ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

CIVIL ENGINEERING

FOR

B.TECH. FOUR YEAR DEGREE PROGRAMME
(Applicable for the batches admitted from 2015-2016)

I, II, III & IV-Year

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
Bollikunta, Warangal-506 005
Telangana State, India

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Academic Regulations-2015 of B.Tech (Regular) Programme under Choice Based Credit System (CBCS)

(Effective for the students admitted into I-Year from the Academic year 2015-2016)

1. Eligibility for Admission:

1.1 Admission to the Bachelor of Technology (B.Tech) Programme shall be made to a qualified candidate on the basis of the merit rank obtained by him/her at an Entrance Test conducted by the Telangana State Government (TSEAMCET) OR the Jawaharlal Nehru Technological University OR on the basis of any other order of merit approved by the authorized University by the Government, subject to the Rules of Reservations in force on the Telangana State from time to time.

1.2 The medium of instruction for the entire B.Tech programme is in English language.

2. Branches of B.Tech Programme:

The following branches of B.Tech Programme are offered for study.

Code	Branch
01	Civil Engineering
02	Electrical & Electronics Engineering
03	Mechanical Engineering
04	Electronics & Communication Engineering
05	Computer Science & Engineering

3. Credit Courses:

All subjects/ courses are to be registered by a student in a semester to earn credits. Credits shall be assigned to each subject/course in a L:T:P:C (Lecture Periods: Tutorial Periods: Practical Periods: Credits) structure, based on the following table.

	For I-Year-I/II Semester		II,III,IV Years per Semester	
	Periods/Week	**Credits**	**Periods/Week**	**Credits**
Lecture	04	04	04	04
	03	03	03	03
	02	02	02	02
Tutorial	02	01	02	01
Practical	03	02	03	02
Drawing	02T & 04D	04	03	02
Mini Project	-	-	-	04
Comprehensive Viva Voce	-	-	-	04
Seminar	-	-	02	04
Major Project	-	-	15	08

4. Subject/Course Classification:

All the Subjects/Courses offered for the B.Tech are broadly classified as (a) Foundation Courses (FC), (b) Core Courses (CC) and (c) Elective Courses (EC).

i. Foundation Courses (FC) are further categorized as
   a. BSH (Basic Sciences, Humanities and Social Sciences),
   b. ES (Engineering Sciences).

ii. Core Courses (CC) and Elective Courses (EC) are categorized as PS (Professional Subjects), which are further subdivided as
   a. PC (Professional/Departmental Core) subjects,
   b. PE (Professional/Departmental Elective)
   c. OE (Open Electives)
   d. PW (Project Work)

iii. Minor Courses (1 or 2 Credit Courses, belonging to BSH/ES/PC as per relevance); and

iv. Mandatory Courses (MC-non-credit oriented).

4.1 Course Nomenclature:

The Curriculum Nomenclature or Course-Structure Grouping for B.Tech programme is given below:

S. No.	Broad Course Classification	Course Group/ Category	Course Description	Range of Credits
1.	Foundation Courses (FC)	BSH-Basic Sciences, Humanities and Social Sciences	Includes-Mathematics, Physics and Chemistry subjects and subjects related to Humanities, Social Sciences and Management	20%-30%
2.		ES-Engineering Sciences	Includes fundamental engineering subjects	15%-20%
3.	Core Courses (CC)	PC-Professional Core	Includes core subjects related to the parent Discipline/ Department / Branch of Engineering	35%-40%
4.	Elective Courses (EC)	PE-Professional Electives	Includes Elective subjects related to the Parent Discipline/ Department/Branch of Engineering	10%-15%
5.		OE-Open Electives	Elective subjects which include inter-disciplinary subjects or subjects in an area outside the parent Discipline/Department /Branch of Engineering	5%-20%
6.	Core Courses	PW-Project Work	B.Tech. Major Project Work	10%-15%
7.		Mini-Project	Industrial Oriented Training/ Internship /Mini-Project	
8.		Seminar	Seminar based on core contents related to parent Discipline/ Department/Branch of Engineering	
9.		Minor Courses	1 or 2 Credit Courses (Subset of BSH)	Included
10.		Mandatory Courses (MC)	Mandatory Courses (Non-Credit)	-
Total Credits for B.Tech. Programme				**192 (100%)**

5. Course Registration:

5.1 Each student, on admission shall be assigned to a Faculty Advisor/Counselor who shall advise her/him about the academic programmes and counsel on the choice of courses in consideration with the academic background and student's career objectives.

5.2 Faculty advisor shall be only from the engineering departments. With the advice and consent of the Faculty Advisor the student shall register for a set of courses he/she plans to take up for each Semester.

5.3 The student should meet the criteria for prerequisites to become eligible to register for that course.

5.4 A student shall be permitted to register the prescribed credits per semester with a variation of ± 4 credits excluding Laboratories/Seminar/Project. However, registration for Repeat courses of previous semesters (Odd to Odd and Even to Even semesters) is allowed in excess of this limit. This is to encourage the average student to complete 1^{st} year before going to 3^{rd} year and/or complete 2^{nd} year before going to 4^{th} year.

5.5 If a student finds that he/she has registered for more courses than possible to study in a semester, he/she can drop one or more courses before the end of 3^{rd} week of the semester.

5.6 A student is allowed to register for more than 192 credits in completion of B.Tech programme. However, additional credits scored shall not be considered for award of division and also not considered for calculation of Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA). For such extra subject(s) registered a letter grade alone will be indicated in the Grade card as a performance measure.

6. Subjects / Courses to be offered:

6.1 Students shall have to register for the courses during the preparation and practical examinations of the previous semester. However for the first year, the students have to register for courses one week after the commencement of class work.

6.2 The maximum number of students to be registered in each course shall depend upon the physical facilities available.

6.3 The information on list of all the courses offered in every department specifying the credits, the prerequisites, a brief description of syllabus or list of topics and the time slot shall be made available to the student in time.

6.4 In any department, preference for registration shall be given to those students of that department for whom the course is a core course.

