Engineering applications – future water powered car, Hydrogen production and storage**.

UNIT - V

Corrosion and its prevention (7L)

Corrosion – basic concepts –types of corrosion, chemical, electrochemical corrosion (absorption of O_2 and evolution of H_2). Types of electrochemical corrosion – galvanic corrosion, pitting corrosion, waterline corrosion- factors affecting the rate of corrosion.

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Cathodic protection – sacrificial anodic protection and impressed current cathodic protection method.

UNIT-VI

Surface treatment (5L)

Mechanical surface treatment and coatings, casehardening and surface coating, thermal spraying, vapour deposition, Ion implantation, Diffusion coating.

Methods of metallic coatings-hot dipping (tinning and galvanizing), metal cladding (Al cladding), electroplating (copper plating) and electroless plating (nickel plating) and electroforming, ceramic, organic and diamond coating

.**TEXT BOOKS:**

1. Engineering Chemistry: PK Jain & MK Jain, Dhanapathrai Publications (2018)
2. Engineering Chemistry: by Thirumala Chary Laxminarayana & Shashikala, Pearson Publications (2020)

REFERENCE BOOKS:

1. Textbook of Engineering Chemistry: Jaya Shree Anireddy, Wiley Publications (2019)
2. Engineering Chemistry: by & B.Rama Devi, Prsanta Rath & Ch. Venkata Ramana Reddy, Cengage Publications (2018)
3. Engineering Chemistry: Shashi Chawla, Dhanapathrai Publications (2019)
4. Textbook of Engineering Chemistry: SS Dara, SS Umare S. Chand Publications (2004)

Course Outcomes

After completion of the course, the student will be able to:

1. Understand and analyse microscopic chemistry in terms of atomic orbitals, molecular orbitals and intermolecular forces.
2. Identify and differentiate polymers, thermoplastic, thermosetting plastics and various lubricants.
3. Recognize and select the domestic and industrial problems caused by hard water and also learn about the municipal water treatment using various methods.
4. Understand and interpret the important fundamental concepts of electrochemistry and solve the problems related to batteries.
5. Differentiate the types of corrosion and methods used to prevent the corrosion.
6. Learn and implement surface coating techniques.

1	2	3	4	5	6	7	8	9	10	11	12
		M		H							L

Problem Solving using C
(Common to All Branches)

Code: 8FC01

L	T	P	C
3	0	0	3

Course Objectives

- To acquire problem solving skills
- To be able to develop flowcharts
- To understand structured programming concepts
- To be able to write programs in C Language

Course Outcomes:

After completion of this course student will learn

1. To formulate simple algorithms for arithmetic, logical problems and to translate the algorithms to programs(in C language)
2. To test and execute the programs and correct syntax and logical errors, to implement conditional branching, iteration and recursion
3. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
4. To use arrays, pointers and structures to formulate algorithms and programs.
5. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
6. To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.

UNIT I

Introduction to Programming: Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)

Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples.

From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code

UNIT II

History of C language, Characteristics of C language, Structure of C Language, C Tokens

Arithmetic expressions, Operator Precedence & **Associativity**

Conditional Branching and Loops

Writing and evaluation of conditionals and consequent branching and **Jumping Constructs Pretest and Post test**, Iteration and loops (3 lectures)

UNIT III

Function: Functions (including using built in libraries), Parameter passing in functions, call by value, passing arrays to functions: idea of call by reference, **Storage Classes**
Recursion: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc.
Macros – Definition, comparison with functions.

UNIT IV

Arrays: Arrays (1-D, 2-D), Character arrays **Ragged Arrays and Dynamic Arrays**
Basic Algorithms Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required) Quick sort or Merge sort.

UNIT V

Pointers Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notation of linked list (no implementation) **Dynamic Memory allocation Functions**.
Strings: String Handling Functions.

UNIT IV

Structure: Structures, Defining structures and Array of Structures,
Nested Structures enum, typedef
File handling (only if time is available, otherwise should be done as part of the lab)
File Handling Functions, File Modes, File Operations

Suggested Text Books

(i) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill

(ii) E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill Suggested

Reference Books

(i) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

a	b	c	d	e	f	g	h	i	j	k	l
H	M	M								L	

H: High M: Medium L: Low

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY

(An Autonomous Institution approved by UGC and 'A' Grade Awarded by NAAC)

I Year B.Tech, Semester-1 **CALCULUS AND MATRIX METHODS**

(Common to EEE, ECE, ME, CE)

	L	T	P/D	C
Code: 8HC09	**2**	**1**	**0**	**3**

Pre Requisites: Mathematics Knowledge at Pre-University Level

Course Objectives: *To make the students to understand and expected to learn*

1. *Mean value theorems and their applications to the given functions, series expansions of a function.*
2. *Special functions such as Beta & Gamma functions and their properties, evaluation of improper integrals and the applications of definite integrals.*
3. *To test the convergence of a series and expansion of a function in sine and cosine terms.*
4. *Basic concepts of multivariable differential calculus.*
5. *About the linear system and some analytical methods for solution.*
6. *Concept of Eigen values and Eigen vectors their properties and applications.*

Syllabus

UNIT*-I:** ***Calculus-1

Rolle's Theorem and Mean value theorems (Statements and Geometrical Interpretations if any); Taylor's and Maclaurin's theorems with remainders (without proof); Taylor's and Maclaurin series expansion.

UNIT-II: Calculus-2

Evolutes and involutes; Beta and Gamma functions and their properties; Evaluation of improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions.

UNIT-III: Sequences and series

Convergence of sequence and series, tests for convergence of a series. Fourier series, half range sine and cosine series, Parseval's theorem (without proof).

UNIT-IV: Multivariable Calculus (Differentiation)

Limit, continuity and partial derivatives, total derivative; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, directional derivatives, Tangent plane; Concepts of divergence and curl with physical significance.

(PTO)

UNIT-V: Matrices-1

Inverse of a matrix by Gauss Jordan method, rank of a matrix; System of linear equations-Rank method/Gauss Elimination method. Symmetric, skew-symmetric and orthogonal matrices;

UNIT-VI: Matrices-2

Eigenvalues and Eigenvectors; Cayley - Hamilton Theorem, Hermitian, Skew-Hermitian and Unitary matrices, Diagonalization of matrices and Orthogonal transformation.

Text Books:

(i) R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.

Reference Books:

(i) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
(ii) B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers
(iii) C Sankaraiah, A Text book of Engineering Mathematics – I, VGS Book Links
(iv) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
(v) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
(vi) P. Sivaramakrishna Das and C.Vijayakumari, Mathematics-I (calculus, Differential Equations and Linear Algebra), Pearson Publications

Course Outcomes: *After the course completion the students will be able to*

1. *Verify the mean value theorems and also express the given function in series form using Taylor's theorem.*
2. *Solve the problems using special functions; evaluate surface areas and volumes of revolutions.*
3. *Determine the convergence, divergence or oscillating nature of a series and express the function as trigonometric series.*
4. *Compute the extreme values of a function defined with and without constraints.*
5. *Check the consistency or inconsistency of a linear system and ability to solve real time problems.*
6. *Calculate the Eigen values and Eigen vectors of a matrix and their application for orthogonal transformation.*

1	2	3	4	5	6	7	8	9	10	11	12
H	M	L									

I Year B.Tech **INTRODUCTORY MATHEMATICS, ANALYSIS AND REASONING**

(Common to All Branches)

	L	T	P/D	C
Code: 8HC08	2	1	0	3

Pre Requisites: Nil

Course objectives: *By learning Quantitative Aptitude and Logical Reasoning, a student can answer general problems in his everyday life within a short time with the help of quicker methods. Also it improves the certain skills of a student such as numerical and logical ability, mental capacity and also in sharpening minds. This course is very much useful for competitive examinations.*

Syllabus

Unit I: Number System: Test for Divisibility, Test of prime number, Division and Remainders – HCF and LCM of Numbers – Fractions and Decimals-Vedic Mathematics-Average-Problems on Ages- Problems on Numbers-Ratio and Proportion.

Unit II: Percentage – Profit, Loss and Discount – Partnership and Share-Simple Interest - Compound Interest. Time and Work- Pipes and Cisterns-Time and Distance- Problems on Trains- Boats and Streams, Allegation or Mixtures.

Unit III: Mensuration: Area of Plane Figures, Volume and Surface Area of Solid Figures.
Data Interpretation: Tabulation, Bar Graphs, Pie Charts, Line Graphs-Logarithms-Permutation and Combination-Probability-Linear Equations-Quadratic Equations-Surds and Indices-Coordinate geometry.

Unit–IV: Series Completion: Number Series, Alphabet Series, Alpha – Numeric Series.
Analogy: Completing the Analogous Pair, Simple Analogy, Choosing the Analogous pair, Double Analogy, Word Analogy, and Number Analogy.
Classification: Word Classification, Number Classification and Letter Classification.
Coding & Decoding: Letter Coding, Number Coding, Matrix Coding, Substitution, Deciphering Message Word Codes, Jumbled Coding. Crypt arithmetic-Inequalities-Input Output Tracing

Unit–V: Blood Relations– Direction sense test- Number, Ranking & Time Sequence Test –Mathematical Operations-Arithmetical Reasoning. Puzzle Test: Classification Type Questions, Seating Arrangements, Comparison Type Questions, Sequential Order of Things, Selection Based on Given Conditions, Family Based Puzzles, Jumbled Problems.
Unit –VI: Logical Venn Diagrams –Cubes and Dice – Analytical Reasoning-Assertions and Reason–Logical Deductions-Syllogism -Statement and Arguments-Statement and Conclusions-Clocks & Calendar-Data Sufficiency.

Text Books:

1. Quantitative Aptitude by R.S.Agarwal
2. Verbal and Non Verbal Reasoning by R.S.Agarwal.

Course Outcomes: *After completion of this course students will be able to solve, the questions given on testing divisibility, HCF and LCM,averages, percentage and profit and loss, ratio and proportion simple and compound interest, time and work, time and distance and etc. Also able to solve the questions given on series completion and analogy, odd one out and coding and decoding, blood relations, directions and Arithmetical reasoning, Venn diagrams,cubes and dice, clocks and calendar.*

Proposed Syllabus (A-20 Regulation)
Oral Communication Skills
CSE, ECE, CIVIL: I/I

IT, MECH, ECM, EEE: I/II

Subject Code: 8HC01 **Lab Code: 8HC61**

L – T –P/D – C **L – T –P/D - C**

1 0 0 1 **0 0 2 1**

A	B	C	D	E	F	G	H	I	J	K	L
							X	X	X		X

Course Objectives:
To enable students to:
enhance oral communication skills
develop the skill of speaking extemporaneously
enrich their vocabulary and subsequently hone their verbal aptitude
learn to make formal presentations both online and offline.
learn to listen and comprehend well
learn the nuances of the art of group discussion

Unit: 1

Effective Oral Communication:
1.1. Introduction to Communication
1.2. Barriers to communication
1.3. Strategies to improve communication skills
1.4. Self introduction, introducing others and greetings

UNIT: 2
Extemporaneous Speaking:
2.1. Speaking on a topic - JAM
2.2. Use of cohesive devices in speaking
2.3. Common Errors in Spoken English

UNIT: 3 Soft Skills
3.1. Confidence Building
3.2. Etiquette
UNIT: 4
Presentation Skills:
4.1 Storytelling
4.2 Presenting data effectively in formal presentations
4.3 Managing online presentations

UNIT:5
Reading Comprehension
5.1: Reading comprehension Techniques
5.2: Practice passages

UNIT: 6

Group Discussion:

6.1 Importance of Group Discussions

6.2 Do's and Don'ts of Group Discussions

Text Book: Compiled by the faculty of Sreenidhi (for internal circulation only)

Suggested Readings: * SPOKEN ENGLISH A Self-Learning Guide to Conversation Practice by V Sasikumar P. V. Dhamija

- English for Professionals by S.S.Prabhakar Rao
- English for Business Communication by Dr.T.Farhathullah
- Professional Communication by Alok Jain, Pravin S.R.Bhatia and A.M.Sheikh
- Objective English : Pearson's Publications
- Word Power Made Easy: Norman Lewis
- Business Communication Strategies :Monipally.

1	2	3	4	5	6	7	8	9	10	11	12
		M		H							L

WORKSHOP/MANUFACTURING PROCESSES
(Theory)

Code :

L	T	P/D	C
1	0	0	1

Course Objectives:

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

COURSE OUTCOMES:

1) To understand various basic tools to perform simple joints using metal and wood.
2) To understand the principle of various electrical and electronic appliances and their applications.
3) To understand the manufacturing process of welding, casting and tin smithy and their applications.
4) To understand the operation of basic as well as advanced machines used for fabrication of Metals, Plastics and Glass.

Unit-I

Fitting & Power Tools : Fitting Tools- Marking and Measuring tools, Cutting tool, Finishing tools-etc- basic Fitting operations, Safe working practices

Introduction to power tools- Power Hacksaw, Drill, Grinder ,etc.

Unit-II

Electrical & Electronics Appliances: Introduction, wires and wires sizes, wiring boards, common house wiring methods, symbols and house hold electrical appliances.

Unit-III

Carpentry: Introduction-Timber, Wood joints- Lap, dovetail, Tools- Marking tools, Cutting tool, Finishing tools-etc- basic carpentry operations, Wood turning lathe

Unit-IV

Plastic molding & Glass Cutting: Types of Plastics, Processing of Plastics: Injection moulding and Blow moulding. Introduction to Glass materials and physical properties -Cutting tools.

Unit-V

Casting: Importance, Advantages and limitations, Pattern, Sand Casting – Casting terms, Procedure, Applications, Die Casting– Principle and Applications,

Metal joining - Various methods of Joining, Welding - Types of Welding - Weld joints, Arc welding – Principle, Coated electrode, arc welding equipment, Applications, Resistance Spot welding, Soldering and Brazing

Sheet Metal Operations - Punching, Blanking

Unit-VI

Machining: meaning, Advantages and Drawbacks, Basic concepts of machine tool, chips and cutting tool, Principle of Lathe, Drilling, and Grinding, CNC machine tools - Advantages, parts of a CNC system, Additive manufacturing – Need, principles of SLS, FDM methods

Text Books:

1) Hajra Choudhury S.K., HajraChoudhury A.K. and Nirjhar Roy S.K.,
2)) Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.

Reference Books:

Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

L	T	P	C
0	0	2	1

1	2	3	4	5	6	7	8	9	10	11	12
L			H								

8HC64 Engineering CHEMISTRY LABORATORY

I B. Tech I Sem (for CSE, ECE and CE)

I B. Tech II Sem (for EEE, ME, IT and ECM

Course Objectives:

The student will be able to learn:

1. To reparation of Inorganic compounds
2. To determine surface tension of a liquid
3. To determine viscosity of lubricant
4. To determine acid value of an oil
5. To estimate hardness of water
6. To analyze the amount of chloride content
7. To determine cell constant and conductance of solutions
8. To determine redox potential and emf of solutions
9. To determine the rate constant of acid
10. To synthesize a polymer (Thiakol rubber / Urea-Farmaldehyde resin)
11. To synthesize a drug- Aspirin
12. To estimate of Mn^{+7} by Colorimetry method

List of Experiments

1. Preparation of coordination complex NiDMG Complex
2. Determination of surface tension
3. Determination of viscosity
4. Saponification/acid value of an oil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTA Method
6. Determination of chloride content of water
7. Determination of cell constant and conductance of solutions (HCl Vs NaOH / Mixture of acid Vs Strong base)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$ Vs $KMNO_4$ / HCl Vs NaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis of methylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyde resin
11. Synthesis of a drug- Aspirin
12. Estimation of Mn^{+7} by Colorimetry method

Course Outcomes

After completion of the course, the student will be able to learn:

1. Preparation of Inorganic compounds
2. Determination surface tension of a liquid
3. Determination viscosity of lubricant
4. Determination acid value of an oil
5. Estimation hardness of water
6. Analysis the amount of chloride content
7. Determination of cell constant and conductance of solutions
8. Determination of redox potential and emf of solutions
9. Determination of the rate constant of acid
10. Synthesis of a polymer (Thiakol rubber / Urea-Farmaldehyde resin)
11. Synthesis of a drug- Aspirin
12. Estimation of Mn^{+7} by Colorimetry method

1	2	3	4	5	6	7	8	9	10	11	12
		M		H							L

Problem Solving using C Lab
(Common to All Branches)

Code: 8FC61

L	T	P	C
0	0	2	1

Course Objectives:

To be able to understand the fundamentals of programming in C Language
To be able to write, compile and debug programs in C
To be able to formulate problems and implement in C.
To be able to effectively choose programming components
To solve computing problems in real-world.