6.5 The registration for the inter departmental and/or open elective courses shall be on first come first served basis, provided the student fulfills prerequisites for that course, if any. The number of students to be registered shall be based on the class room and laboratory capacity. Every effort shall be made by the Department/Centre to accommodate as many students as possible.

6.6 More than one teacher may offer the same course in any semester.

6.7 No course shall be offered unless there is a minimum of 20 students or one third of the class strength specified.

7. Distribution and Weightage of Marks:

7.1 The Performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks for theory and 100 marks for practical subjects. In addition, Industry oriented mini-project, Seminar, Comprehensive Viva-Voce and Major Project Work shall be evaluated for 100, 100, 100 and 200 marks respectively.

7.2 For theory subjects the distribution shall be 30 marks for Internal Evaluation and 70 marks for the End-Examination.

7.3 For theory subjects, during the semester there shall be 2 mid-term examinations (internal exams) and two assignments carrying 5 marks each.

7.4 Each mid-term examination of 90 minutes consists of Part-A (objective type) for 10 marks and Part-B (subjective paper) for 15 marks. Mid-term examination paper shall contain 5 questions out of which the student has to answer 3 questions of each 5 marks. First mid-term examination shall be conducted for first 2.5 units (50%) of syllabus and second mid-term examination shall be conducted for remaining 2.5 units (50%) of syllabus. Objective type may be with multiple choice questions, true/false, match type questions, fill in the blanks etc,

7.5 First Assignment should be submitted before the conduct of the first mid-term examination and the second Assignment should be submitted before the conduct of the second mid-term examination. The assignments shall be as specified by the concerned subject teacher.

7.6 The first mid-term examination marks and first assignment marks make first set of internal evaluation and second mid-term examination marks and second assignment marks make second set of internal evaluation marks, and the better of these two sets of marks shall be taken as the final mid-term marks secured by the student towards internal evaluation in that theory subject.

7.7 If a student is absent for any test/assignment, he is awarded zero marks for that test/assignment. However a candidate may be permitted on genuine grounds provided he has taken permission before the mid-term examinations from the Head of the Department. Moreover he has to apply for makeup examinations within a week after completion of mid-term examinations. A subcommittee will be constituted by the College Academic Council to look into such cases. The subcommittee constituted by the College Academic Council may conduct improvement for the internal examinations for theory subjects for the interested candidates.

7.8 For practical subjects there shall be a continuous internal evaluation during the semester for 30 sessional marks and 70 end examination marks. Out of the 30 sessional marks, day-to-day work in the laboratory shall be evaluated for 20 marks and internal examination for practical shall be evaluated for 10 marks conducted by the concerned laboratory teacher. The end examination shall be conducted with one external examiner and one internal examiner. The external examiner shall be appointed from the panel of examiners as recommended by the Board of Studies in respective Branches.

7.9 For the subject having design and/or drawing, (such as Engineering Graphics Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 30 marks for internal evaluation (20 marks for day-to-day work and 10 marks for internal test) and 70 marks for end examination.

7.10 There shall be a mini project preferably suggested by the industry of their specialization, to be taken up during the vacation after III year II semester examination. However, the mini project and its report shall be evaluated in IV Year I-Semester. The mini project shall be submitted in a report form and should be presented before the committee, which shall be evaluated for 100 marks. The committee consists of an External Examiner, Head of the Department, Supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for mini project.

7.11 There shall be a seminar presentation in IV year II semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report and presentation shall be evaluated for 100 marks. There shall be no external examination for seminar.

7.12 There shall be comprehensive Viva-Voce in IV Year II-Semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of (i) Head of the Department (ii) two Senior Faculty Members of the Department. The Comprehensive Viva-Voce is aimed to assess the student's understanding in various subjects he/she studied during the B.Tech Programme. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

7.13 Out of a total of 200 marks for the major project work, 60 marks shall be for internal evaluation and 140 marks for the end semester examination. The end semester examination (Viva-Voce) shall be conducted by a committee. The committee consists of an External Examiner, Head of the Department and the Project Supervisor. The internal evaluation shall be on the basis of two seminars given by each student on the topic of his major project.

7.14 The topics for industry oriented mini project, seminar and major project work shall be different from each other.

8. Attendance Requirements:

8.1 A student shall be eligible to appear for the end examinations if he acquires a minimum of 75% of aggregate attendance in all the subjects.

8.2 Condonation of shortage of attendance in each subject up to 10% on genuine grounds in each semester may be granted by the College Academic Council on recommendation by the Principal.

8.3 Shortage of attendance below 65% shall in no case be condoned.

8.4 Student falling short of attendance as specified above will be detained.

8.5 A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek-re-admission for that semester when offered next. They may seek re-registration for all those subjects registered in that semester in which he got detained, by seeking re-admission for that semester as and when offered; in case 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.

A stipulated fee decided by the College Academic Council shall be payable towards condonation of shortage of attendance.

9. Academic Requirements:

The following academic requirements have to be fulfilled in addition to the attendance requirements mentioned in item no.08.

9.1 A student shall be deemed to have fulfilled the minimum academic requirements and earned the credits allotted to each theory or practical or design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.

9.2 A student shall be promoted from I year to II year only if he fulfills the academic requirement of 24 credits out of 48 credits up to the end of I year from the relevant regular and supplementary examinations, whether he takes those examinations or not.

9.3 A student shall be promoted from II year to III year only if he fulfills the academic requirement of 43 credits out of 72 credits up to II year I semester or 57 credits out of 96 credits secured from all the examinations both regular and supplementary conducted up to end of II year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in II year II semester.

9.4 A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 72 credits out of 120 credits secured from all the examinations both regular and supplementary conducted up to end of III Year I semester or 86 credits out of 144 credits secured from all the examinations both regular and supplementary conducted up to end of III year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II semester.

9.5 A student should earn all credits with an exemption of 8 credits in elective subjects. The marks obtained in the subjects excluding the subjects exempted shall be considered for the final calculation of CGPA and SGPA.

9.6 Student who fails to earn credits with an exemption of eight credits as indicated in the Programme structure within eight academic years from the year of admission shall forfeit his seat in B.Tech. Programme unless an extension is given by College Academic Council to complete the Programme for a further period.