Course Outcomes:

After completion of this course student will learn

1. To formulate the algorithms for simple problems
2. To translate given algorithms to a working and correct program
3. To be able to correct syntax errors as reported by the compilers
4. To be able to identify and correct logical errors encountered at run time
5. To be able to write iterative as well as recursive programs
6. To be able to represent data in arrays, strings and structures and manipulate them through a program
7. To be able to declare pointers of different types and use them in defining self referential structures.
8. To be able to create, read and write to and from simple text files.

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

1. Unit I (Cycle 1)

1. Write an algorithm for converting a given Celsius temperature to its equivalent Fahrenheit temperature and draw a flowchart.
2. Write an algorithm to find the largest of three given numbers and draw a flowchart.
3. Write an algorithm and draw a flowchart for finding the roots and nature of roots of a quadratic equation, given its coefficients.
4. Write an algorithm and flowchart for finding the first n Fibonacci numbers, give n.

2. Unit II (Cycle 2)

1. Write an algorithm, flowchart, and C program for:
2. Finding the area and circumference of a circle of given radius.
3. Finding the volume of a sphere of given radius.

4. Finding the lateral surface area of a right circular cone of given base radius and height.
5. Finding selling price of an item, given its cost price and profit percent.
6. Finding the interest on a given principal for a given period of time at a given rate of per year.
7. Write a C program to display all the sizes of data types in C.
8. Write a C program to display a given decimal integer into an equivalent octal number and hexadecimal number using %o and %x in printf function.

3. Unit II (Cycle 3)

1. Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.
2. Write a C program for finding the largest of three given numbers.
3. A salesman gets a commission of 5% on the sales he makes if his sales is below Rs.5000/- and a commission of 8% on the sales that exceeds Rs.5000/- together with Rs.250/-. Write an algorithm or a flowchart and develop C program for computing the commission of the salesman, given his sales.
4. Write a C Program to demonstrate Marcos.

4. Unit III (Cycle 4)

1. Write three C programs to print a multiplication table for a given number using while, do-while, and for loops.
2. Write a C program to compute the sum of:
3. $1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$, given x and n.
4. 1! + 2! + 3! + . . . + n!, given n.
5. $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! + \ldots$ to n terms where the n^{th} term becomes less than 0.0001.

5. Unit III (Cycle 5)

1. Write a C program in the menu driven style to perform the operations +, -, *, /, % between two given integers.
2. Write a C program to find the largest and the least of some numbers given by the user.
3. Write a C program to find the sum of the digits of a positive integer.

6. Unit III (Cycle 6)

1. Write C functions for the following:

a) A function that takes an integer n as argument and returns 1 if it is a prime number and 0 otherwise.
b) A function that takes a real number x and a positive integer n as arguments and returns x^n.
c) A function that takes a positive integer n as an argument and returns the n^{th} Fibonacci number.

2. Using recursion write C functions for the following:
   a) Factorial of a non-negative integer n.
   b) Number of combinations of n things taken r at a time.
   c) Greatest Common Divisor of two integers.
   d) Least Common Multiple of two integers.

7. Unit III (Cycle 7)

a) Write a menu driven style program to compute the above functions (cycle 6) on the choice of the function given by the user.

b) Define macros for the following and use them to find sum of the squares of the minimum and maximum of two given numbers.

   a) Larger of two numbers.
   b) Smaller of two numbers.
   c) Sum of the squares of two numbers.

c) Write a program to generate Pascal's triangle.

d) Write a program to count the number of letters, words, and lines in a given text.

8. Unit IV (Cycle 8)

1. Write a program to store the numbers given by the user in an array, and then to find the mean, deviations of the given values from the mean, and variance.
2. Write a C program to initially store user given numbers in an array, display them and then to insert a given number at a given location and to delete a number at a given location.
3. Write a program to store user given numbers in an array and find the locations of minimum and maximum values in the array and swap them and display the resulting array.

9. Unit IV (Cycle 9)

1. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
2. Write a program to find whether a given matrix is symmetric, lower triangular, upper triangular, diagonal, scalar, or unit matrix.

10. Unit V (Cycle 10)

1. Write a function to swap two numbers.
2. Write a function to compute area and circumference of a circle, having area and circumference as pointer arguments and radius as an ordinary argument.

11. Unit VI (Cycle 11)

1. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, absolute value, multiplication, division, complex conjugate) and implement them in a menu driven style.
2. Define a structure point. Write a program to find the distance between two points.
3. Define a structure student having members roll no., name, class, section, marks. Create an array of 10 students give the data and find the average marks, section-wise.

12. Unit VI (Cycle 12)

1. Write a program to:

a) Create a file by the name given by the user or by command line argument and add the text given by the user to that file.

b) Open the file created above and display the contents of the file.

c) Copy a file into some other file, file names given by the user or by command line arguments.

d) Append a user mentioned file to another file.

e) Reverse the first n characters of a file.

1	2	3	4	5	6	7	8	9	10	11	12
		M		H							L

WORKSHOP/MANUFACTURING PROCESSES LAB

Code :

L	T	P/D	C
0	0	2	1

COURSE OBJECTIVES:

1) To know the different popular manufacturing process
2) To gain a good basic working knowledge required for the production of various engineering products
3) To provide hands on experience about use of different engineering materials, tools, equipment's and processes those are common in the engineering field
4) To identify and use marking out tools, hand tools, measuring equipment and to work to prescribed tolerances

COURSE OUTCOMES:

After completion of the course, the student will be able to:

CO-1: Use various types of conventional manufacturing Processes

CO-2: Manufacture components from wood, MS flat, GI Sheet etc. – hands on experience

CO-3: Manufacturing of components by machining like shafts, holes & threaded holes, surface finishing of components etc.

CO-4: Produce small devices / products /appliances by assembling different components

LIST OF EXPERIMENTS

S.No	Trades	Experiment name
1	Fitting Shop	**1**. Preparation of T-Shape Work piece **2.** Preparation of U-Shape Work piece which contains: Filing, Sawing, Drilling, Grinding.
2	Carpentry	3. Cross Half Lap joint 4. Half Lap Dovetail joint
3	Electrical & Electronics	5. One lamp one switch 6. Stair case wiring
4	Welding (Arc & Gas) & Soldering	7. Practice of Lap and Butt joint by Arc welding Demonstration: Gas welding, Resistance welding & Soldering
5	Casting	8. Preparation of mould cavity using solid pattern 9. Preparation of mould cavity using split pattern Demonstration: pouring of molten metal
6	Tin Smithy	10. Preparation of Rectangular Tray 11. Preparation of Square box
7	Machine Shop	Turning, Drilling and grinding operations on Lathe, Drilling and grinding machines
8	Plastic molding & Glass Cutting	12 a) Injection Moulding b) Glass Cutting with hand tools
9	Domestic Appliances	Study of internal components & circuit of appliances such as Fans, Mixers, Air blower, Iron box, Rice cooker, Emergency light etc.,
10	Lab project	Making various components and / or assembling the components which can be useful in domestic / engineering applications

1	2	3	4	5	6	7	8	9	10	11	12
								L	H		M

H: High M: Medium L: Low

Syllabus for B. Tech I Year I Semester
Civil Engineering
TECHNICAL SEMINAR –I

Code: 8K191	**L**	**T**	**P**	**C**
	-	**-**	**2**	**1**

Course Objective :

1. Develop ability to be a public speaker with the aid of Power Point Presentations.
2. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts.
3. Practice and develop communication skills and interview performance skills.

Course Outcomes:

1. Demonstrate public speaking with the aid of Power Point Presentations
2. Identify current general and specific technological topics of interest and prepare and present the content cogently.
3. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Content	: 20 marks
Presentation including PPT	: 20 marks
Seminar Notes	: 10 marks
Interaction	: 10 marks
Report	: 25 marks
Attendance	: 10 marks
Punctuality	: 5 marks
Total	**100 marks**

a	B	c	d	e	f	g	h	i	j	k	l
X				X			X				

B.TECH. I YEAR I SEM (Mechanical) & II SEM (Civil)

		L	T	P	C
Code: 8HC06	**APPLIED PHYSICS (Theory)**	**3**	**1**	**0**	**4**

Course Objectives

- To understand basic fundamentals of crystallography, crystal structures, their properties
- To understand the various defects of a crystal and straining hardening.
- To know the various types of vibrations like periodic, vibrating strings, radius of gyration, moment of inertia, Ultrasonics, Magnetostriction, Piezo-electricity, NDT.
- To make the students to widen the conceptual understanding of the fundamental principles of interference and diffraction (wave optics)
- To understand the basic concepts of normal light, Laser and its applications and to know about the fundamentals of radioactivity and its applications.
- To discuss about the nano-technology, preparation techniques and characterization (XRD, SEM & TEM), CNTs

Unit:1
Crystallography and Crystal structures and their relative properties

Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Atomic Radius, Co-ordination Number and Packing Factor, different metals which classified as SC, BCC, FCC, HCP structures and their relative properties, deformation and corresponding strength and ductility, Crystal Planes, directions and Miller Indices, Inter Planar Spacing of Orthogonal Crystal Systems.

Unit:2
Crystal Defects

Point Defects - Vacancies, Substitutional, Interstitial, Frenkel and Schottky Defects-Calculation of concentrations, Qualitative treatment of line/Edge and Screw Dislocations, Burger's Vector, The phenomenon of Strain hardening.

Unit:3
Mechanical Vibrations and Ultrasonics

Undamped, Damped, Forced vibrations and resonance (qualitative), Frequency of vibrating strings, Radius of gyration, moment of inertia, calculation of moment of inertia of rigid bodies by integration-circular disc, solid sphere, solid cylinder, thin rod and rectangular lamina, Applications:

Physical Pendulum, Torsional Pendulum, Compound Pendulum, Sonometer and Melde's arrangement.

Production of Ultrasonics

By Magnetostriction effect method and piezoelectric effect method, Applications of Ultrasonics.

Unit:4

Wave optics and applications

Interference: Introduction, Superposition of waves, Young's double slit experiment, Intensity calculation, fringe width, Interference in thin films due to reflection of light, Newton's rings. Applications: Calculation of Refractive Index of liquid, Thickness of glass plate.

Diffraction: Introduction, Plane diffraction grating (Qualitative), Theory of plane transmission grating, Resolving power of a grating - Application; calculation of wavelength of spectral light by using grating.

Unit:5

Lasers and Nuclear Energy

Lasers

Characteristics of LASER, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, pumping, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them and significance, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers in medicine and engineering.

Nuclear Energy: Radioactivity, Nuclear binding energy, Nuclear fission, Nuclear fusion, α, β, γ rays decay, Introduction of nuclear power plant, Geiger-Muller counter and practical applications of nuclear physics.

Unit:6

Nanotechnology

Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication, Sol-gel, Precipitation, Chemical vapor Deposition(CVD); Top-down Fabrication; Thermal evaporation, Ball Milling, Characterization of Nano materials (XRD&TEM), carbon nano tubes(CNTs), Applications of Nano Materials.

Text Books:

1. M.N. Avadhanulu, P.G. Kshirsagar and TVS Arun Murthy, Engineering Physics, S. Chand publications.

Reference Books:

1. Charles Kittel, Introduction to Solid State Physics, John Wiley Publisher
2. Dekker, Solid State Physics
3. Halliday and Resnick, Physics
4. Engineering Mechanics by S.S. Bhavikatti & J.G. Rajasekharappa.
5. Theory of Vibrations with Applications – WT Thomson
6. S.O. Pillai, Solid State Physics
8. A. Ghatak – Optics

Course Outcomes

After completing the course, students are able to

- Get the knowledge to classify the crystal structures, their parameters and draw the various crystal planes using Miller indices.
- Understand and analyze the various crystal defects-its types, strain hardening.
- Understand about the vibrations, periodic motion, radius of gyration, moment of inertia and apply the knowledge of ultrasonic, non destruction testing, Magnetostriction, Piezo-electricity.
- Analyze the wave nature and its types, superposition principle, differentiation between interference, diffraction and their applications
- Explain about emission, its types, laser principle, types, working and its applications and also to understand the radioactivity, fusion & fission, alpha, beta and gamma rays decay and its applications.
- Summarize nano & bulk concepts, surface to volume ratio, quantum confinement, CNTs and preparation methods (physical & chemical), analysis the techniques like XRD, SEM, TEM

1	2	3	4	5	6	7	8	9	10	11	12
X								X			X

Syllabus for B. Tech I Year II Semester
Civil Engineering
Engineering Mechanics (For Civil Engineering)

Code: 8K201

L	T	P	C
3	1	0	4

Course Objective :

4. To make the students understand the concepts of Force system, Resultant of Force systems, Components of Force, Moments, and Couples in plane and in space and Free body diagrams
5. To introduce the students the concepts of friction, including types of friction, and analysis of simple trusses and frames and give them a foundation on these topics.
6. To make the students understand the concepts of Centroid and Area and Mass Moments of Inertia and make them learn how to calculate the centroid of various geometrical shapes and Area and Mass Moments of Inertia of different shapes and objects.
7. To make the students learn the principles of virtual work and energy method in analyzing and solving equilibrium problems involving rigid bodies acted upon by various forces
8. To make the students learn particle kinematics and kinetics concepts involving rectilinear and curvilinear motions in different coordinate systems
9. To make the students learn rigid body dynamics involving plane motion including rotation and application of work energy principle in plane motion of connected bodies.

Course Outcomes:

After completing the course, students will be able:

1. To analyse the system of forces and draw free body diagrams to solve problems dealing with a system of forces in a plane
2. To understand the concept of friction and types of friction such as wedge friction; to analyse plane frames and solve it using either the method of joints or the method of sections
3. To understand concepts of Centroid and center of gravity and able to compute CG for simple and compound shapes; to understand the concept of Moment of Inertia, Mass moment of Inertia and able to compute MI for various regular and composite shapes and bodies
4. To understand the concept of virtual work and apply the concept for equilibrium condition.
5. To understand and perform analysis of motion under kinematics such as rectilinear and curvelinear translation of a particle or of a rigid body
6. To understand anlaysis of a body under dynamics such as work energy principle for translation and fixed axis rotation, understand inpulse and momentum concepts

UNIT-I

Introduction to Engineering Mechanics: Force Systems, Basic concepts and axioms, Rigid Body equilibrium, System of Forces, Coplanar Concurrent Forces, Lami's theorem, Components in Space – Resultant of Force System; Moment of Forces and its Application;

Varignon's principle; Couples; Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems and Spatial Systems; Static Indeterminacy.

UNIT-II

Friction: Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Motion of Bodies, wedge friction, Belt Friction, screw jack & differential screw jack.

Basic Structural Analysis: Equilibrium in three dimensions; Method of Sections; Method of Joints; Simple Trusses; Frames.

UNIT-III

Centroid and Centre of Gravity: Centroid of simple figures from first principle, centroid of composite sections; Centre of Gravity and its implications;

Moment of Inertia: Area moment of inertia- Definition, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections; Mass moment inertia of circular plate, Cylinder, Cone, Sphere, Hook.

UNIT-IV

Virtual Work and Energy Method: Virtual displacements, principle of virtual work for particle and ideal system of rigid bodies, degrees of freedom. Active force diagram, systems with friction, mechanical efficiency. Conservative forces and potential energy (elastic and gravitational), energy equation for equilibrium. Applications of energy method for equilibrium. Stability of equilibrium.

UNIT-V

Particle Dynamics: Rectilinear motion; Plane curvilinear motion (rectangular, path, and polar coordinates). 3-D curvilinear motion; Relative and constrained motion; Newton's Second law (rectangular, path, and polar coordinates). Work-kinetic energy, power, potential energy. Impulse-momentum (linear, angular); Impact (Direct and oblique).

UNIT-VI

Introduction to Dynamics of Rigid Bodies: Basic terms, general principles in dynamics; Types of motion, Instantaneous centre of rotation in plane motion and simple problems; D'Alembert's principle and its applications in plane motion and connected bodies; Work energy principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation;

TEXT BOOK

1. K. Vijay Kumar Reddy and J. Suresh Kumar, Singer's Engineering Mechanics, BS Publications, Hyderabad, 2011

REFERENCES

1. Engineering Mechanics by S.P. Timoshenko, D.H.Young&J.V.Rao, Tata McGraw Hill Publishers,4th Edition,2010
2. Engineering Mechanics by S.S. Bhavikatti, Newage International Publishers,2012
3. Engineering Mechanics (Statics) by J.L.Meriam&L.G.Kraige, Wiley Publishers, 6th Edition,2006
4. Engineering Mechanics by A.K.Tayal, Umesh Publications,13th Edition,2010
5. Engineering Mechanics by R.K. Rajput, laxmi Publications,1998

a	b	c	d	e	f	g	h	i	j	k	l
H	M	M								L	

I Year B.Tech, Semester-II

DIFFERENTIAL EQUATIONS & INTEGRAL CALCULUS

(Common to ME & CE)

	L	T	P/D	C
Code: 8HC12	**2**	1	**0**	**3**

Course Objectives: *To make the students to understand and expected to learn*

1. *Various analytical methods to solve first order and first degree ordinary differential equations.*
2. *Methods to solve higher order ordinary differential equations.*
3. *Formation of partial differential equation and to solve linear and non-linear differential equations.*
4. *Method of separation of variables in finding solution of heat and wave equations.*
5. *To evaluate double and triple integrals.*
6. *Evaluation of surface and volume integrals.*

Syllabus

UNIT - I: First order ordinary differential equations: (10 L)

Exact, equations reduced to exact; linear and Bernoulli's equations; Orthogonal Trajectories, Newton's Law of Cooling, Law of natural Growth/Decay.

UNIT - III: Ordinary differential equations of higher order: (10 L)

Higher order linear differential equations with constant coefficients-Standard types of finding P.I, method of variation of parameters, Cauchy-Euler equation.

UNIT– III: First Order Partial Differential Equations: (10L)

Formation of Partial Differential Equations by Elimination of Arbitrary Constants and Arbitrary Functions. Solutions to First order Linear and Non-linear Equations-Standard Forms, Equations Reducible to Standard Forms.

(PTO)

UNIT-VI: Higher Order Partial Differential Equations: (10L)

Classification of partial differential equations. Method of Separation of Variables. Initial and Boundary conditions, Solutions of One dimensional wave, Heat equations and Laplacian equation in Cartesian form.

UNIT - V: Multiple Integrals (10L)

Double integrals, change of order of integration, change of variables (Cartesian to polar), Triple integrals (Cartesian), Applications in finding areas and volumes.

UNIT - IV: Vector Integral Calculus (10 L)

Line integrals, Surface integrals, Volume Integrals, Green, Gauss divergence and Stokes theorems (without proofs).

Text Books:

1. R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.

Reference Books:

(i) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

(ii) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

(iii) Engineering Mathematics, Srimanta Pal, OXFORD university press.

(iv) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

Course Outcomes: *After the course completion the students will be able to*

(i) Find the solutions of first order first degree and not of first degree differential equations and their applications such as Newton's law of cooling, Natural growth and decay.

(ii) Identify and solve higher order ordinary differential equations with constant coefficients using some standard methods and also their applications in vibration of motion.

(iii) Solve first order partial differential equations.

(iv) Solve the problems of Heat and wave equations.

(v) Evaluate multiple integrals

(vi) *To solve problems of surface and volume integrals.*

1	2	3	4	5	6	7	8	9	10	11	12
H	M	M									

Syllabus for B.Tech. I year II Semester
8EC01 - DATA STRUCTURES and C++
(Common to all Branches)

Course Objective:

1. Understand the concepts of Abstract data Type, linear data structures such as stacks, queues and lists and their applications.
2. Comprehend different nonlinear data structures such as trees and graphs and analyze their time complexities.
3. Understand object-oriented programming and advanced C++ concepts and be able to write programs with C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, Templates etc.

Course Outcomes:

1 Explain Abstract data type, stack and Queues with their applications

2 Write programs on Singly linked lists, doubly linked lists, Circular list and explain their operations.

3 Explain concepts of Trees, AVL Trees and Graphs with examples and applications.

4 Describe and solve problems of searching and sorting and evaluate the time complexity of each algorithm.

5 Explain concepts of OOPs and implement programs using objects, classes, constructors and destructors.

6 Explain and apply concepts of oops, write programs implementing functions, operator overloading and inheritance.

UNIT I:

Introduction to data structures: Abstract data type (ADT), Stacks, Queues and Circular queues and their implementation with arrays.

Applications of Stack: infix to post fix conversion, postfix expression evaluation.

Applications of Queues.

UNIT II:

Singly linked lists, Advantages of Linked lists over Arrays, Doubly linked lists, Circular list and their operations, representing stacks and queues with Linked lists.

UNIT III:

Trees- Binary trees, terminology, representation, traversals. AVL trees, AVL tree operations: Insertion, deletion and searching. Graphs- terminology, representation, graph traversals (DFS and BFS).

UNIT IV:

Searching –Searching: Linear and binary search methods.

Sorting: Quick sort, Merge sort.

Performance analysis of Searching and Sorting Algorithms. Heaps: Introduction, Min Heap, Max Heap, Operations on Heaps, Heap Sort. Hashing: Hash Table, Hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing.

UNIT V:

Introduction to C++ programming-object oriented programming concepts, Structured Vs OOP. Classes and objects-class definition, Objects, class scope and accessing members, Constructors-default constructor, parameterized constructor, copy constructor. Destructor.

UNIT VI:

Static class members, this pointer, friend functions, Dynamic memory management with operators new and delete. Overloading-function overloading, Operator overloading, restrictions on operator overloading, overloading unary and binary operators, templates, inheritance: single, multiple and multi level inheritance.

EXT BOOKS:

Data Structures and C++ by Reema Thareja
Data Structure through C by Yashavant Kanetkar.
The complete reference C++ By HerbSchildt.

REFERENCES:

1. Alfred V. Aho, Jeffrey D. Ullman, John E. Hopcroft. Data Structures and Algorithms. Addison Wesley, 1983.
2. Data Structures using c Aaron M.Tenenbaum , Yedidyah Langsam,Moshe J Augenstein.
3. Introduction to Data Structures in C By Kamtane
4. Data Structures, A pseudocode Approach with C by Richard F. Gilberg and Behrouz A. Forouzan.

Syllabus (A-20 Regulation)
Written Communication Skills

IT, MECH, ECM, EEE: I/I
CSE, ECE, CIVIL: I/II

Subject Code: 8HC02
L – T –P/D – C
1 0 0 1

Lab Code: 8HC62
L – T –P/D - C
0 0 2 1

Maximum Marks: 100 (Internal – 30 / External – 70)

1	2	3	4	5	6	7	8	9	10	11	12
							L	L	H		L

Course Objectives:
To enable students to:

- upgrade their knowledge of basic writing skills, writing cohesive paragraphs and effective letters.
- differentiate between confusing words, learn correct spellings and have a sound grip over the use of phrasal verbs.
- master the techniques of reading passages and comprehending them.
- understand the nuances of technical communication and apply it in their academic and professional career.
- acquaint themselves with soft skills like having the right attitude towards life and boosting self-confidence.
- learn the importance of building strong resume and the ways of building it.

Unit: 1
Effective Written Communication:
1.1 Strategies for effective written communication
1.2 Paragraph Writing
1.3 Letter Writing/ E- Correspondence

Unit: 2
Basic writing skills emphasizing Verbal Aptitude:
2.1 Words often confused
2.2 Synonyms – Antonyms
3.2 Homophones, Homonyms, Homographs

2.4 One - word substitutes
2.5 Idioms and Phrases

UNIT : 3
Reading Comprehension:
3.1 Skimming and Scanning
3.2 Prediction Techniques and Inferring
3.3 Literal Comprehension

3.4 Evaluative Comprehension
3.5 Inferential Comprehension

UNIT: 4
Technical Communication:
1 Definition and Importance of Technical Communication/Business Communication
4.2 Types of Technical Communication and Comprehension
4.3 Report Writing: Significance, types, steps, layout and mechanism
4.4 Review of technical articles

UNIT: 5
Soft Skills:
5.1 Introduction to Soft Skills
5.2 Attitude: Attitude Vs. Behaviour; Factors leading to the formation of Attitude Negotiation and winning by influence

UNIT: 6
Resume Writing:
6.1Types, purpose and design of Résumé
6.2Differences among Bio-data, Curriculum Vitaé and Résumé
6.3Tips to build a winning Résumé and write and effective cover letter
6.4 Cover Letter

Text book :
Compiled by the faculty of English (for internal circulation only).

Reference books:
- English for Professionals by S.S.Prabhakar Rao
- English for Technical Communication by K.R.Lakshminarayana
- English for Business Communication by Dr.T.Farhathullah
- Professional Communication by Alok Jain, Pravin S.R.Bhatia and A.M.Sheikh
- Business Communication, Principles to Practice- Monipally.
- Advanced Technical Communication: Kavita Tyagi and Padma Mistri

1	2	3	4	5	6	7	8	9	10	11	12
		M		H							L

ENGINEERING GRAPHICS

Code: 8BC02

L	T	P/D	C
1	0	4	3

Course objectives:

1: To teach students the basic principles of Engineering graphics and instruments used

2: To introduce the concept of projections in drawing and its applications for simple drawing entities

3: To impart the knowledge of various types of solids and their projections in different position wrt principle planes

4: To teach the concept of sections of solids and their applications

5: To develop a clear understanding of the basic principles involved in three dimensional Engineering drawings.

6: To train the students for the extraction of multiple views from a solid model using AutoCAD

Course outcomes

After completing this course, the student will able to:

1) Get familiar to use the instruments to solve the engineering problem and draw various type of curves used in engineering
2) Understand and Implement Orthographic projections and draw projections of simple drawing entities such as points Lines, and Planes
3) Draw projections of different types of regular solids in various positions wrt principal planes of projection
4) Draw Sections of various Solids including Cylinders, cones, prisms and pyramids and draw the developments of these solids and their sections.
5) Construct Isometric Scale, Isometric Projections and Views and convert 3D views to 2D orthographic views
6) Understand from basic sketching through 2D and 3-D solid modeling using computer aided design (CAD) software

UNIT – I

Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, Lettering, Dimensioning-Terms & notations, placing of dimensions, general rules of dimensioning.

Curves used in Engineering Practice and their Constructions:

Conic Sections including Rectangular Hyperbola - General method, Cycloid and Involutes of circles

Scales: Reducing, Enlarging and Full Scales, types of scales, Construction of plain scales and diagonal scales only-simple problems

UNIT – II

Orthographic Projection: Principles of Projection – Methods of projection, First angle and third angle projections, Projections of Points, Projections of straight lines –line inclined to one plane and line inclined to both reference planes

UNIT –III

Projections of regular Planes: types of planes, plane inclined to one reference plane, Oblique planes

Projections of regular Solids: types of solids, Projections of: Prisms, Cylinders, Pyramids, Cones – simple position and axis inclined to one plane only

UNIT –IV

Sections and sectional views of Solids: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

Development of Surfaces: Methods of development, Development of lateral Surfaces of Right Regular Solids – Prisms, Cylinders, Pyramids, Cones and their sections.

UNIT – V

Isometric Projection: Meaning, Isometric axes, lines and planes, Isometric Scale – Isometric drawing or View – Isometric drawing of planes and simple solids such as prisms, pyramids, cylinder, cone

UNIT –VI

Conversion of isometric views to orthographic views of simple objects.

(Demonstration only) Overview of Computer Graphics : Demonstrating features of the CAD software - The Menu System, Toolbars, , Dialog boxes and windows, Drawing entities - lines, circles, arcs etc and editing commands, Dimensioning of objects, 2 D drawings-simple exercises , 3D wire-frame and shaded solids- Commands, Boolean operations.

TextBook:

Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House (In First-angle Projection Method)

Reference Books:

1) Shah, M.B. &Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

2) Agrawal B. &Agrawal C. M. (2012), Engineering Graphics, TMH Publication

3) AUTOCAD Software Theory and User Manuals

a	b	c	d	E	f	g	h	i	j	k	l
X		X									

B.TECH. I YEAR I SEM (Mechanical) & II SEM (Civil)

		L	T	P	C
Code: 8HC65	**APPLIED PHYSICS LAB**	**0**	**0**	**2**	**1**

Course Objectives

- To explain about magnetic induction, Biot-Savart principle – Magnetism.
- To study the LED characteristics and forward resistance – Semiconductor devices.
- Explaining about the electrical resonance by using the LCR circuit – Electrical / resonance.
- To know the time constant of RC circuit - Electrical.
- Explain about the acceleration due to gravity and radius of gyration and periodic vibrations-Compound Pendulum – Vibrations.
- To understand the rigidity modulus-Torsional pendulum – Vibrations.
- Discuss the dispersive power of prism-minimum deviation method – Light.
- Explain the formation of Newton's rings-interference – Light.
- Discussion of diffraction pattern using the grating – LASER.
- To understand about the ionizing radiation by using the Geiger–Muller counter – Nuclear energy.
- To understand the transverse laws of vibrations-Sonometer – Resonance.
- To explain the electrically vibrating the tuning fork by using Melde's experiments – Electromagnetism.

List of Experiments

1. Determination of magnetic induction flux density along the axis of a current carrying circular coil using Stewart and Gee's experiment.
2. Studying the characteristics and calculating the forward resistance of a LED.
3. Study of series and parallel resonance of an LCR circuit.
4. Determination of time constant of an RC-circuit
5. Determination of acceleration due to gravity and radius of gyration using compound pendulum.
6. Determination of rigidity modulus of a given wire material using the Torsional pendulum.
7. Calculation of dispersive power of a given material of prism by using spectrometer in minimum deviation method.

8. Determination of wavelength of a monochromatic light source by using Newton's rings experiment.
9. Determination of wavelength of a given laser source of light by using diffraction grating in normal incidence method.
10. Studying the characteristics of Geiger–Muller counter and verifying the inverse square law.
11. Verification the transverse laws of stretched strings by using the Sonometer.
12. Determination of frequency of an electrically vibrating tuning fork using the Melde's experiment.

NOTE: Any **TEN** of the above experiments are to be conducted.

Course Outcomes

After completing the experiment, students are able to

- Understand and search to apply the fundamentals of magnetic induction, Ampere's law, Oersted's law and the Biot-Savart law.
- Analyze the difference between normal diode, LED, forward bias, reverse bias, I-V characteristics, direct and indirect band gap semiconductors.
- Analyze the LCR circuit combination, parallel, series electrical resonance, inductance, reactance, capacitance and electrical and electronic fundamentals.
- Characterize the RC network, time constant, capacitor functioning and its application.
- Analyze the concept and application parts of radius of gyration and periodic vibrations.
- Summarize the fundamentals of modulus-types, stress, strain, elasticity, plasticity and Hook's law.
- Know about the light properties-dispersion, prism, spectrometer and minimum deviation arrangement.
- Understand the concepts of interference, conditions, formation of Newton's rings-reason.
- Recognize the difference between the interference and diffraction, grating, laser characteristics.
- Understand the concept of radiation, ionizing radiation, radiological protection and inverse square law.
- Demonstrate the resonance phenomenon and verify the transverse laws of stretched strings by using Sonometer.
- Describe the types of waves like longitudinal, transverse, stationary and progressive waves. Electromagnetic induction and its applications.