9.7 A student shall register for all subjects covering 192 credits as specified and listed (with the relevant course/subjects classifications as mentioned) in the course structure, put up all the attendance and academic requirements and securing a minimum of P Grade (Pass Grade) or above in each subject, and earn 184 credits securing Semester Grade Point Average (SGPA)$\geq$4.5 in each semester, and Cumulative Grade Point Average (CGPA) $\geq$ 4.5 at the end of each successive semester, to successfully complete the B.Tech Programme.

9.8 When a student is detained due to shortage of attendance in any semester, he may be re-admitted into that semester, as and when offered, with the Academic Regulations of the batch into which he gets readmitted. However, no grade allotments of SGPA/CGPA calculations will be done for that entire semester in which he got detained.

9.9 When a student is detained due to lack of credits in any year, he may be readmitted in the next year, after fulfillment of the academic requirements, with the academic regulations of the batch into which he gets readmitted.

9.10 A student is eligible to appear in the end semester examination in any subject/course, but absent at it or failed (thereby failing to secure P Grade or above), may reappear for that subject/course at the supplementary examinations as and when conducted. In such cases, his internal marks assessed earlier for that subject/course will be carried over, and added to the marks to be obtained in the supplementary examination, for evaluating his performance in that subject.

10. Grading Procedure

10.1 Marks will be awarded to indicate the performance of each student in each Theory Subject, or Lab/Practicals or Seminar or Project or Mini-Project, Minor Course etc., based on the % of marks obtained in End examination, both taken together as specified in item no. 07 above and a corresponding Letter Grade shall be given.

10.2 As a measure of the student's performance, a 10-point Absolute Grading System using the following Letter Grades (UGC Guidelines) and corresponding percentage of marks shall be followed.

Grades and Grade Points

% of Marks obtained in a Course	Letter Grade	Grade Point
>=80 to 100	O (Outstanding)	10
>=70 to < 80	A+ (Excellent)	9
>=60 to < 70	A (Very Good)	8
>=55 to < 60	B+(Good)	7
>=50 to < 55	B (Above Average)	6
>=45 to < 50	C (Average)	5
>=40 to < 45	P (Pass)	4
Less than 40	F (Fail)	0
0	Ab (Absent)	0

10.3 A student obtaining 'F' Grade in any subject shall be considered 'failed' and will be required to reappear as 'Supplementary Candidate' in the End Semester Examination, as and when offered. In such cases, his Internal Marks in those Subject(s) will remain same as those he obtained earlier.

10.4 A Letter Grade does not imply any specific % of Marks.

10.5 In general, a student shall not be permitted to repeat any Subject/Course(s) only for the sake of 'Grade Improvement' or 'SGPA/CGPA Improvement'. However, he has to repeat all the Subjects/Courses pertaining to the Semester, when he is detained (as listed in Item No. 9.8-9.9).

10.6 A student earns Grade Point (G.P.) in each Subject/Course, on the basis of the Letter Grade obtained by him in that Subject/Course (excluding Mandatory non-credit Courses). Then the corresponding 'Credit Points' (C.P.) are computed by multiplying the Grade Point with Credit Points (C.P.) for that particular Subject/Course.

Credit points (C.P.) = Grade Points (G.P.) X Credits …….. For a Course

10.7 The student passes the Subject/Course only when he gets G.P.≥4 (P Grade or above).

10.8 The Semester Grade Point Average (SGPA) is calculated by dividing the Sum of Credit Points (∑C.P.) 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

$$\left\{\sum_{i=1}^{N} C_i G_i\right\} / \left\{\sum_{i=1}^{N} C_i\right\} \quad \ldots. \text{For each semester}$$

Where "i" is the subject indicator index (taken into account all subjects in a semester), 'N' is the number of subjects 'REGISTERED' for the Semester (as specifically required and listed under the Course Structure of the parent Department), and C_i is the number of Credits allotted to the i^{th} subject and G_i is represents the Grade Points (G.P.) corresponding to the Letter Grade awarded for that i^{th} Subject.

10.9 The Cumulative Grade Point Average (CGPA) is a measure of the overall cumulative performance of a student over all Semesters considered for registration. The CGPA is the ratio of the Total Credit Points secured by a student in all registered Courses (with an exemption of 8 credits in electives subjects) in all semesters. CGPA is rounded off to two decimal places. CGPA, is thus computed from the I year, Second- Semester onwards, at the end of each semester, as per the formula.

$$\left\{\sum_{j=1}^{M} C_j G_j\right\} / \left\{\sum_{j=1}^{M} C_j\right\} \ldots \text{for all 'S' semesters registered}$$

(i.e., upto and inclusive of 'S' semester, S≥2)

Where "M" is the total no. of Subjects (as specifically required and listed under the Course Structure of the parent Department) the student has 'REGISTERED' from the 1st Semester onwards upto and inclusive of the semester S (obviously M>N), 'j' is the subject indicator index takes into account all subjects from 1 Subject and $\mathbf{G_i}$ represents the Grade Points (GP) corresponding to the Letter Grade awarded for that j^{th} subject. After registration and completion of I year I semester however, the SGPA of that Semester itself may be taken as the CGPA, as there are no cumulative effects.

10.10 For Merit Ranking or Comparison purpose or any other listing only the rounded off values CGPAs will be used.

10.11 For calculation listed in item no.10.6-10.10**,** 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.

11. Passing Standards:

11.1 A student shall be declared successful or 'passed' in a Semester only when he gets a SGPA≥4.5 (at the end of that particular Semester); and a student shall be declared successful or 'passed' in the B.Tech Programme, only when he gets a CGPA≥4.5; subject to the condition that he secures a GP≥4 (P Grade or above) in every registered Subject/Course in each Semester (during the B.Tech Programme) for the Degree Award, as required.

11.2. In spite of securing P Grade or above in some (or all) Subjects/Courses in any Semester, if a Student receives a SGPA<4.5 and /or CGPA<4.5 at the end of such a Semester, then he may be allowed on the following specific

recommendations of the Head of the Department and subsequent approval from the Principal.

i. to go into the next subsequent Semester (Subject to fulfilling all other attendance and academic requirements as listed under items no.8-9);

ii. to 'improve his SGPA of such a Semester (and hence CGPA to 4.5 or above', by reappearing for one or more as per student's choice or the same subject (s)/courses(s) in which he has secured P Grade (s) in that semester, at the supplementary examinations to be held in the next subsequent semester(s).

In such cases, his internal marks in those subject(s) will remain same as those he obtained earlier. The newly secured letter grades will be recorded and taken into account for calculation of SGPA and CGPA, only if there is an improvement.

11.3. A Student shall be declared successful or 'passed' in any Mandatory (non-credit) Subject /Course, if he secures a 'Satisfactory Participation Certificate' for that course.

11.4 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, Number of Credits, Grade earned etc.), credits earned, SGPA and CGPA.

12. Declaration of Results:

12.1 Computation of SGPA and CGPA are done using the procedure listed in item no.10.6 – 10.10.

12.2 For Final % of Marks equivalent to the computed final CGPA, the following formula may be used:

% of Marks = (Final CGPA – 0.5) X 10

13. Award of Degree:

13.1 A student will be declared eligible for the award of the B.Tech. Degree if he fulfills the following academic regulations:

i. Pursued a course of study for not less than four academic years and not more than eight academic years.

ii. Register for 192 credits and secure 184 credits with an exemption of 8 credits in elective subjects only.

iii. Secures Cumulative Grade Point Average (CGPA) $\geq$4.5.

iv. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course unless extension is granted for a further period by College Academic Council (CAC) to complete the course.

13.2 A student who qualifies for the Award of the Degree as listed in **item 13.1** shall be placed in the following classes.

Award of Division:

S.No	Division	CGPA
1	First Class with Distinction	≥7.5
2	First Class	≥6.5 but less than 7.5
3	Second Class	≥5.5 but less than 6.5
4	Pass Class	≥4.5 but less than 5.5

13.3 A student with final CGPA (at the end of the Course) < 4.5 will not be eligible for the Award of the Degree.

14. Withholding of Results:

If the student has not paid fees to University/College at any stage or has pending dues against his name due to any reason whatsoever, or if any case of indiscipline is pending against him, the result of the student may be withheld, and he will not be allowed to go into the next higher semester. The Award or issue of the Degree may also be with held in such cases.

15. Transitory Regulations:

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 subject/course (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 his I year I Semester).

16. Programme Pattern:

i. The entire course of study is of four academic years. All years shall be on semester pattern i.e two semesters per year. For each semester there shall be a minimum of 90 instruction days.
ii. A student is eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.
iii. There shall be no branch transfers after the completion of admission process.

17. General:

i. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".
ii. Where the words "subject" or "subjects", occur in these regulations, they also imply "course" or "courses".
iii. The academic regulations should be read as a whole for the purpose of any interpretation.
iv. In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Chairman, College Academic Council is final.

Note: ***The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College Authorities.***

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Academic Regulations for B.Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into II-Year from the academic year 2016-2017 and on wards)

1. The students have to acquire all credits from II to IV year of B.Tech. Program (Regular) for the award of the degree. Register all credits and secure all credits with the exemption of 8 credits in elective subjects.

2. Student, who fails to fulfill the requirements for the award of the degree in six consecutive academic years from the year of admission, shall forfeit his seat unless extension is granted by the College Academic Council to complete the Programme for a further period.

3. The same attendance regulations are to be adopted as that of B.Tech. (Regular).

4. **Promotion Rule:**

   i. A student shall be promoted from II year to III year only if he fulfills the academic requirement of 14 credits out of 24 credits up to II year I semester or 29 credits out of 48 credits secured from all the examinations both regular and supplementary conducted up to end of II year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in II year II semester.

   ii. A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 43 credits out of 72 credits secured from all the examinations both regular and supplementary conducted up to end of III Year I semester or 57 credits out of 96 credits secured from all the examinations both regular and supplementary conducted up to end of III year II semester, whether or not the candidate takes the examinations and secures prescribed minimum attendance in III year II semester.

5. All other regulations as applicable for B.Tech. IV year degree course (Regular) will hold good for B.Tech. (Lateral Entry Scheme)

Note: The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the College Authorities.

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MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper Conduct	**Punishment**
	If the candidate:	
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 he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons 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 candidates 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 candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of

		the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. 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 candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall 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-incharge, or any person on duty in or outside the examination hall or any of his relations, or indulges in	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates 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.

	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.	
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 candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
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 candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate 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 candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered

		against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester.
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 candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

CIVIL ENGINEERING

COURSE STRUCTURE
(Applicable for the batches admitted from A.Y. 2015-2016 onwards)

I YEAR **I SEM**

S.No	Code	Subject	L	T	P	Credits
1	A9001	Mathematics-I	4	0	0	4
2	A9012	English	3	0	0	3
3	A9011	Engineering Chemistry	3	0	0	3
4	A9301	Engineering Mechanics-I	2	2	0	3
5	A9304	Engineering Graphics-I	2	0	4	4
6	A9504	Computer Programming	3	0	0	3
7	A9013	English Language Communication Skills Lab	0	0	3	2
8	A9505	Computer Programming Lab	0	0	3	2
Total			**17**	**2**	**10**	**24**

I YEAR **II SEM**

S.No	Code	Subject	L	T	P	Credits
1	A9002	Mathematics-II	3	1	0	4
2	A9009	Engineering Physics	3	0	0	3
3	A9302	Engineering Mechanics-II	3	1	0	4
4	A9305	Engineering Graphics-II	2	0	4	4
5	A9508	OOP and Data Structures	3	0	0	3
6	A9307	Engineering Workshop & IT Work Shop	0	0	3	2
7	A9010	Engineering Physics Lab	0	0	3	2
8	A9509	OOP and Data Structures Lab	0	0	3	2
Total			**14**	**2**	**13**	**24**

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

CIVIL ENGINEERING

COURSE STRUCTURE
(Applicable for the batches admitted from A.Y. 2015-2016 onwards)