1	2	3	4	5	6	7	8	9	10	11	12
		M		H							L

Syllabus for B.Tech. I year II Semester
8EC61 - DATA STRUCTURES (C/C++) LAB
(Common to all Branches)

Course objective:
Understand the data structures: simple and complex and use them to write the programs for implementing searching, sorting, expression evaluations. Understand the applications that use the particular data structure and its significance in the development of operating systems and the softwares . Understand the object-oriented programming concepts of C++.

Course Outcomes:
1 Write programs to implement Stacks, Queues and circular queues.
2 Write programs using tree traversals. Inorder, preorder and post order.
3 Write Programs on searching, sorting and hashing operations.
4 Write programs on Binary trees
5 Write programs in C++ to implement classes and operator overloading.

UNIT –I:
1. Write a C program that implement stack and its operations using arrays
2. Write a C program that implement Queue and its operations using arrays.
3. Write a C program that implement Circular Queue and its operations using arrays.
4. Write a C program that uses Stack operations to perform the following
   i) Converting infix expression into postfix expression
   ii) Evaluating the postfix expression

UNIT –II:
5. Write a C program that uses functions to perform the following operations on singly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
6. Write a C program using functions to perform the following operations on circular singly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal
7. Write a C program that uses functions to perform the following operations on doubly linked list:
   i) Creation ii) Insertion iii) Deletion iv) Traversal in both ways
8. Write a C program to implement operations on the following Data Structures Using Singly linked list:
   i) Stack ii) Queue

UNIT- III
9. Write a C program that uses functions to perform the following:
   i) Creating a Binary Tree of integers
   ii) Traversing the above binary tree in preorder, in order and post order.

UNIT- IV
10. Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
    i) Linear search ii) Binary search

11. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Bubble sort ii) Insertion sort iii) Selection Sort

12. Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
    i) Quick sort ii) Merge sort iii) Heap Sort

13. Write a C Program to implement Separate Chaining using Hashing. Include Insertion, Deletion and Display of the Elements.

UNIT –V

14. Write a C++ program to read and display the details of student class with data members as name, rollno and 3 subjects' marks.

15. Write a C++ program to implement all types of constructors.

UNIT VI

16. Write a C++ program to implement operator overloading for addition of two complex numbers.

1	2	3	4	5	6	7	8	9	10	11	12
								L	H		M

H: High M: Medium L: Low

Syllabus for B. Tech I Year II Semester
TECHNICAL SEMINAR –II

Code: 8K291

L	T	P	C
-	-	2	1

Course Objective :

1. Develop ability to be a public speaker with the aid of Power Point Presentations.
2. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts.
3. Practice and develop communication skills and interview performance skills.

Course Outcomes:

1. Demonstrate public speaking with the aid of Power Point Presentations
2. Identify current general and specific technological topics of interest and prepare and present the content cogently.
3. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Content	: 20 marks
Presentation including PPT	: 20 marks
Seminar Notes	: 10 marks
Interaction	: 10 marks
Report	: 25 marks
Attendance	: 10 marks
Punctuality	: 5 marks
Total	**100 marks**

a	b	c	d	e	f	g	h	i	j	k	l
H	M	M								L	

II Year B. Tech, Semester-I

COMPLEX ANALYSIS, PROBABILITY AND STATISTICS

(Common to ME & CE)

	L	T	P/D	C
Code: 8HC15	**2**	**1**	**0**	**3**

Pre Requisites: Engineering Mathematics-II

Course Objectives: *To make the students to understand and expected to learn*

1. *Basic concepts of Complex Analysis and conformal mapping and their properties.*
2. *Series expansion of a function using Taylor's and Laurent's series. Evaluation of definite integrals and improper integrals.*
3. *Concepts of the probability, types of random variables and probability distributions.*
4. *Sampling distributions and their properties, concepts on estimation.*
5. *Concepts of Quality control methods.*
6. *Concepts on testing the hypothesis concerning to large samples. Different kinds of tests related to small samples and tests concerned to small size samples and goodness of fit and independence of attributes using chi-square distribution.*

Syllabus

UNIT - I: Complex Variable – Differentiation: (8 L)

Differentiation, analytic functions, Cauchy-Riemann equations, harmonic functions, finding harmonic conjugate. Conformal mapping: Translation, Inversion, Rotation and Magnification, Invariance of circles and cross ratio-Determination of bilinear transformation – mapping three given points.

UNIT - II: Complex Variable – Integration: (12 L)

Cauchy - Integral theorem (without proof), Cauchy Integral formula (without proof), singularities, zeros of analytic functions, Taylor's series, Laurent's series; Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral involving sine and cosine.

UNIT-III: Random Variables and Probability Distributions: (12L)

Conditional probability, Multiplication theorem, Baye's theorem (without Proof). Random variables – Discrete and Continuous, Probability Mass and Density Functions, Expectation and Variance. Probability Distributions: Binomial, Poisson and Normal Distributions.

(PTO)

UNIT-IV: SAMPLING DISTRIBUTIONS AND ESTIMATION: (8L)

Populations and Samples, Sampling distribution of the Mean (σ - known and Unknown), Sums and Differences, Central limit theorem. Estimation: Point Estimation and Interval Estimation concerning Means for Large Samples.

UNIT-V: Quality Control: (10 L)

Statistical Design of experiments: Basic concepts of CRD, RBD and Latin square designs.

Quality Control: Control Charts –Control lines, determination of control limits, Types of control charts-

Control charts for variables (mean chart, Range chart) – charts for attributes (fraction defective, no. of defectives and defects for unit)

UNIT-VI: Tests of Hypothesis for Small Samples: (10 L)

Tests of Hypothesis, Type–I and Type-II Errors, Hypothesis testing concerning one mean and two means and Test of Hypothesis concerning one Proportion and difference of proportions. Student t-test, Hypothesis testing concerning one mean and two means, F-test and χ^2 test-Goodness of fit, Independence of Attributes.

TEXT BOOKS:

1. Higher Engineering Mathematics, B.S. Grewal, Khanna Publications, New Delhi.
2. Probability and Statistics for Engineers: Miller and John E. Freund, PHI Publishers, 9th Edition

REFERENCE BOOKS:

1. Advanced Engineering Mathematics, S.R.K. Iyengar and R.K.Jain, Narosa Publication.
2. Probability and Statistics, T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham, M.V.S.S.N. Prasad, S. Chand Publications.
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, pearson Educations.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

Course Outcomes:

Students will able to

1. *Solve problems on analyticity and conformal mapping.*
2. *Evaluate Series expansions of a function using Taylor's and Laurent's series and also evaluation of definite integrals and improper integrals.*
3. *Solve problems on probability and will able to solve problems on discrete and continuous probability distributions.*
4. *Learn basic concepts of sampling distribution and able solve problems on estimation.*
5. *Solve problems on quality control.*
6. *Learn basic concepts of test of hypothesis and able solve problems.*

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H	M	L									

8K301: Solid Mechanics

B.Tech II Year I Sem.

L	T	P/D	C
2	1	-	3

Course Objectives:

1. To understand the basic concept of the stress and strain for different materials.
2. To know the mechanism of the development of shear force and bending moments in beams.
3. To analyze and understand flexural stress, direct and bending stresses.
4. To study deflection of beams, in different types of loadings and support conditions.
5. To understand the basic concepts of Principal Stresses and Strains
6. To study about Shear Stresses and Theories of Failure

Course Out comes:

At the end of the course the student should have learnt,

1. To evaluate the strength of concept of the stress and strain for different materials
2. To evaluate the behavior of different beams for Shear Force and Bending Moment diagrams
3. To evaluate the behavior and strength of flexural stress, direct and bending stresses
4. To evaluate the deflection of beams subjected to various loads.
5. To determine the Principal Stresses and Strainsin the members subjected to stresses
6. To evaluate the Shear Stresses and Theories of Failure.

UNIT – I

Simple Stresses and Strains: 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. Elastic constants.

UNIT – II

Shear Force and Bending Moment: 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, uniformly varying loads 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: Theory of simple bending – Assumptions – Derivation of bending equation: M/I = f/y = E/R - Neutral axis – Determination of bending stresses – Section modulus of rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections.

Direct and Bending Stresses: Stresses under the combined action of direct loading and bending moment, core of a section**.**

UNIT – IV

Deflection of Beams:

Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L, Uniformly varying load-Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT – V

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 and graphical solutions.

UNIT – VI

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

Theories of Failure: Introduction – Various theories of failure - Maximum Principal Stress Theory, Maximum Principal Strain Theory, Maximum shear stress theory- Strain Energy and Shear Strain Energy Theory (Von Mises Theory).

TEXT BOOKS:

1. Strength of Materials by Subramanian, Third Edition 2016, Oxford University Press, ISBN:0-19-946473-
2. Strength of materials by B.C. PUNMIA, Laxmi publishers TENTH EDITION JUNE 2013, ISBN 978-81-318-0925-9. [15 copies]

REFERENCES:

1. Mechanics of materials by Egor P Popov, Second Edition, Pearson, ISBN 978-93-325-5954
2. Strength of Materials by W.A Nash, MC Graw Hills 2014 6th edition.
3. Mechanics of Materials by James M Gere and Barry J GoodnoCengage Learning India Pvt. Ltd Eight edition.
4. Mechanics of Structures Vol –I by H. J. Shah and S. B. Junnarkar, Charotar Publishing House Pvt. Ltd.
5. Strength of Materials by S. S. Rattan, McGraw Hill Education Pvt. Ltd.
6. Fundamentals of Solid Mechanics by M. L. Gambhir, PHI Learning Pvt. Ltd.

1	2	3	4	5	6	7	8	9	10	11	12
H	M			L							L

8K302: SURVEYING AND GEOMATICS

B.Tech II Year I Sem.

L	T	P/D	C
3	0	---	3

Course objectives:

The student is being exposed to the subject with following Objectives:

1. Study the basic concepts and principles of surveying
2. Know the importance of compass, levelling survey and its practical applications
3. To understand the concept of Trigonometric levelling and applying the same for finding the elevations of object by various methods
4. To understand the importance of various curves and the methods of setting them.
5. Get acquainted with the principles and methods of Remote sensing and GIS/GPS surveying
6. Understand the theory of Aerial mapping

Course outcomes:

After studying this course, the students will be able to:

1. Calculate angles, distances using chain and tape
2. Identify data collection methods using a compass and enhance knowledge of the various field applications of levelling
3. Apply the concepts of Trigonometric levelling
4. Set out curves on the field and overcome obstructions in curve ranging
5. To apply the concepts of Remote sensing and GIS/GPS to Civil Engineering problems
6. Read Aerial maps and perform necessary calculations

UNIT – I

Introduction to Surveying, principles, linear, angular and graphical methods, Survey stations, Survey lines - Ranging, Calculation of Areas - Mid Ordinate, Average Ordinate, Trapezoidal and Simpsons methods

Applications: To calculate areas by measuring distances of ground features using various accessories

UNIT – II

Compass Surveying - Bearing of survey lines, Local Attraction, Declination, Dip
Leveling - Principles of leveling - Booking and reducing levels; Types of leveling, Digital and Auto Level, Errors in leveling
Contouring - Characteristics, methods, uses, areas and volumes

Applications: To measure distances and inclinations between different physical features on the ground.

UNIT – III

Theodolite survey - Instruments, Measurement of horizontal and vertical angle; Horizontal and vertical control - methods - Intervisibility of height and distances - Trigonometric leveling (Single and Double plane)

Triangulation - Network - Signals and Towers.Baseline - choices - instruments and accessories - extension of base lines - corrections - Satellite station - reduction to centre
Traversing - Methods of traversing, traverse computations and adjustments, Gale's traverse table, Omitted measurements

Applications: To estimate topographic and elevation details necessary for major construction sites such as highways, bridges, tunnels, and dams.

UNIT – IV
Tacheometric Surveying - Principle of Tacheometry, Distance measurement for horizontal Line of Sight
Curves - Types of curves and their necessity, Horizontal Curves - Elements of simple and compound curves - Method of setting them
Modern Field Survey Systems - Principle of Electronic Distance Measurement, Modulation, Types of EDM instruments - Total Station - Parts of a Total Station - Accessories - Advantages and Applications, Field Procedure for total station survey, Errors in Total Station Survey

Applications: Used for planning and design of transportation systems such as highways and railways.

UNIT – V
Global Positioning Systems - Segments, GPS measurements, errors and biases, Surveying with GPS, Co-ordinate transformation, accuracy considerations
Remote Sensing - Introduction - Electromagnetic Spectrum, interaction of electromagnetic radiation with the atmosphere and earth surface, remote sensing data acquisition - platforms and sensors; visual image interpretation; Introduction to digital image processing
Applications: To precisely mark the boundaries of properties such as in Cadastral Surveying

UNIT – VI
Photogrammetric Surveying - Introduction, Basic concepts, perspective geometry of aerial photograph, relief and tilt displacements, terrestrial photogrammetry, flight planning; Stereoscopy, ground control extension for photographic mapping- aerial triangulation, radial triangulation, methods
Applications: To mark the national and state boundaries, chart coastlines, navigable streams and lakes

TEXT BOOKS:

1. Surveying and Leveling by R. Subramanian, Second Edition Oxford University Press - 2012
2. Anji Reddy, M., Remote sensing and Geographical information system, B.S. Publications, 2001.

REFERENCES:

1. Surveying Theory and Practice Seventh edition by James M. and Anderson Edward M. Mikhail TATA McGraw Hill
2. Duggal S K, "Surveying (Vol – 1 & 2), Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2004.
3. Arthur R Benton and Philip J Taety, Elements of Plane Surveying, McGraw Hill – 2000
4. "Advanced Surveying Total Station GIS and Remote Sensing by SatheeshGopi, R. Sathi Kumar and N. Madhu.

1	2	3	4	5	6	7	8	9	10	11	12
H										M	

8K303: BUILDING MATERIALS AND PLANNING

B.Tech II Year I Sem.

L	T	P/D	C
2	-	-	2

Course Objectives:

To introduce the students to,

1. To study about the basic building materials, properties and their applications.
2. The manufacturing process of cement, its basic composition and its testing specifications.
3. The types of masonry, mortars and finishes provided in a building.
4. The types of timber, paints and the emerging building materials.
5. To understand the different types of arches, roofs and floors.
6. The principles of planning and construction bye-laws.

Course Outcomes:

At the end of the course, the student will be able to,

1. Identify the different materials and use them appropriately.
2. Test the various properties of cement and to use the appropriate admixtures.
3. Identify the various mortars and check for its suitability in various jobs.
4. To effectively use new building materials and appropriate paints for the various works undertaken.
5. Appropriately suggest the different roof and floor types for different construction practices.
6. Plan construction activities in adherence with the bye-laws.

UNIT- I:

Stones: Uses of stones as building materials. Characteristics of good building stones. Classification of stones. Quarrying -Various methods. Dressing and polishing of stones.

Bricks: Composition of brick clay. Methods of manufacturing bricks. Preparation of brick earth, Tempering, Pugmill. Various steps of moulding. Drying and method of burning of bricks-clamps. Intermittent and continuous kilns. Bull's trench kiln, Holfman's kiln. Characteristics of good building bricks. Classification of bricks

Building Blocks: Hollow building blocks for walls and roofing. Load bearing and non-load bearing blocks. Provisions of IS2572.Fly ash bricks and their manufacture.

UNIT- II:

Cement: Chemical composition of the ingredients for manufacturing cement. Outline of manufacturing process, flow diagram. Tests of cement.I.S.269 specifications for Ordinary Portland Cement.Various types of cements.

Blended Cements: Various types and their uses.

Fine aggregates: Characteristics of good mortar sand, availability of sand and its classifications. Alternatives to natural sand. Bulking of sand.

Coarse Aggregates: Characteristics of good coarse aggregates for manufacture of concrete. Tests on aggregate. Light weight aggregates.