II-YEAR **I-SEM**

S.No.	Code	Subject	L	T	P	Credits
1	A9005	Probability & Statistics	3	0	0	3
2	A9101	Strength of Materials - I	4	0	0	4
3	A9203	Basic Electrical and Electronics Engineering	3	1	0	3
4	A9102	Surveying	4	0	0	4
5	A9103	Fluid Mechanics	4	0	0	4
6	A9104	Strength of Materials Lab	0	0	3	2
7	A9105	Surveying Lab-I	0	0	3	2
8	A9204	Basic Electrical and Electronics Engineering Lab	0	0	3	2
9	A9022	Human Values and Professional Ethics	2	0	0	0
		Total	**20**	**1**	**9**	**24**

II-YEAR **II-SEM**

S.No.	Code	Subject	L	T	P	Credits
1	A9106	Building Materials, Construction and Planning	3	0	0	3
2	A9107	Structural Analysis-I	4	0	0	4
3	A9108	Strength of Materials - II	4	0	0	4
4	A9109	Engineering Geology	3	1	0	3
5	A9110	Hydraulics & Hydraulic Machinery	4	0	0	4
6	A9111	Surveying Lab-II	0	0	3	2
7	A9112	Fluid Mechanics & Hydraulic Machinery Lab	0	0	3	2
8	A9113	Engineering Geology Lab	0	0	3	2
9	A9019	Gender Sensitization	2	0	0	0
		Total	**20**	**1**	**9**	**24**

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

CIVIL ENGINEERING

COURSE STRUCTURE
(Applicable for the batches admitted from A.Y. 2015-2016 onwards)

III YEAR **I SEM**

S.No.	Code	Subject	L	T	P	Credits
1	A9114	Design of RC Structures	4	0	0	4
2	A9115	Geotechnical Engineering	3	1	0	3
3	A9116	Concrete Technology	3	0	0	3
4	A9117	Engineering Hydrology	4	0	0	4
5	A9118 A9119 A9120	**Professional Elective-I** RS & GIS Environmental Impact Assessment Structural Analysis-II	3	1	0	3
6	A9621 A9511 A9121	**Open Elective-I** Managerial Economics and Financial Analysis Database Management System Air Pollution and Control	3	0	0	3
7	A9122	Concrete Technology Lab	0	0	3	2
8	A9123	Structural Detailing Lab - RCC	0	0	3	2
9	A9014	Environmental Studies	2	0	0	0
		Total	**22**	**2**	**6**	**24**

III YEAR **II SEM**

S.No.	Code	Subject	L	T	P	Credits
1	A9124	Design of Steel Structures	4	0	0	4
2	A9125	Irrigation Engineering	4	0	0	4
	A9126	Highway Engineering	4	0	0	4
3	A9624 A9625 A9127	**Open Elective-II** Entrepreneurship Development Total Quality Management Disaster Management	3	1	0	3
5	A9128 A9129 A9130	**Professional Elective-II** Foundation Engineering Elements of Earthquake Engineering Advanced Design of RCC Structures	3	1	0	3
6	A9024	Technical Communications Skills Lab	0	0	3	2
7	A9131	Structural Detailing Lab – Steel	0	0	3	2
8	A9132	Geo Technical Engineering Lab	0	0	3	2
		Total	**18**	**2**	**9**	**24**

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

CIVIL ENGINEERING

COURSE STRUCTURE
(Applicable for the batches admitted from A.Y. 2015-2016 onwards)

IV YEAR **I SEM**

S.No.	Code	Subject	L	T	P	Credits
1	A9133	Estimating & Costing	4	0	0	4
2	A9134	Environmental Engineering	3	1	0	3
3	A9135 A9136 A9137	**Professional Elective-III** Pre stressed Concrete Ground Improvement Techniques Solid Waste Management	3	1	0	3
4	A9138 A9139 A9140	**Professional Elective-IV** Watershed Management Transportation Engineering Bridge Engineering	3	1	0	3
5	A9141 A9142 A9143	**Professional Elective-V** Rehabilitation & Retrofitting of structures Industrial Waste Water Treatment Design & Drawing of Irrigation Structures	3	1	0	3
6	A9144	Environmental Engineering Lab	0	0	3	2
7	A9145	Highway Engineering Lab	0	0	3	2
8	A9146	Structural Drafting Lab – Open Source Software	0	0	3	2
9	A9147	Industry Oriented Mini Project	0	0	0	2
		Total	**16**	**4**	**9**	**24**

IV YEAR **II SEM**

S.No.	Code	Subject	L	T	P	Credits
1	A9148 A9149 A9150	**Professional Elective-VI** Pavement Design Earth and rock fill dams Finite Element Method	3	1	0	3
2	A9151 A9330 A9218	**Open Elective-III** Construction Technology and Project Management Nanotechnology Renewable Energy Sources	3	1	0	3
3	A9152	Comprehensive Viva	0	0	0	3
4	A9153	Seminar	0	0	3	3
5	A9154	Project	0	0	15	12
		Total	**6**	**2**	**18**	**24**

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9001) MATHEMATICS-I

I Yr. I Sem: Common to all branches	**L**	**T**	**P**	**C**
	4	**0**	**0**	**4**

Course Objective:

The main aim of teaching Engineering Mathematics-I is to emphasize the relevance of fundamentals and applications of Mathematics in Engineering field. Mathematics is the basic of all branches of modern business and science and technology. It deals with using the constructive results of mathematics to solve a problem in applied science or Engineering field.

It helps the students in choosing a technique that improve the quality and efficiency of actual computation.

UNIT–I:
Ordinary differential equations of first order:
Formation of differential equations**,** solution of differential equations of First order and First degree. Exact differential equations, Non exact differential equations, Bernouli's Differential equations, Orthogonal Trajectories.

UNIT-II:
Ordinary linear differential equations of higher order:
Homogenous, Non Homogenous linear differential equations of higher order of the form e^{ax}, Sinax, Cosax, Polynomials in x, e^{ax} v(x), x^k v(x), Method of variation of parameters.

UNIT – III:
Differential calculus:
Rolle's Mean Value theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem, Taylor's Theorem (without proof). Jacobian, Maxima and Minima of functions of two variables.