UNIT - III

Mortar: Different types of mortars, preparation, setting and curing. Manufacturing methods of mortar.

Concrete: Batching, mixing, transporting, compacting and curing. Ready mix concrete.

Reinforced steel: Types of reinforcement, specifications, storage and handling.

Plastering, pointing and white/colour washing: Types of Plastering, preparation of surfaces and defects. Types of pointing, preparation of surfaces.

Forms work and scaffolding: Requirements, types, materials, accessories, reuses and maintenance.

UNIT - IV

Timber: Timber as a building material and its uses. Various types of timber. Seasoning and its importance. Preservation of wood. Laminates and their uses.

Paints, Varnish and Distemper: Constituents, characteristics of good paints. Bases, vehicles, thinners and colouring pigments. Painting of different types of surfaces; types of varnish, and application. Types of distemper and application.

Emerging Building Materials: Energy conservation in buildings. Recycled materials, local materials and industrial waste products as a means of sustainable development, Glass, FRPs, composites and smart materials, Aluminum composite paneling, Structural

Glazing , UPVC door frames.

UNIT - V

Lintels and Arches:

Definition, function and classification of lintels, balconies, chejja and canopy, Arches; Elements and Stability of an Arch.

Floors and roofs:

Floors: Requirements of good floor, Components of ground floor, Selection of flooring material, Laying of Concrete, Mosaic, Marble, Granite, Tile flooring, Cladding of tiles.

Roof: Requirement of good roof, Types of roof, Elements of a pitched roof, trussed roof, King post Truss, Queen Post Truss, Steel Truss, Different roofing materials, R.C.C.Roof.

UNIT - VI

Building Planning: Principles of Building Planning; General Building regulations and Bye laws for Residential Buildings; Climate and its influence on planning- Elements of climate: Solar radiation, Wind, Relative Humidity, Temperature, precipitation, topography.

TEXT BOOKS:

1. Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi.
2. Building Materials and Construction – Arora &Bindra, Dhanpat Roy Publications.

REFERENCE BOOKS:

1. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2015.
2. Building Materials by Duggal, New Age International.
3. Building Materials by P. C. Varghese, PHI.
4. Building Construction by PC Varghese PHI.
5. Construction Technology – Vol – I & II by R. Chubby, Longman UK.

Proposed Syllabus
Soft Skills

CSE, ECE, CIVIL: II/I
IT, MECH, ECM, EEE: II/II

Subject Code: 8HC03 **Lab Code:**
8HC63
L – T –P/D – C **L – T –P/D - C**
1 0 0 1 **0 0 2 1**

Maximum Marks: 100 (Internal – 30 / External – 70)

1	2	3	4	5	6	7	8	9	10	11	12
							X	X	X		X

Course objectives:

- To enable students to:
- make self-assessment.
- know the importance of certain soft skills like time management, goal setting and etiquette so that they can make their mark in their career and life in general.
- sharpen their verbal ability to handle the competitive exams.
- enhance their team skills and design thinking capabilities for effective problem solving and decision making.
- know their emotional information which guides their thinking, behavior and helps them manage stress efficiently.
- equip themselves with the prerequisites, and the relevant techniques to effectively tackle the corporate interview process in vogue.

UNIT:1

Know Yourself:

1.1 Importance of knowing yourself

1.2 SWOT / SWOC Analysis

1.3 SWOT / SWOC Grid

UNIT: 2

Soft Skills III:

2.1 Time management

2.2 Goal Setting

UNIT: 3

Verbal Aptitude:

3.1 Reading Comprehension:

Strategies to comprehend difficult passages from a book

3.2 Word Analogies

3.3 Spotting Errors

3.4 Sentence Completion / Sentence Equivalence

UNIT: 4

Skills to excel:

4.1 Team work and Team Dynamics - Collaboration and Leadership

4.2 Decision Making, Design Thinking, Critical thinking and Creative Problem Solving

4.3 Agile project/ Product life cycle management, Creativity and Innovation, Empathy, Customer centricity

UNIT: 5

Self-Management Skills:

5.1 Emotional Intelligence

5.2 Stress Management

UNIT: 6

Interview Skills:

6.1 Interview Skills: Meaning and Purpose of an Interview

6.2 Types of interviews; Interview Preparation techniques

6.3 Dress code at an interview

6.4 FAQs in HR Interview

Text Book: SOFT SKILLS – Dr. K. Alex, S. Chand publications

Suggested Readings:

- SOFT SKILLS – Meenakshi Raman ;
- Word Power made Easy – Norman Lewis
- Objective English - Pearson's Publications
- Skill Sutras- Jayashree Mohanraj
- The Power of Soft Skills – Robert A. Johnson
- Soft Skills for Everyone – Jeff Butterfield

1	2	3	4	5	6	7	8	9	10	11	12
		M		H							L

Python Programming and Computer Algorithms

Open Elective - I

Code: 8FC22

L	T	P/D	C
2	0	0	2

Course Objectives:-

After taking this course, you should be able to:

- Use Python interactively, execute a Python script at the shell prompt, use Python types, expressions, and None, use string literals and string type, use Python statements (if...elif..else, for, pass, continue, . . .), understand the difference between expressions and statements, understand assignment semantics, write and call a simple function., utilize high-level data types such as lists and dictionaries, understand the difference between mutable and immutable types, write a simple class and access methods and attributes, import and utilize a module, read from and write to a text file.
- Learn the basic concepts and the ability to understand and **design algorithms** using greedy strategy, divide and conquer approach and dynamic programming.

Course Outcomes:

CO1: Gains exposure towards Python versions and their specifications and build programs using primitive data types.
CO2: Write applications that include functions, modules, packages along with respective exceptional handling mechanism.
CO3: Writes applications using OO features of Python and applications using Files.
CO4: Hands on exposure on NumPy/Tkinter/Plotpy modules
CO5: Analyze worst-case running times of algorithms using asymptotic analysis. Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide and-conquer algorithms.
CO6: Describe the dynamic-programming paradigm and the greedy paradigm and explain when an algorithmic design situation calls for it. Synthesize dynamic programming and greedy algorithms and analyze them.

UNIT I: **Introduction to Python**:
History, Features, Modes of Execution, Setting up path, working with Python Basic Syntax, Variable and Data Types, Operators. Conditional Statements (If, If- else, Nested if-else) Looping (for, While Nested loops) Control Statements (Break, Continue, Pass).

- **Functions:** Defining a function, calling a function, Types of functions, Function Arguments

UNIT II: String Manipulation:

Accessing Strings, Basic Operations, String slices

- **Lists:** Accessing list, Operations, Tuple: Accessing tuples, Operations,
- **Dictionaries:** Accessing values in dictionaries,
- **Modules:** Importing module, Math module, Random module, Packages
- **Exception Handling**:Exception, Exception Handling, Except clause, Try? Finally clause User Defined Exceptions
-

UNIT III:

- **Python- OOPs concept:** Class and object, Attributes, Inheritance, Overloading Overriding, Data hiding.
- **Regular expressions:** Match function, Search function, Matching VS Searching, Modifiers Patterns.

UNIT IV:

Case Study with NumPy/PlotPy/SciPy/GUI Programming, Introduction, Tkinter programming, Tkinter widgets

UNIT V:

Introduction: Algorithm, Performance Analysis-Space complexity, Time complexity,

Asymptotic Notation- Big oh notation, Omega notation, Theta notations

- **Divide and conquer:** General method, applications-Binary search, Merge sort
- **Applications:** Implementing Algorithms ,performance analysis and sorting techniques using Python

UNIT VI:

- **Greedy method**: General method, applications- 0/1 knapsack problem, Minimum cost spanning trees.
- **Dynamic Programming**: General method, applications- Travelling sales person problem, Reliability design.
- **Applications:** Implementing some Greedy method and Dynamic programming techniques using Python

Text books:

1 Think Python: How to Think Like a Computer Scientist Allen B. Downey, O'Relly publications.
2. Learning with Python by Jeffrey Elkner, Chris Meyers Allen Downey, Dreamtech Press.
3. Fundamentals of Computer Algorithms, Ellis Horowitz,Satraj Sahni and Rajasekharam,Galgotia publications pvt. Ltd.

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Open Elective - I

8ZC02 – BASICS OF ENTREPRENEURSHIP (WADHWANI MODEL)

Course Objective: The objective of the course is to make students understand the nature of Entrepreneurship, and its importance to business to the engineering students, which will allow them to get the required intuition and interest in starting their own start-up's

Course Outcomes:

1. The students' will acquire basic knowledge on Skills of Entrepreneurship.
2. The students' will understand the techniques of selecting the customers through the process of customer segmentation and Targeting
3. Business Models and their validity are understood by the students'.
4. The basic cost structure, Revenue Streams and the pricing strategies are understood by the students'.
5. The students' will acquire knowledge about the project management and its techniques.
6. The students' get exposure on marketing strategies and business regulations for the Start up.

Unit – I: Introduction to Entrepreneurship & Self Discovery: - Define Entrepreneurship, Entrepreneurship as a Career option, Find your Flow, Stock of Your Means, Characteristics, Qualities and Skills of Entrepreneurship, Effectuation, Principles of Effectuation, Life as an Entrepreneur, Stories of Successful Entrepreneurs.

Unit – II: Opportunity & Customer Analysis: - Identify your Entrepreneurial Style, Methods of finding and understanding Customer Problems, Run Problem Interview, Process of Design Thinking, Identify Potential Problems worth Solving, Customer Segmentation, Niche Marketing and Targeting, Craft your Values Proportions, Customer-driven Innovation.

Unit – III: Business Model & Validation: - Introduction to Business Models, Lean approach to Business Model Canvas, Blue and Red Ocean Strategies, the Problem-Solution Fit, Build your Solution Demo, Solution Interview Method, Identify Minimum Viable Product (MVP), Product-Market fit test.

Unit – IV: Economics & Financial Analysis: - Revenue Analysis, Identify different Revenue Streams and Costs Analysis – Startup Cost, Fixed Cost and Variable Cost, Break

Even Analysis, Profit Analysis, Introduction to Pricing, different Pricing Strategies, Sources of Finance, Bootstrapping and Initial Financing, Practice pitching to Investors and Corporate.

Unit – V: Team Building & Project Management: - Leadership Styles, Shared Leadership Model, Team Building in Venture, Roles and Responsibilities of team in venture, Explore collaboration tools and techniques, Brainstorming, Introduction to Project Management, Project Life Cycle, Create a Project Plan.

Unit – VI: Marketing & Business Regulations: - Positioning, Positioning Strategies, Branding, Branding Strategies, Selecting and Measuring Channels , Customer Acquisition, Selling Process, Selling Skills, Sales Plans. Business regulations – List of Required Registrations, Compliance Check List, Business Structures and Legal Entities.

References:

- Robert D Hisrich, Michael P Peters, Dean A Shepherd, Entrepreneurship, Sixth Edition, New Delhi, 2006.
- Thomas W. Zimmerer, Norman M. Scarborough, Essentials of Entrepreneurship And Small Business Management, Fourth Edition, Pearson, New Delhi, 2006
- Alfred E. Osborne, Entrepreneur's Toolkit, Harvard Business Essentials, HBS Press, USA, 2005.
- MadhurimaLall, ShikhaSahai, Entrepreneurship, Excel Books, First Edition, New Delhi, 2006.
- S.S. Khanka, Entrepreneurial Development, S. Chand and Company Limited, New Delhi, 2007.
- H. Nandan, Fundamentals of Entrepreneurship, Prentice Hall of India, First Edition, New Delhi, 2007.
- S.R. Bhowmik, M. Bhowmik, Entrepreneurship-A tool for Economic Growth And A key to Business Success, New Age International Publishers, First Edition, (formerly Wiley Eastern Limited), New Delhi, 2007.
- *https://www.wfglobal.org/*
- *https://www.learnwise.org/#/IN/en/home/login*,

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Open Elective - I

8ZC11 BANKING OPERATIONS, INSURANCE AND RISK MANAGEMENT

Course Objectives: To make the students understand the concepts and principles of Indian Banking Business, Insurance Business and Capital market business products and services, which facilitate them to understand the nature of market.

Course Outcomes:

1. Describe the new dimensions and products served by the banking system in INDIA.
2. Explain the credit control system and create awareness on NPA's
3. Apply the knowledge of Insurance concepts in real life scenarios
4. Recognize the importance of regulatory and legal frame work of IRDA
5. Identify the risk management process and methods.
6. Calculate the diversity of risk and return

UNIT I

INTRODUCTION TO BANKING BUSINESS: Introduction to financial services - History of banking business in India, Structure of Indian banking system: Types of accounts, advances and deposits in a bank. KYC norms, New Dimensions and products- E-Banking: Mobile-Banking, Net Banking, Digital Banking, Negotiable Instruments: Cheque system.

UNIT II

BANKING SYSTEMS AND ITS REGULATION: Banking Systems: Branch Banking, Unit Banking, Correspondent Banking, Group Banking, Deposit Banking, Mixed Banking and Investment Banking - Banking Sector Reforms with special reference to Prudential Norms, Capital Adequacy Norms, Classification of Assets and NPA's, Functions of RBI, Role of RBI in regulating Indian Banking. Banking Ombudsman scheme.

UNIT III

INTRODUCTION TO INSURANCE: Introduction to insurance, Need and importance of Insurance, principles of Insurance, characteristics of insurance contract, branches of insurance and types of insurance: Life insurance and its products, General Insurance and its variants.

UNIT IV

INSURANCE BUSINESS ENVIRONMENT: Procedure for issuing an insurance policy – Nomination - Surrender Value - Policy Loans – Assignment - Revivals and Claim Settlement; Insurance as a tax mitigation tool, Role of IRDA in Insurance Regulation.

UNIT V

FINANCIAL MARKETS AND RISK MANAGEMENT: Introduction to Financial Markets: Money Market – Capital market; Introduction to Risk Management, meaning and classification of risks, Risk management process, Risk Management Approaches and Techniques.

UNIT VI

DERIVATIVES AS A RISK MANAGEMENT TOOL: Introduction to Financial Derivatives, Advantages of Derivatives - types of Derivative Contracts - Forwards, Futures, Options and Swaps - Differences among Forwards, Futures and Option Contracts.

References:

- Varshney, P.N., Banking Law and Practice, Sultan Chand & Sons, New Delhi.
- General Principles of Insurance Harding and Evantly
- Mark S. Dorfman: Risk Management and Insurance, Pearson, 2009.
- Scott E. Harringam Gregory R. Nichanus: Risk Management & Insurance, TMH, 2009.
- Geroge E. Rejda: Principles of risk Management & Insurance, 9/e, pearson Education. 2009.
- G. Koteshwar: Risk Management Insurance and Derivatives, Himalaya, 2008.

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Open Elective - I

8ZC08 DESIGN LITERACY AND DESIGN THINKING

Course Objective: The objective of the course is to make students understand the fundamental concepts of design thinking, and to familiarize with product design process and to motivate the students to ideate new products and services.

Course Outcomes:

1. The students gain the knowledge on the inputs required for design thinking and also gain familiarity on concepts related to design thinking.
2. The students learn the techniques of idea generation
3. The students gain knowledge on different phases of design thinking
4. The students realize the product design process.
5. The students gain familiarity on design thinking for service design.
6. The students gain knowledge on variouscases related to design thinking.

Unit – I: Design Thinking – Introduction to Design thinking, Principles of design thinking, Benefits of design thinking, Applications of Design thinking, Social Innovation, Impact of Design thinking, Design thinking tools and techniques. Innovation and Design thinking.

Unit – II: Idea Generation: New Idea generation methods - Principles of Idea Generation, Techniques, Creativity thinking techniques and tools, types of creative thinking, select ideas from ideation methods.