UNIT – IV:
Improper integration and multiple integrals:
Multiple integrals - Double & Triple integrals. Change of variables and Change of order of integration.

UNIT – V:
Laplace Transformation:
Laplace transform - Inverse Laplace transform - properties of Laplace transforms - Laplace transforms of unit step function, impulse function & periodic function, convolution theorem (without proof), applications of ordinary differential equations.

Learning Outcomes:

1. By learning the first order differential equations student can able to find the solutions of many applications in engineering field.
2. By studying the higher order differential equation many of the transcendental equations are solvable very easily.
3. By studying the mean value theorems student can find roots of the algebraic and transcendental equations.
4. By studying the applications of integration the student able to study find area, surface and volume of a revolution.
5. The students understand how to find the solution of initial and boundary value problem without finding general solution by Laplace technique.

Recommended Text Books:

1. R. K. Jain and S. R. K. Iyengar: Advanced Engineering Mathematics, Narosa Publishing House, 2008
2. B. S. Grewal: Higher Engineering Mathematics, Khanna Publications, 2009.

Reference Book:

1. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
2. T. K. V. Iyengar: Engineering Mathematics-I, S. Chand and Company.
3. A textbook of Engineering Mathematics Vol-I by P.B.Bhaskara Rao, S.K.V.S. Rama chary.
4. A textbook of Engineering Mathematics Vol-I by C. Shankaraiah, VGS Book Link.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9012) ENGLISH

I year B. Tech. I Sem common to all branches

L	T	P	C
3	0	0	3

Introduction:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.

Course Objectives:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

- To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
- To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Role play – Individual/Group activities (Using exercises from all the **six** units of the prescribed text: ***Skills Annexe: Functional English for Success*.)**
- Just A Minute(JAM) Sessions.

Reading Skills:

Objectives

To develop an awareness in the students about the significance of silent reading and comprehension.

- To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
- Scanning
- Recognizing coherence/sequencing of sentences

NOTE : *The students will be trained in reading skills using the prescribed text for detailed study.*

They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills:

Objectives:

- To develop an awareness in the students about writing as an exact and formal skill
- To equip them with the components of different forms of writing, beginning with the lower order ones. Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:

For Detailed study

- First Textbook entitled **"*Skills Annexe -Functional English for Success*",** Published by Orient Black Swan, Hyderabad
- The Second Textbook entitled **"*Epitome of Wisdom*",** published by Maruthi Publications, Hyderabad.

The course content and study material is divided into **Five Units.**

Unit – I:

Importance of communication in English-Globalisation-changing trends-barriers to communication

Unit –II:

- Chapter entitled '***Wit and Humour***' from 'Skills Annexe' -Functional English to Success Published by Orient Black Swan, Hyderabad
- Chapter entitled **'*Mokshagundam Visvesvaraya*'** from *"Epitome of Wisdom",* Published by Maruthi Publications, Hyderabad.

and

G-Types of Nouns and Pronouns

V- Homonyms, homophones synonyms, antonyms

Unit –III

- Chapter entitled "***Advances in Science and Technology"*** from "***Skills Annexe - Functional English for Success***" Published by Orient Black Swan, Hyderabad.
- Chapter entitled **'*Three days To See*'** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

G- Verb forms

V- Noun, verb, adjective and adverb

Unit –IV

- Chapter entitled **'*Risk Management*'** from **"*Skills Annexe -Functional English for Success*"** Published by Orient Black Swan, Hyderabad.
- Chapter entitled **'*Leela's Friend*'** by R.K. Narayan from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

G – Present tense

V – Synonyms and Antonyms

Unit –V

- Chapter entitled '***Human Values and Professional Ethics'*** from "***Skills Annexe - Functional English for Success"*** Published by Orient Black Swan, Hyderabad.
- Chapter entitled ***'The Last Leaf'*** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

G- Past and future tenses

V- Vocabulary - idioms and Phrasal verbs

* Exercises from the texts not prescribed shall also be used for classroom tasks.

Course Outcomes

- Usage of correct English Language, written and spoken
- Enrichment of comprehension and fluency
- Gaining confidence in using language in varied situations

Suggested Reading:

1. ***Contemporary English Grammar Structures and Composition*** by David Green, MacMillan Publishers, New Delhi. 2010.
2. **Innovate with English: A Course in English for Engineering Students,** edited by T Samson, Foundation Books.
3. English for Employability-**K. Purushotham, Orient Blackswan** (with CD).
4. Listening & Speaking Skills **Book I and Book II, Cambridge Publishers** (with CD's).
5. English Grammar Practice**, Raj N Bakshi, Orient Longman.**
6. **Technical Communication** by Daniel Riordan. 2011. **Cengage Publications. New Delhi.**
7. **Effective English, edited** by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by **Pearson**
8. Handbook of English Grammar and Usage**, Mark Lester and Larry Beason, Tata Mc Graw –Hill.**
9. Spoken English**, R.K. Bansal & JB Harrison, Orient Longman.**
10. Technical Communication, **Meenakshi Raman, Oxford University Press**
11. Objective English **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
12. Grammar Games**, Renuvolcuri Mario, Cambridge University Press.**
13. Everyday Dialogues in English**, Robert J. Dixson, Prentice Hall India Pvt Ltd.,**
14. ABC of Common Errors **Nigel D Turton, Mac Millan Publishers.**
15. Basic Vocabulary **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
16. Effective Technical Communication**, M Ashraf Rizvi, Tata Mc Graw –Hill.**
17. An Interactive Grammar of Modern English, **Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO**
18. A Communicative Grammar of English, **Geoffrey Leech, Jan Svartvik, Pearson Education**
19. Enrich your English, **Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,**
20. A Grammar Book for You And I, **C. Edward Good, MacMillan Publishers.**
21. Practical English Usage **(ELBS) Michael Swan.**
22. Examine Your English – **Margaret Maison.**
23. The Parts of Speech: **Prof. P. Satyanarayana, P.C. Ray Publications,** Warangal, 2003.
24. The Tense: **Prof. P. Satyanarayana, P.C. Ray Publications,** Warangal 2003

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9011) ENGINEERING CHEMISTRY

I Year B. Tech. I-SEM CIVIL, MECH. & EEE	L	T	P	C
II-SEM ECE & CSE	3	0	0	3

Course Objectives:

The purpose of these courses is to emphasize the relevance of fundamentals and applications of chemical sciences in the field of engineering. Thus, the courses have been conceived in such a way that they take into account appropriate combinations of old and new emerging concepts in the chemical sciences area and their current and potential uses in engineering. The Courses attempt to address the principles of general chemistry and specific topics relevant to various engineering disciplines, wherein the students can apply this learning in their respective areas of expertise.