Unit – III: Design Thinking Foundations: The Design Double Diamond: Discover-Define-Develop-Deliver, User-centric design approaches: Importance of user-centricity for design, Empathisation, Empathy Maps, Data collection from users and for users, Data Validation Responsible Innovation and Ethical Design:

Unit – IV: Product Design Process: Identification of opportunities, Problem Statement, Product planning, Characteristics of Successful product Development, New product development process, Stanford design thinking iterative model

Unit – V:Design Thinking for Service Design: Attributes of a good service design, service design tools – blueprint, customer journey mapping Identifying the user needs in a service-driven economy; Process Flows and Customer Experience considerations for designing and improving services; 5 Why"s; Service Delivery Pathways

Unit – VI: Case Studies on Design thinking: Case 1: Arcturus IV by John E.Arnold, Case – 2: How can we make AI to make things better for humans. Case – 3: User Centered Helmet Design by Prof. B.K. Chakravarthy- Part 1 and Part 2; Case – 4: Challenges of Reaching a Million Users by Prof. Chetan Solanki and Prof Jayendran V.

Text Books:

1. Brown, T. (2008). Design thinking. *Harvard business review*, *86*(6), 84.
2. "Innovation by Design", Gerald H. (Gus) Gaynor, AMACOM {American Management Association), NYC, 2002
3. Ansell, C., &Torfing, J. (2014). Collaboration and design: new tools for public innovation. In *Public innovation through collaboration and design* (pp. 19-36). Routledge.
4. Lewrick, M., & Link, P. (2015). Design thinking tools: Early insights accelerate marketers'success. *Marketing Review St. Gallen*, *32*(1), 40-51.

References Books:

1. Mæhlum, A. R. (2017). *Extending the TILES Toolkit-from Ideation to Prototyping* (Master's thesis, NTNU).
2. Norman, D. (2013). *The design of everyday things: Revised and expanded edition*. Basic books.
3. Design Thinking – A primer,Prof: Dr. BalaRamadurai, Indian Institute of Technology, Madras.

Websites:

1. **www.smashingmagazine .com**

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8HC018 - UNIVERSAL HUMAN VALUES

Course code:

II B. Tech I Sem (for CSE, ECE and CE)

II B. Tech II Sem (for EEE, ME, IT and ECM

L	T	P	C
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Human Values Courses: This course also discusses their role in their family. It, very briefly, touches issues related to their role in the society and the nature, which needs to be discussed at length in one more semester for which the foundation course named as "H-102 Universal Human Values 2: Understanding Harmony"is designed which may be covered in their III or IV semester. During the Induction Program, students would get an initial exposure to human values through Universal Human Values – I. This exposure is to be augmented by this compulsory full semester foundation course.

OBJECTIVE: The objective of the course is four fold:

1. Development of a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
2. Understanding (or developing clarity) of the harmony in the human being, family, society and nature/existence
3. Strengthening of self-reflection.
4. Development of commitment and courage to act.

COURSE TOPICS: The course has 28 lectures and 14 practice sessions in 5 modules:

Module 1: Course Introduction - Need, Basic Guidelines, Content and Process for Value Education

1. Purpose and motivation for the course, recapitulation from Universal Human Values-I
2. Self-Exploration–what is it? - Its content and process; 'Natural Acceptance' and Experiential Validation- as the process for self-exploration
3. Continuous Happiness and Prosperity- A look at basic Human Aspirations
4. Right understanding, Relationship and Physical Facility- the basic requirements for fulfillment of aspirations of every human being with their correct priority
5. Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
6. Method to fulfill the above human aspirations: understanding and living in harmony at various levels.

Include practice sessions to discuss natural acceptance in human being as the innate acceptance for living with responsibility (living in relationship, harmony and co-existence) rather than as arbitrariness in choice based on liking-disliking.

Module 2: Understanding Harmony in the Human Being - Harmony in Myself!

7. Understanding human being as a co-existence of the sentient 'I' and the material 'Body'

8. Understanding the needs of Self ('I') and 'Body' - happiness and physical facility

9. Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)

10. Understanding the characteristics and activities of 'I' and harmony in 'I'

11. Understanding the harmony of I with the Body: Sanyam and Health; correct appraisal of Physical needs, meaning of Prosperity in detail

12. Programs to ensureSanyam and Health. Include practice sessions to discuss the role others have played in making material goods available to me. Identifying from one's own life. Differentiate between prosperity and accumulation. Discuss program for ensuring health vs dealing with disease.

Module 3: Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship

13. Understanding values in human-human relationship; meaning of Justice (nine universal values in relationships) and program for its fulfillment to ensure mutual happiness; Trust and Respect as the foundational values of relationship

14. Understanding the meaning of Trust; Difference between intention and competence

15. Understanding the meaning of Respect, Difference between respect and differentiation; the other salient values in relationship

16. Understanding the harmony in the society (society being an extension of family): Resolution, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals

17. Visualizing a universal harmonious order in society- Undivided Society, Universal Order- from family to world family.

Include practice sessions to reflect on relationships in family, hostel and institute as extended family, real life examples, teacher-student relationship, goal of education etc. Gratitude as a universal value in relationships. Discuss with scenarios. Elicit examples from students' lives.

Module 4: Understanding Harmony in the Nature and Existence - Whole existence as Coexistence

18. Understanding the harmony in the Nature
19. Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self-regulation in nature
20. Understanding Existence as Co-existence of mutually interacting units in all-pervasive space
21. Holistic perception of harmony at all levels of existence.

Include practice sessions to discuss human being as cause of imbalance in nature (film "Home" can be used), pollution, depletion of resources and role of technology etc.

Module 5: Implications of the above Holistic Understanding

22. Natural acceptance of human values
23. Definitiveness of Ethical Human Conduct
24. Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order

Module 6:Harmony on Professional Ethics

25. Competence in professional ethics:

a. Ability to utilize the professional competence for augmenting universal human order

b. Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems,

c. Ability to identify and develop appropriate technologies and management patterns for above production systems.

26. Case studies of typical holistic technologies, management models and production systems
27. Strategy for transition from the present state to Universal Human Order:

a. At the level of individual: as socially and ecologically responsible engineers, technologists and managers

b. At the level of society: as mutually enriching institutions and organizations

28. Sum up.

Include practice Exercises and Case Studies will be taken up in Practice (tutorial) Sessions eg. to discuss the conduct as an engineer or scientist etc.

3. READINGS:

3.1 Text Book

a) Human Values and Professional Ethics by R R Gaur, R Sangal, G P Bagaria, Excel Books, New Delhi, 2010 3.

b) Reference Books

1. Jeevan Vidya: Ek Parichaya, A Nagaraj, Jeevan Vidya Prakashan, Amarkantak, 1999.
2. Human Values, A.N. Tripathi, New Age Intl. Publishers, New Delhi, 2004. 3.The Story of Stuff (Book).
4. The Story of My Experiments with Truth - by Mohandas Karamchand Gandhi
5. Small is Beautiful - E. F Schumacher.
6. Slow is Beautiful - Cecile Andrews
7. Economy of Permanence - J C Kumarappa
8. Bharat Mein Angreji Raj - PanditSunderlal
9. Rediscovering India - by Dharampal
10. Hind Swaraj or Indian Home Rule - by Mohandas K. Gandhi
11. India Wins Freedom - Maulana Abdul Kalam Azad
12. Vivekananda - Romain Rolland (English)
13. Gandhi - Romain Rolland (English)

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8K371: MECHANICS OF SOLIDS LABORATORY

B.Tech II Year I Sem.

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

Course Outcomes: At the end of the course, the student will be able to:
1. Conduct tension test on Materials like steel etc.
2. Conduct compression tests on spring, wood and concrete
3. Conduct flexural and torsion test to determine elastic constants
4. Determine hardness of metals

List of Experiments:
1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.

List of Major Equipment:
1. UTM for conducting tension test on rods
2. Steel beam for flexure test
3. Wooden beam for flexure test
4. Torsion testing machine
5. Brinnell's / Rock well's hardness testing machine
6. Spring testing machine
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine
10. Beam setup for Maxwell's theorem verification.
11. Continuous beam setup
12. Electrical Resistance gauges.

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8K372: SURVEYING LABORATORY

B.Tech II Year I Sem.

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Course Objectives:

The student is being exposed to the course with the following purpose.

1. Gain hands on experience with the working principles of various instruments such as Total Station.
2. Be able to set out any Civil Engineering work in the field.
3. Learn about the various automation processes being used in surveying works

Course Outcomes:

At the end of the course, the student is expected to have learnt the following.

1. Stake out/Lay out different types of curves in the field.
2. Use modern instruments such as Total Station and GPS for locating and plotting any/all ground features.
3. Develop contour maps for vast swathes of lands at ease and with minimum supervision

List of Experiments

1. To determine the distance between two points using Direct Ranging
2. Calculate the area of a given piece of land/tract using compass surveying (Traversing or Radiation method)
3. To determine the Reduced Levels of different points using principle of leveling
4. Introduction to Theodolite / Using a Theodolite, Measuring the Horizontal angle between two given points using Repetition method
5. Using a Theodolite, Measuring the Horizontal angle between given points using Reiteration method and calculating the area of given tract of land
6. Plotting a Simple Curve using Angular Method – Rankines Method
7. Introduction to Total Station / Determination of area of a given tract of land using Total Station
8. Contouring using Total Station
9. Determining the Remote Height using Total Station
10. Setting out a Curve Setting using Total Station
11. Calculating the Distance, gradient, differential height between two inaccessible points using Total Station
12. With the help of Total Station, Stake out / Setting layouts for Buildings, Pipelines, etc

Miscellaneous Experiments (Demonstration Only)

1. Plotting a Simple Curve using Linear Method – Offsets from Long Chord
2. Resection using Total Station
3. Traversing using Total Station
4. Introduction to GPS – locating ground Features

Textbooks

1. Surveying and Levelling by NN Basak, McGraw Hill – 2014

2. Laboratory Manual

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8K373: COMPUTER AIDED DRAFTING OF BUILDINGS LABORATORY

B.Tech II Year I Sem.

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Course Objectives:

The objective of this lab is to teach the student basic drawing fundamentals in various civil engineering applications, especially in building drawing, 3d modeling of building, interior designing etc using Auto CAD, Sketch up and 3ds Max.

Course Outcomes:

At the end of the course, the student will be able to:

1. Master the usage of AutoCAD commands for drawing 2D & 3D building drawings
2. Able to create plans and sections for buildings

List of Experiments

1. Introduction to Computer Aided Drafting – CAD software.
2. Practice exercises on CAD software.
3. Drafting Plan for a Single storied building using AutoCAD
4. Drafting Plan for a Multi storied building using AutoCAD
5. Developing sections and elevations for a Single storied building.
6. Developing sections and elevations for a Multi storied building.
7. Detailing of building components – Doors, Windows.
8. Stairs and Staircases – Drawing Section and Plan.
9. Sketching of Roof Trusses.
10. Exercise on development of working drawings of a building.
11. 3D modelling of a single storied building in Auto CAD.
12. 3D modelling of a Multi storied building in Auto CAD (Lab project).

TEXT BOOKS:

1. Computer Aided Design Laboratory by M. N. SeshaPraksh&Dr. G. S. Servesh – Laxmi Publications.
2. Engineering Graphics by P. J. Sha – S. Chand & Co.

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H: High M: Medium L: Low

Syllabus for B. Tech II Year I Semester
Civil Engineering
TECHNICAL SEMINAR –III

Code: 8K391	**L**	**T**	**P**	**C**
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Course Objective :

1. Develop ability to be a public speaker with the aid of Power Point Presentations.
2. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts.
3. Practice and develop communication skills and interview performance skills.

Course Outcomes:

1. Demonstrate public speaking with the aid of Power Point Presentations
2. Identify current general and specific technological topics of interest and prepare and present the content cogently.
3. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Content	: 20 marks
Presentation including PPT	: 20 marks
Seminar Notes	: 10 marks
Interaction	: 10 marks
Report	: 25 marks
Attendance	: 10 marks
Punctuality	: 5 marks
Total	**100 marks**

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H: High M: Medium L: Low

ECONOMICS, ACCOUNTACY, AND MANAGEMENT SCIENCE (EAMS)

B. Tech II Yr II Semester

L	T	P	C
2	-	-	2

Code: 8ZC01

Course Objectives:

- To understand the basics of Managerial Economics at Micro level, Demand analysis and production analysis in particular.
- To understand cost concept, Revenues and Market structure
- To understand and identify various basic concepts of Accounting, Double entry system and Book keeping.
- To understand the concepts of Capital expenditure, Revenue expenditure and Final accounts.
- To make student understand the basics of Management, its principles and various functions performed in organization.
- To make student learn about various personality traits, perception, attitudes of individuals working in organization.

UNIT-1

INTRODUCTION TO MANAGERIAL ECONOMICS:

Definition, Nature and scope of Managerial Economics, consumer's Equilibrium. Theory of Demand, Demand function, Determinants, exceptions - Price Elasticity of Demand and Demand forecasting. Theory of supply, Production function and Economies of scale.

UNIT- 2

INTRODUCTION TO COST, REVENUE AND MARKET STRUCTURE:

Cost Analysis, types of costs, Revenue Analysis, Break-even Analysis (BEA)- Determination of Break-Even Point (simple problems). Market structures: Types of competition, Features of Perfect competition, Monopoly, Monopolistic Competition and oligopolistic competition.

UNIT-3

INTRODUCTIONT O FINANCIAL ACCOUNTING:

Meaning and Definition of Accounting, principles of Accounting, Double-Entry system of Accounting, Book Keeping, introduction to Journal, Ledger and its types, Introduction to Trial balance, problems and solutions of trial balance.

UNIT-4

INTRODUCTION TO FINAL ACCOUNTS:

Introduction to Final Accounts, Concepts of classifications of Revenue and Capital expenditures, Final accounts: Trading account, Profit and Loss Account, Balance sheet, Problems and solutions of Final accounts with adjustments.

UNIT-5

INTRODUCTION TO MANAGEMENT:

Management- Definitions, Fayol's principles of Management, Levels of Management, functions of management. Planning: types of planning, planning process; Organizing: Organizational Design and structure, staffing; Directing;, Controlling: Basic control process.

UNIT-6

INTRODUCTION TO ORGANIZATIONAL BEHAVIOR: Definition, Nature and Scope, Perception – Perceptual selectivity and organization, Personality and Attitudes, Determinants of personality Formation of Attitudes-**,** Perceptual Distortions Attribution analysis Attribution theories, Johari Window and Transactional Analysis.

Essential Readings:

1. A R Aryasri: Managerial Economics, Tata Mc Graw Hill
2. A R Aryasri: Management Science, Tata Mc Graw Hill

Suggested Readings:

1. S A Siddiqui & A S Siddiqui, Managerial Economics & Financial Analysis, New Age
2. Accountancy – I Tulasian Tata Mcgraw Hill Co
3. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2005

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8K404: Mechanics of Materials

B.Tech II Year II Sem. **L T P C**
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Course Objectives:

- Understand the deformation and strains under different load action and response in terms of forces and moments.
- Understand the behavior under different loading actions.
- Comprehend the deformation of structures under load actions.
- Understand the force-stress equilibrium relationship in Multiaxial load condition.
- Understand the displacement-strain relationship in Multiaxial load condition.
- Understand the stress behavior in the thin cylinders and sphere.

Course Outcomes:

- Able to evaluate the deformation of structures.
- Describe the stability of structures under certain loading conditions.
- To assess the deformation for structures under load actions.
- To evaluate the force-stress equilibrium relationship in Multiaxialload condition.
- To evaluate the displacement-strain relationship in Multiaxial load condition.
- To solve the stress behavior pattern in thin cylinder and sphere.

UNIT I:
Deformation and Strain covering description of finite deformation, Infinitesimal deformation; Analysis of statically determinate trusses; Stress analysis of thin, thick and compound cylinder;

UNIT II:
Generalized state of stress and strain: Stress and strain tensor, Yield criteria and theories of failure; Tresca, Von-Mises, Hill criteria, Heigh-Westerguard's stress space.

UNIT III:
Momentum Balance and Stresses covering Forces and Moments Transmitted by Slender Members, Shear Force and Bending Moment Diagrams, Momentum Balance, Stress States / Failure Criterion.

UNIT IV:
Mechanics of Deformable Bodies covering Force-deformation Relationships and Static Indeterminacy, Uniaxial Loading and Material Properties, Trusses and Their Deformations, Statically Determinate and Indeterminate Trusses.

UNIT V:
Bending: Stress and Strains; Deflections and Torsion covering Pure Bending, Moment-curvature Relationship, Beam Deflection, Symmetry, Superposition, and Statically Indeterminate Beams, Shear and Torsion, Torsion and Twisting, General energy theorems, Castigliano's theorem, Maxwell Bettie's reciprocal theorem; Virtual work and unit load method for deflection, Application to problems of beams and frames.

UNIT VI:
Structural stability; Stability of columns, Euler's formula, end conditions and effective length factor, Columns with eccentric and lateral load; Plasticity and Yield Design covering 1D-Plasticity – An Energy Approach, Plasticity Models, Limit Analysis and Yield Design

Text Books:
1. Timoshenko, S. and Young, D. H., "Elements of Strength of Materials", DVNC, New York, USA.
2. Hibbeler, R. C. Mechanics of Materials. 6th ed. East Rutherford, NJ: Pearson Prentice Hall, 2004

Reference Books:
1. Crandall, S. H., N. C. Dahl, and T. J. Lardner. An Introduction to the Mechanics of Solids. 2nd ed. New York, NY: McGraw Hill, 1979

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8K405: Fluid Mechanics

B.Tech II Year II Sem.

L	T	P/D	C
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Course Objectives:

1. Understand fluid properties of Newtonian fluids.
2. Study analytical solutions to a variety of simplified problems.
3. Understand the dynamics of fluid flows and the governing equations.
4. Apply concepts of mass, momentum and energy conservation to flows.
5. Grasp the basic ideas of turbulence and energy loss in fluid flows.
6. Study the influence of boundaries of a body under fluid flow.

Course Outcomes:

1. Apply conservation laws to derive governing equations of fluid flows.
2. Compute hydrostatic and hydrodynamic forces.
3. Analyze and design simple pipe systems.
4. Apply principles of dimensional analysis to design experiments.
5. Compute drag and lift coefficients.
6. Applying boundary influences on a body moving within fluid

UNIT-I:

Fluid Properties: Basic Concepts and Definitions – Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; variation of viscosity with temperature, Newton law of viscosity; vapour pressure, boiling point, cavitation; surface tension, capillarity, Bulk modulus of elasticity, compressibility.

UNIT-II:

Fluid Statics - Fluid Pressure: Pressure at a point, Pascals law, hydrostatic law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micromanometers. pressure gauges, Hydrostatic force on submerged horizontal, vertical, and inclined surfaces. Buoyancy and stability of floating bodies.

UNIT – III:

Fluid Kinematics: Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows : Steady, unsteady, uniform, non uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows– stream and velocity potential functions, circulation and vortices, flow net analysis.

UNIT – IV:

Fluid Dynamics: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, Navier – Stokes equations (Explanatory), Momentum equation and its application – forces on pipe bend.

Pitot tube, Venturi meter, and orifice meter – classification of orifices, flow over rectangular, Triangular and trapezoidal and stepped notches - Broad crested weirs.

Dimensional Analysis and Dynamic Similitude - Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number; Buckingham's π-Theorem.(Added)

UNIT – V:

Closed Conduit Flow: Reynolds's experiment – Characteristics of Laminar & Turbulent flows. Laws of Fluid friction – Darcy's equation, variation of friction factor with Reynolds's number – Moody's Chart, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line. Pipe network problems Flow between parallel plates, Flow through long tubes, flow through inclined tubes, water hammer (no derivations).

UNIT – VI:

Boundary Layer Theory: Approximate Solutions of Navier Stokes Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Von-karmen momentum integral equation, laminar and turbulent Boundary layers (no derivations) BL in transition, separation of BL, control of BL, flow around submerged objects-Drag and Lift- Magnus effect .

TEXT BOOKS:

1. Fluid Mechanics by RC Hibbeler, SI Units ISBN 978-93-325-4701-8, Pearson Publications.
2. Bansal. R. K, "Fluid Mechanics and Hydraulics Machines", 5th edition, Laxmi publications (P) Ltd., New Delhi, Ninth Edition, 2006.

REFERENCE BOOKS:

1. Fluid Mechanics and Machinery by CSP. Ojha, R Berndtsson, PN. Chandramouli, Oxford University Press.
2. Fluid Mechanics 8th Edition in SI units By Frank M White, McGraw-Hill, ISBN 978-93-85965-49-4.
3. Fluid Mechanics and Machinery ByMohd. Kaleem Khan, Oxford University Press, ISBN 978-0-19-945677-2.
4. Fluid Mechanics by PiyushKundu.
5. Rajput.R.K, "A text book of Fluid Mechanics and Hydraulic Machines", S. Chand & Company Ltd., New Delhi, Fourth edition, 2010.

8K406: Hydrology and Water Resources Engineering

B. Tech II Year II Sem.

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Course objectives:
To enable the students,
1. Get comprehensive knowledge about occurrence, quantification of precipitaion;
2. understand abstractions of precipitation;
3. understand runoff calculation
4. know about various water withdrawals and uses;
5. understand different water distribution systems;
6. study various types of dams and spillways.

Course outcomes:
At the End of the course the student will be able to,
1. quantify precipitation;
2. estimate various abstractions of precipitation;
3. estimate runoffs from given data;
4. grasp and apply the knowledge of various water withdrawals and uses to practical problems;
5. able to apply design basic water distribution systems;
6. able to arrive at hydrologic design of spillways.

Unit I: Introduction
Hydrologic cycle, water-budget equation, history of hydrology, world water balance, applications in engineering, sources of data. Precipitation - forms of precipitation, characteristics of precipitation in India, measurement of precipitation, rain gauge network, mean precipitation over an area, depth area-duration relationships, maximum intensity/depth-duration-frequency relationship, Probable Maximum Precipitation (PMP), rainfall data in India.

Unit II: Abstractions from precipitation
Evaporation process, evaporimeters, analytical methods of evaporation estimation, reservoir evaporation and methods for its reduction, evapotranspiration, measurement of evapotranspiration, evapotranspiration equations, potential evapotranspiration over India, actual evapotranspiration, interception, depression storage, infiltration, infiltration capacity, measurement of infiltration, modelling infiltration capacity, classification of infiltration capacities, infiltration indices.

Unit III: Runoff
Runoff volume, SCS-CN method of estimating runoff volume, flowduration curve, flow-mass curve, hydrograph, factors affecting runoff hydrograph, components of hydrograph, base flow separation, effective rainfall, unit hydrograph surface water resources of India, environmental flows.

Unit IV: Water withdrawals and Uses

Water for energy production, water for agriculture, water for hydroelectric generation; flood control. Analysis of surface water supply, Water requirement of crops-Crops and crop seasons in India, cropping pattern, duty and delta; Quality of irrigation water; Soil-water relationships, root zone soil water, infiltration, consumptive use, irrigation requirement, frequency of irrigation; Methods of applying water to the fields: surface, sub-surface, sprinkler and trickle / drip irrigation.

Unit V: Distribution systems

Canal systems, alignment of canals, canal losses, estimation of design discharge. Design of channels- rigid boundary channels, alluvial channels, Kennedy's and Lacey's theory of regime channels. Canal outlets: non-modular, semi-modular and modular outlets. Water logging: causes, effects and remedial measures. Lining of canals, types of lining, drainage of irrigated lands: necessity, methods.

Unit VI: Dams and Spillways

Embankment dams: Classification, design considerations, estimation and control of seepage, slope protection. Gravity dams: forces on gravity dams, causes of failure, stress analysis, elementary and practical profile. Arch and buttress dams.

Spillways: components of spillways, types of gates for spillway crests; Reservoirs- Types, capacity of reservoirs, yield of reservoir, reservoir regulation, sedimentation, economic height of dam, selection of suitable site.

Text/Reference Books:

1. K Subramanya, Engineering Hydrology, Mc-Graw Hill.
2. K N Muthreja, Applied Hydrology, Tata Mc-Graw Hill.
3. K Subramanya, Water Resources Engineering through Objective Questions, Tata McGraw Hill.
4. G L Asawa, Irrigation Engineering, Wiley Eastern
5. L W Mays, Water Resources Engineering, Wiley.
6. J D Zimmerman, Irrigation, John Wiley & Sons
7. C S P Ojha, R Berndtsson and P Bhunya, Engineering Hydrology, Oxford.

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8K407: ENGINEERING GEOLOGY

B.Tech II Year II Sem.

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Course Objectives

Student shall be able,

1. To definebasic geological concepts from civil engineering point of view
2. To identifythe various physical properties of minerals and rocks
3. To understand the concept of structural geology
4. To understandthe significance of Geology as applied to Civil Engineering
5. To applythis knowledge in Civil Engineering projects such as dams, roads, tunnels and slopes
6. To acquire proper knowledge about natural geological hazards

Course Outcomes

After the completion of the course student should be able to,

1. Describe different concepts and terms used in Engineering Geology
2. Identify and explain various types of minerals and rocks
3. Apply the various concepts of Engineering Geology to civil engineering field
4. Examine and select the sites related to dams, roads, tunnels and slopes
5. Identify the hazards prior and able to take the necessary precautions
6. Knowledgeable about geological hazards

UNIT – I

Introduction

Definition of Geology, Engineering Geology. Importance of geology from Civil Engineering point of view. Importance of physical geology, petrology and structural geology. Case studies of failures of few civil engineering constructions, weathering of rocks and its effect on the properties of rocks, importance of weathering with reference to dams, reservoirs and tunnels. Earth structure- Lithosphere- Internal structure of the earthquake, Plate Tectonics.

Applications: For selection of sites and design for major structures such as dams, reservoirs, bridges, deep foundations for high-rise buildings, etc.

UNIT – II

Mineralogy

Definition of mineral, mineralogy, Importance of study of minerals: rock forming and ore forming minerals. Different methods of study of minerals.Study of minerals by physical identification method and their physical properties. Determination of Physical properties of following minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of ore forming minerals such as Pyrite, Hematite, Magnetite, Amethyst, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite, Coral reefs.

Applications: To Identify the various minerals useful in design of foundations

UNIT – III

Petrology

Definition of a rock, petrology. Classification of rocks-Geological classification of rocks. Rock Cycle. Classification of igneous Forms, structures and textures of igneous rocks. Classification of sedimentary rocks, and its structures and textures. Classification of metamorphic rocks, its structures and textures.

Megascopic Study of Granite, Dolerite, Basalt, Pegmatite, Charnockite, Sandstone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

Applications: To Identify various rocks useful for design of foundations.

UNIT – IV

Structural Geology

Out Crop, Study of geological structures associated with rocks such as folds, faults, joints, unconformities-their important types. Significance of Strike and dip in geological structures, shield areas and seismic belts, seismic waves, Richter scale, Precautions to be taken for building construction in seismic areas, Ground Water, water table, common types of ground water, springs, geological controls of ground water movement, ground water exploration.

Applications: In selection of site for major structures such as dam, reservoir, bridges, and high-rise buildings

UNIT – V

Importance of Geophysical investigations, Principles of geophysical methods. Importance of Electrical resistivity method and seismic refraction method from civil engineering point of view.

Geology of Dams, Reservoirs, Tunnels

Types of Dams, Importance of geological considerations in the site selection of dams, reservoirs and tunnels. Case histories of dams, geological factors affecting the water tightness and life of a reservoir. Purpose of tunneling, types of tunnels, over break, lining of tunnels.

Applications: Site selection for dams, life of reservoirs, planning of tunnels

UNIT-VI

Geological Hazards: Geographical aspects of earthquake, tsunamis and landslides. Disaster prevention mitigation and management.

Applications: Taking necessary measures when the disasters occur

TEXT BOOKS:

1. Engineering Geology By N. Chennakesavulu, McMillan India Ltd.
2. Engineering Geology by S K Duggal, H K Pandey McGraw Hill Education Pvt Ltd 2014.

REFERENCES:

1. Geology for Engineers and Environmental Scientists, Pearson.
2. Krynine& Judd, Principles of Engineering Geology &Geotechnics, CBS Publishers & Distribution.

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8HC05 - ENVIRONMENTAL SCIENCE AND ECOLOGY

II B. Tech I Sem (for EEE, ME, IT and ECM)
II B. Tech II Sem (for CSE, ECE and CE)
(Mandatory course)

There are no credits but grading will be given based on marks scored as **Outstanding/ Excellent/ Very good/ Good/ Above average/ Average/ Satisfactory/Not satisfactory**

Course Objectives:

1. To understand structure and function of ecosystem
2. To learn classification and uses of natural resources
3. To learn about Understanding the impacts of developmental activities and mitigation measures.
4. To know the source, causes and preventive methods of pollution
5. To understand the importance of ecological balance for sustainable development.
6. To understand the environmental policies and regulations

UNIT-I Ecosystems: Definition, Scope, and Importance of ecosystem. Classification, structure, and function of an ecosystem, Food chains, food webs, and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity.

UNIT-II Natural Resources: Classification of Resources: Living and Non-Living resources, water resources: use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources, Land Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternate energy source.

UNIT-III Biodiversity and Biotic Resources: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT-IV Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, Air Pollution: Primary and secondary pollutants. Acid rain-Threshold limit values of chemicals present in environment, Global warming, Ozone layer depletion, Water pollution: Sources and types of pollution. Soil Pollution: Sources and types, Impacts of modern agriculture, degradation of soil. Noise Pollution: Sources and Health hazards, standards, Solid waste: Municipal Solid Waste management, composition and characteristics of e-Waste and its management. Pollution control technologies: Sewage water Treatment, Kyoto protocol, and Montréal Protocol.

UNIT-V Sustainable development and Green Technology: Concept of sustainable development, threats to sustainability population and its explosion, Crazy consumerism, over-exploitation of resources, strategies for achieving sustainable development environmental education, conservation of resources, urban sprawl sustainable cities and sustainable communities, human health , role of IT in Environment, Environmental Ethics, Environmental Economic – Concept of Green Building, Clean Development Mechanism (CDM).

UNIT-VI Environmental Policy, Legislation & Environment Impact Assessment: Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules. EIA: EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP).

Course Outcomes

After completion of the course, the student will be able to:

1. Understand about ecosystem and energy flow among the organisms.
2. Know the resources available, use of them and overexploitation of the resources in the nature.
3. Learn the value, use and value of biodiversity.
4. Understand the causes and effect of pollution and implement measures in control of pollution.
5. Understand the sustainable development and implement green technology for sustainable development.
6. Learn and implement policy to protect the environment.

TEXT BOOKS:

1. Perspectives in Environmental Studies: Kaushik A. and Kaushik, C.P. New Age International (P) Ltd. (2008)

REFERENCE BOOKS:

1. Environmental Studies by Erach Bharucha, 2005 University Press.
2. Environmental Science: towards a sustainable future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
3. Environmental Engineering and science by Gilbert M. Masters and Wendell P. Ela. 2008 PHI Learning Pvt. Ltd.
4. Environmental Science by Daniel B. Botkin & Edward A. Keller, Wiley INDIA edition.
5. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
6. Text book of Environmental Science and Technology - Dr. M. Anji Reddy 2007, BS Publications.

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8EC42- PROGRAMMING IN JAVA

Open Elective - II

Course Objective:

Understand the concepts of Object oriented programming principles of Java. Write the programs and execute using OOP principles such as garbage collection, overloading methods, constructors, recursion, string handling, StringTokenizer, inheritance and its types, packages, multithreading and threads.

Course Outcomes :

1. Understand the concept of OOP with the need of constructing objects, and classes. Write programs using classes, objects, members of a class and the relationships among them needed for a specific problem.
2. Identify the purpose and usage of principles of inheritance and polymorphism. Implement concepts of polymorphism, encapsulation and method overloading
3. Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifiers, automatic documentation through comments)
4. Students understand and implement error exception handling and multi-threading.
5. Students learn to create GUI for the specific applications.
6. Write programs for event-handling using various user interface components on applets.