The syllabus has sought to fulfill the objective of making the student of engineering and technology realize that chemistry like other subjects is the real base of their profession and that therefore they must have a good understanding of chemistry before they can use it in their profession.

UNIT- 1:
Electro Chemistry
Ohm's law, conductance, specific, equivalent and molar conductance, units and their relation. Numerical Problems. EMF: Electrochemical and Electrolytic cells, Galvanic cell, Electro chemical series, measurement of emf and single electrode potential, Nernst's equation and its applications,

UNIT- 2:
Electrodes and Battery Chemistry
Introduction, Types of electrodes: Reference electrodes (SHE, SCE and QH). Determination of PH. Numerical Problems. Batteries: Primary cells-Dry cell, Secondary cells - Pb-Acid storage cell, Fuel cells- Hydrogen-Oxygen fuel cell.

UNIT–3:
Corrosion and Its control
Introduction, Causes of corrosion, Types of corrosion- Dry and Wet corrosion (Galvanic & concentration). Factors affecting on corrosion, Corrosion controlling methods- Cathodic protection and Surface coatings (anodic and Cathodic), Methods of applications of metal coatings- Hot dipping and electroplating.

UNIT-4:
Polymer Chemistry
Introduction, Functionality of Monomers, classification of polymers, Types of polymerization, Mechanism of polymerization: Chain and step. Plastics: Chemistry of Thermoplastic resins (PE, PVC & PS) and thermosetting resins (Nylon & Bakelite).

UNIT – 5:

Water Chemistry

Introduction, Types of hardness, units and Numerical problems, Estimation of hardness of water-EDTA method. Boiler Troubles, caustic embrittlement & Boiler corrosion. Treatment of Boiler feed water- Zeolite and Ion-exchange process.

Course Outcomes:

- Applications of electrochemistry understanding different types of cells, their representation, knowledge of electrode potentials, utilization of electrical energy and its conversation into different energies.
- Applicability of electrodes in different fields of analysis.
- Understanding the utility of batteries as a source of energy in many electronic gadgets & their types.
- Enhancement of power generation by making of fuel cells. Knowledge of need for alternate source of energy.
- Deterioration of metal under the influence of environment, Mechanism of corrosion, Factors affecting corrosion, Prevention of corrosion using various methods & A basic knowledge of surface coatings.
- Improving the properties of plastics by various additives, Integral role of various polymers in our life style & Applicability of plastic in automobile and textile industry.
- Knowledge of hardness of water and its effects, Industrial utility of water especially for steam generation, Removal Methodologies of hardness.

Text Books:

1. Text Book of Engineering Chemistry by C. Parameshwara Murthy. B.S. Publications
2. Text Book of Engineering Chemistry by Y. Bharathi kumari and Jyotsna Cherikuri, VGS Publications.
3. Text Book of Engineering Chemistry by Shashi Chawla
4. Text Book of Engineering Chemistry by B. Ramadevi & Ch. Venkata Ramana Reddy, CENGAGE Learning 2012.

Reference Books:

1. Elementary principles of Physical Chemistry by P.W. Atkins, Oxford University Press.
2. Physical Chemistry by Puri & Sharma
3. Engineering Chemistry by Jain & Jain
4. Engineering Chemistry by Shashi Chawla.
5. Polymer Chemistry by Gourikar.
6. Physical Chemistry Glastone.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9301) ENGINEERING MECHANICS-I

I-Year I-Sem: Civil, Mech	**L**	**T**	**P**	**C**
	2	**2**	**0**	**3**

COURSE OBJECTIVES:

1. Understand the basic principles of static's applicable to rigid bodies in equilibrium
2. Apply static principles to the solution of a variety of practical problems.
3. Determine the Frictional Forces when the bodies are under motion.
4. Determine the centre of gravity of Simple figures, composite figures and its applications
5. Determine the Moment of inertia of Simple figures, composite figures and its applications
6. Determine mass moment of inertia of simple objects, composite bodies.

UNIT – I

Introduction to Engineering Mechanics – Basic Concepts.

Resultants of Force System: Parallelogram law –Forces and components- Resultant of coplanar Concurrent Forces – Moment of Force -principle of moments – Coplanar Applications – Couples -Resultant of any Force System.

UNIT – II

Equilibrium of Force Systems : Free Body Diagrams, Equations of Equilibrium - Equilibrium of planar Systems .

UNIT – III

FRICTION: Introduction – Theory of Friction – Angle of friction - Laws of Friction – Static and Dynamic Frictions –Motion of Bodies: Screw, Screw-jack and Differential Screw-jack.

Transmission of Power: Flat Belt Drives - Types of Flat Belt Drives – Length of Belt, tensions, Tight side, Slack Side, Initial and Centrifugal – Power Transmitted and Condition for Max. Power.

UNIT – IV

CENTROIDS AND CENTERS OF GRAVITY: Introduction – Centroid and Centre of gravity of simple figures (from basic principles) – Centroid of Composite Figures – Center of gravity of bodies and centroid of volumes.

UNIT – V

Moments of Inertia : Definition – Polar Moment of Inertia –Radius of gyration - Transfer formula for moment of inertia - Moments of Inertia for Composite areas - Products of Inertia, Transfer Formula for Product of Inertia.

Mass Moment of Inertia : Moment of Inertia of Masses- Transfer Formula for Mass Moments of Inertia - mass moment of inertia of composite bodies.