UNIT-I

History of Java, Java buzzwords, datatypes, variables, simple java program, scope and life time of variables, operators, expressions, control statements, type conversion and costing, arrays, classes and objects – concepts of classes, objects, constructors, methods, access control, this keyword, overloading methods and constructors, string handling, StringTokenizer.

UNIT-II

Inheritance: Definition, single inheritance, benefits of inheritance, Member access rules, super class, polymorphism- method overriding, Dynamic method dispatch, using final with inheritance, abstract class, Base class object.

UNIT-III

Interfaces: definition, variables and methods in interfaces, differences between classes and interfaces, usage of implements and extends keyword, uses of interfaces.
Packages: Definition, types of packages, Creating and importing a user defined package.
Applications using interface

UNIT-IV

Exception handling -exception definition, benefits of exception handling, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating user defined exceptions.
Multi-Threading: Thread definition, types of multitasking, uses of multitasking, thread life cycle, creating threads using Thread class and Runnable interface, synchronizing threads, daemon thread.

Applications of multithreading.

UNIT-V

Advantages of GUI over CUI ,The AWT class hierarchy, Component, Frame, user interface components- labels, button, scrollbars, text components, check box, check box groups, choices, lists panels – scroll pane, menu bar, graphics, layout, managers –boarder, grid, flow and card layouts.
Applications: developing calculator, developing feedback form, developing biodata.

UNIT-VI

Event handling: Delegation event model, closing a Frame, mouse and keyboard events, Adapter classes.
Applets – Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.
Applications: Developing of simple advertisements.

TEXT BOOKS

1. Java; the complete reference, 6th editon, Herbert schildt, TMH.
2. Introduction to Java programming 6th edition, Y. Daniel Liang, pearson education.

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Open Elective - II

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8ZC03PRODUCT & SERVICES

Course Objectives: This course helps to provide the basic concepts of Product and Services. This course will enable the students to study areas of basic insights in product management and Services Design.

Course Out Comes:

1) The students will be introduced to basic concepts of product .
2) Will enlighten the students with the process of new product development and stages in the process.
3) Will help the students understand the concept of product testing, product planning and the preparatory groundwork for launching a new product
4) Will help the students to understand the nature of services, its differences with the goods and the application of marketing principles for services.
5) Will enlighten the students to understand the attributes of a good service design and the tools for producing and distributing the services.
6) To make the students understand about the importance of quality of services and also introduce some measurement scales to evaluate the service quality.

UNIT- I

INTERPRETATIONS ON PRODUCT

Meaning of Product, Product Market Fit Analysis, Product Levels, Product Mix, Product Pruning, and Product Cannibalization.Types of Product Classification

UNIT- II

PRODUCT INNOVATION and VALIDATION

New products-What is a new product, New Product Development Process, Idea generationSystems,Concept test,Product testing, Pre-launch,Market test, Final evaluation using “Stage / Gate Process. Product Validity, Break Even Analysis, Financial and Market Analysis.

UNIT- III

LAUNCHING PRODUCT

Cost Analysis, Steps to fix the final price, Promotion planning, Digital Marketing and Methods, Retailing, Types of Retailing online Retailing, Post Market Analysis of the Launch

UNIT - IV: INTRODUCTION TO SERVICE:
Meaning and Definition of Service, Characteristics of Services, Classification of Service, Five levels of Service, Service verses Physical Goods, 7 P's for Marketing of Services, Servicescape

UNIT – V: SERVICE PROCESS DESIGN and SERVICE DISTRIBUTION:
Service Design Meaning, Tools for Service Design, Attributes of a Good Design Customer involvement in the Production Process, Role of Intermediaries, Methods of Distribution of Services

UNIT – VI: QUALITY OF SERVICE:
Definition of Service Quality, Elements of Service Quality, Service Quality Measuring Tools; SERVQUAL Scale, Service Quality Gap Analysis, Objective Service Metrics, Cost of Quality in Service. Challenges and Problems of Service Quality in India.

Essential Readings:

- Dr. S.L. Gupta, Product Management, Wisdom Publications
- C.Merle Crawford ,New Product Management
- Valarie A.Zeithaml& Mary Jo-Bitner: Services Marketing—Integrating Customer Focus Across the Firm, 3/e, Tata McGraw Hill, 2007.
- Thomas J.Delong&Asish Nanda: Managing Professional Servies—Text and Cases, McGraw-Hill International, 2006.
- Christopher Lovelock: Services Marketing People, Technology, Strategy, Fourth Edition, Pearson Education, 2006

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Open Elective - II

8ZC12 ENTREPRENEURSHIP, PROJECT MANAGEMENT AND STRUCTURED FINANCE

Course Objective: The objective of the course is to make students understand the nature of Entrepreneurship, its importance and to create an awareness regarding the systematic planning and implementation of projects; highlight the components of structured finance and establish a framework of CMBS with respect to Servicing Agreements

Course Outcomes:

1. Students will understand the nature of Entrepreneurship andits importance
2. Will gain knowledge regarding project, its life cycle and organization
3. Will gain knowledge relating to project formulation and implementation
4. Comprehend the components of structured finance
5. Establish a framework of CMBS
6. Students will gain knowledge relating to the CRE Servicing

UNIT I

CONCEPTS OF ENTREPRENEURSHIP: Definition of Entrepreneurship, Evolution of Entrepreneurship, Classification of Entrepreneurs**,** Characteristics of Entrepreneur**,** Selection of Product and the means required for starting an enterprise, Financing and Financial incentives available, Success rate of entrepreneurs – a case study.

UNIT-II

BASICS OF PROJECT MANAGEMENT: Concept and characteristics of a project - types of projects - Objectives of project management - Project Organizational structure - Project life cycle - Challenges and problems of project management - Qualities & functions of a project manager.

UNIT III

PROJECT FORMULATION AND IMPLEMENTATION: Generation of Project Ideas; Monitoring the environment; Preliminary Screening of Projects; Feasibility study; Project Selection. Detailed Project Report: Market, Technical, Financial and Economic aspects.Pre-requisites for Successful Project Implementation; Control of in-progress Projects (Gantt chart, PERT, CPM); Project Risk Management Process, Post-audit; Abandonment Analysis

UNIT-IV

INTRODUCTION TO STRUCTURED FINANCE: Term Loans, Bonds/Debentures, Types of debentures, Issue of debt instruments. Structured Finance: Evolution, Securitization process, characteristics, and structured finance products (ABS, CDO, MBS, CDS)

UNIT-V

COMMERCIAL MORTAGAGE LOAN BASICS: Definition and characteristics of CMBS, CMBS Vs other Mortgage Backed Securities, CMBS three level perspective: property level, loan level, bond level; Life cycle of commercial real estate loans – Loan cycle, Key players in loan cycle; Property types and characteristics, property performance.

UNIT-V1

BASICS OF CRE SERVICING: Introduction to servicing, Role of the Servicer, Servicing approaches, Influence of technology, Ethics in commercial servicing, Servicing – sources of income, Overview of servicing agreements, Pooling & Servicing agreement, Sub servicing agreement.

References:

- H. Nandan, Fundamentals of Entrepreneurship, Prentice Hall of India, First Edition, New Delhi, 2007.
- Jeffrey K. Pinto "Project Management", 2nd edition, Pearson
- DhandapaniAlagiri "Structured Finance – Concepts & Perspectives", ICFAI University press.
- Projects by Prasanna Chandra, McGraw-Hill Publishing Co. Ltd
- Project Management: Systems approach to Planning Scheduling and Controlling, H. Kerzner.
- The Complete Real Estate Documents by Mazyar M. Hedayat, John J. Oleary
- The Fundamentals of Listing and Selling Commercial Real Estate - By Keim K. Loren (Author)

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Open Elective - II

8ZC09 CO – CREATION AND PRODUCT DESIGN

Course Objective: The objective of the course is to make students understand the fundamental concepts of design thinking, and to familiarize with product design process and to motivate the students to ideate new products and services.

Course Outcomes:

1. The students gain the knowledge on the inputs required for human centric design thinking the students learn the techniques of idea generation.
2. The students gain knowledge on exploring the different phases of Ideation process.
3. The students grasp the awareness on emerging technologies and understand 3d printing in manufacturing.
4. The students gain familiarity on development of prototypes.
5. The students understand reverse engineering methods in product development.
6. The students have access to information on IPR, and patent application.

Unit – I: Human Centered Design: Understanding user and Customer perspectives, Identify insights and opportunities, Interviewing, User Experience design.Frame your design challenge**.**

Empathy tools and techniques.

Unit – II: Ideation Process: Articulation of Problem Statement, Visualizing Ideas, Communicating ideas and compelling story telling, Brainstorming, Divergent thinking in exploring solutions, 3- box thinking, 3-box framework and Box-3 ideation.

Unit – III: Emerging Technologies and Design: Emerging technologies, utilization and growth, Automation through Industry 4.0, IOT for Network and Intelligent world, efficient and effective manufacturing aided by Robotics, Custom manufacturing by Additive / 3D printing, Augmented reality for product and process.

Unit – IV: Prototyping: Introduction to Prototype, types of prototype, prototyping strategies, Design consideration in the five stages of the product life cycle. Prototype building by different engineering disciplines. Testing Solution and taking the solution to the users. Create a pitch for your design.

Unit – V:Reverse engineering in product development: Reversing engineering methods, identifying the bad features in a product, reduction in size and weight, usage of new

materials,importance of ergonomics in product development, environmental considerations in design, and safety considerations in design.

Unit – VI: Intellectual Property Rights: Introduction to IPR, Patents – Types of Patents, elements of patentability, Patents registration Procedure, Patent office and Appellate Board, Rights and Duties of Patentee, Restoration of Lapsed patents.

Text Book(s)

1. Philip Kosky, Robert T. Balmer, William D. Keat, George Wise, "Exploring Engineering: An Introduction to Engineering and Design", 4th edition, Elsevier, 2016.
2. David Ralzman, "History of Modern Design", 2nd edition, Laurence King Publishing Ltd., 2010 3. An AVA Book, "Design Thinking", AVA Publishing, 2010.
3. Ingle, B. R. (2013). *Design thinking for entrepreneurs and small businesses: Putting the power of design to work*. Apress.
4. Norman, D. A. (2016). *Living with complexity*. MIT press.
5. Chapman, J. (2017). *Routledge handbook of sustainable product design*. Taylor & Francis.
6. Nithyananda, K.V. (2019), IPR, protection and Management, India, Cengage learning India.

Reference Books:

1. G. Pahl, W.Beitz, J. Feldhusen, KH Grote, "Engineering Design: A Systematic Approach", 3rd edition, Springer, 2007. 2. Tom Kelley, Jonathan Littman, "Ten Faces in Innovation", Currency Books, 2006.
2. Kumar, V. (2012). *101 design methods: A structured approach for driving innovation in your organization*. John Wiley & Sons.
3. Chapman, J. (2012). *Designers Visionaries and Other Stories: A Collection of Sustainable Design Essays*. Taylor & Francis.
4. Garrett, J. J. (2010). *The elements of user experience: user-centered design for the web and beyond*. Pearson Education.
5. Neeraj, P. &Khusdeep, D (2014), IPR, India, IN: PHI Learning.

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8K471: FLUID MECHANICS LABORATORY

B.Tech II Year II Sem.

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Pre Requisites: FM Theory

Course Objectives:
To give the student an exposure to various hydraulic devices and Pipe Flow.

Course Outcomes:
At the end of the course, the student will be able to:
1. Determine coefficient of discharge for orifice and mouthpiece.
2. Calibrate notches, venturimeter, orifice meters
3. Determine major and miner losses in pipes

List of Experiments:

1. Verification of the Bernoulli's theorem;
2. Calibration of Venturimeter and Orifice meter;
3. Determination of Friction Factor of Pipe line: Major Losses;
4. Determination of Losses due to Sudden Expansion and Sudden Contraction: Minor Losses;
5. Determination of Coefficients of Discharge for Rectangular, Trapezoidal and V-Notch;
6. Determination of Coefficient of Discharge, Coefficient of Contraction and Coefficient of Velocity Mouthpiece setup;
7. Determination of Coefficient of Discharge, Coefficient of Contraction and Coefficient of Velocity Orifice setup;
8. Calibration of Rotameter and Flow Nozzle meter;
9. Conduct Heleshaw Experiment;
10. Conduct Reynolds's Experiment to determine the Reynolds's number and type of flow.
11. Verification of Water Hammer Condition for Sudden Closure of Valve;

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8K472: ENGINEERING GEOLOGY LABORATORY

B.Tech II Year II Sem.

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Pre Requisites: Engineering Geology Theory

Course Objectives:

The object of this lab is that to provide practical knowledge about physical properties of minerals, rocks, drawing of geological maps, showing faults, uniformities etc.

Course Outcomes:

At the end of the course, the student will be able to identify the various rocks and minerals depending on geological classifications

List of Experiments:

1. Study of physical properties and identification of minerals.
2. Study of physical properties and identification Rock forming minerals.
3. Megascopic description and identification of Rocks.
4. Megascopic description and identification of igneous rocks.
5. Megascopic description and identification of sedimentary rocks.
6. Megascopic description and identification of metamorphic rocks.
7. Structural geology problems simple strike
8. Structural geology problems dip problems (calculation of amount of true dip and direction).
9. Interpretation and drawing of sections for geological maps showing normal beds.
10. Interpretation and drawing of sections for geological maps showing tilted beds.
11. Interpretation and drawing of sections for geological maps showing fault beds.
12. Interpretation and drawing of sections for geological maps showing folded beds.

8K473: MATLAB PROGRAMMING LAB

B. Tech II Year II Sem. **L T P/D C**

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Course Objectives

1. This Lab Course will enable the students to understand the basicsof programming knowledge in MATLAB and use them in civil engineering problems.

Course Outcomes:

1. Students learn the MATLAB environment and its programming fundamentals.
2. Students are able to write Programs using commands and functions.
3. Students are able to use MATLAB for solving a problem encountered in Civil Engineering.

LIST OF EXPERIMENTS

1. Getting Started with Matlab and practicing basic operations; Data types, Constants and Variables, Character constants, operators, Assignment statements.
2. Matrix operations (Additions, subtractions, multiplications) with Control Structures, For/While Loops, If control structures, Switch, Break, Continue statements.
3. Finding Eigen Values and Eigen vectors of Matrices with Input-Output functions, Reading and Storing Data.
4. Determination of Stopping sight distance.
5. Determination of Overtaking sight distance.
6. Roots of quadratic equations
7. Derivations and limits of quadratic equations.
8. Solving simple differential equations.
9. Plots: 2D plots, Printing labels, Grid & Axes box, Text in plot, Bar and Piechart.
10. Solve an Initial value problem using Runge-Kutta method
11. Program to perform the design of Beam for the user input values.
12. Solving any Civil Engineering problem using Matlab

TEXT BOOKS

1. Bansal .R.K, Goel .A.K, Sharma .M.K, “MATLAB and its Applications in Engineering”, Pearson Education, 2012.
2. Amos Gilat, “MATLAB-An Introduction with Applications”, Wiley India.

REFERENCES

1. Stephen J.Chapman, “Programming in MATLAB for Engineers”, Cenage Learning, 2011.

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H: High M: Medium L: Low

B. Tech II Year II Semester
TECHNICAL SEMINAR –IV

Code: 8K491	**L**	**T**	**P**	**C**
	-	**-**	**2**	**1**

Course Objective :

1. Develop ability to be a public speaker with the aid of Power Point Presentations.
2. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts.
3. Practice and develop communication skills and interview performance skills.

Course Outcomes:

1. Demonstrate public speaking with the aid of Power Point Presentations
2. Identify current general and specific technological topics of interest and prepare and present the content cogently.
3. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Content	: 20 marks
Presentation including PPT	: 20 marks
Seminar Notes	: 10 marks
Interaction	: 10 marks
Report	: 25 marks
Attendance	: 10 marks
Punctuality	: 5 marks
Total	**100 marks**