TEXT BOOKS:

1. Engg. Mechanics / S.S. Bhavikatti & K.G. Rajasekharappa / Third edition /New age International Publishers
2. Engineering Mechanics - Statics and Dynamics by Ferdinand.L. Singer / Harper International Edition.
3. Engineering Mechanics/ S. Timoshenko and D.H. Young / Mc Graw Hill Book Company.

REFERENCES:

1. Engineering Mechanics / Irving Shames / Prentice Hall
2. Engg. Mechanics / M.V. Seshagiri Rao & D Rama Durgaiah/ Universities Press
3. Engineering Mechanics, Umesh Regl / Tayal.
4. Engg. Mechanics / KL Kumar / Tata McGraw Hill.

COURSE OUTCOMES:

The students will be able to

1. Apply engineering science principles to develop algebraic relationships among key physical parameters and variables based on analysis of a specified system
2. Apply the principles of mechanics for solving practical problems related to equilibrium of rigid bodies and particle in motion.
3. Use references that provide tabulated physical data that are useful for mechanical engineers.
4. Deal the subjects like Mechanics of Solids, Mechanics of Fluids and Design of machines etc. in higher classes with an ease.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
(A9304) ENGINEERING GRAPHICS –I

I Year I –Sem: Mechanical, Civil

L	T	P	C
2	0	4	4

COURSE OBJECSTIVES:

1. Use various engineering drawing instruments.
2. Learn the basic conventions of drawings, dimensioning, scales and conic sections like ellipse, parabola and hyperbola.
3. Learn projections of points, lines viewed in different positions
4. Learn projections of plane surfaces and solids viewed in different positions.
5. Gain knowledge of sections of solids and their usage in real time applications.

UNIT-I

INTRODUCTION TO ENGINEERING DRAWING: Principles of Engineering Graphics and– Various Drawing instruments – Conventions in Drawing – Lettering Practice – BIS Conventions.

Curves: Constructions of Curves used in Engineering Practice:

a) Conic Sections – General method only.
b) Cycloid. Epicycloid and Hypocycloid
c) Involute
d) Scales: Constructions of different types of Scales, Plain, Diagonal, Vernier scale.

UNIT- II

ORTHOGRAPHIC PROJECTIONS IN FIRST ANGLE PROJECTION:

IN FIRST ANGLE PROJECTION: Principles of Orthographic Projections – Conventions – First and Third Angle . Projections of points

PROJECTIONS OF LINES: Parallel, Perpendicular inclined to one plane and inclined to both planes. True lengths. traces.

UNIT - III

PROJECTIONS OF PLANES: Plane parallel, perpendicular and inclined to one reference plane. Plane inclined to both the reference planes.

UNIT – IV

PROJECTIONS OF SOLIDS: Projections of regular solids. Cube, prisms, pyramids, tetrahedron, cylinder , Cylinder and cone, axis inclined to both planes.

UNIT – V

SECTIONS AND SECTIONAL VIEWS: Right Regular Solids – Prism, Cylinder, Pyramid, cone – Auxiliary views.

TEXT BOOKS

1. Engineering Drawing – Besant, Agrawal, TMH
2. Engineering Drawing. N.D.Bhatt

REFRENCES:

1. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
2. Engineering drawing – P.J.Shan S.Chand Publihers.
3. Engineering Drawing – Johle/Tata Macgraw Hill Book Publishers.
4. Engineering Drawing – M.B.Shah and B.C.Rana, pearson.
5. Engineering Drawing by K.Venu Gopal & V.Prabu Raja New Age publications.
6. Engineering Drawing by John. PHL Learning Publisher.

COURSE OUTCOMES:

1. Understand the usage of various Engineering Drawing instruments.
2. Gain knowledge about conventions of drawings, dimensioning, scales and conic sections and applications of this knowledge is design of machine parts.
3. Understand the projections of plane surfaces and solids.
4. Understand the sections of solids and there usages in real time applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9504) COMPUTER PROGRAMMING

I Year I-Sem: Civil & Mech	**L/T/P**	**C**
	3/0/0	**3**

Objectives:

To provide the necessary knowledge and training for step by step computer program development and to present the basic concepts in C programming language and to prepare the students to write modular and readable C Programs

Syllabus Content

UNIT-1

Introduction to Computers: Computer Systems, Computing Environments, Computer Languages, Creating and running programs, Software Development Method, Algorithms, Pseudo code, flow charts, applying the software development method.

Introduction to C Language: Background, Simple C programs, Identifiers, Basic data types, Variables, Constants, Input / Output, Operators. Expressions, Precedence and Associatively, Expression Evaluation, Type conversions, Bit wise operators, Statements, Simple C Programming examples.

Selection Statements: if and switch statements, Repetition statements – while, for, do-while statements, Loop examples, other statements related to looping – break, continue, go to, Simple C Programming examples.

UNIT-2

Designing Structured Programs: Functions, basics, user defined functions, inter function communication,

Standard functions: Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion- recursive functions, Preprocessor commands, example C programs

Arrays: Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays, C program examples.

UNIT-3

Pointers: Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, memory allocation functions, array of pointers, programming applications, pointers to void, pointers to functions, command –line arguments.

UNIT-4

Strings: Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, C program examples.

Derived types: Structures – Declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bit fields, enumerated types, C programming examples.

UNIT-5

Sorting: Selection sort, Bubble sort, Insertion sort, merge sort, quick sort.

Searching: Linear and Binary search methods.

Input and Output: Concept of a file, streams, standard input / output functions, formatted input / output functions, text files and binary files, file input / output operations, file status functions (error handling), C program examples.

Text Books:

1. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press
2. *C Programming & Data Structures*, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

References:

1. *C Programming & Data Structures*,E.Balagurusamy,TMH.
2. *C Programming with problem solving*, J.A. Jones & K. Harrow, dreamtech Press
3. *Programming in C* – Stephen G. Kochan, III Edition, Pearson Eductaion.
4. *C for Engineers and Scientists*, H.Cheng, Mc.Graw-Hill International Edition
5. *The C Programming Language*, B.W. Kernighan and Dennis M.Ritchie, PHI/Pearson Education

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.

CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.

CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.

CO-4: A recognition of the need for, and an ability to engage in life-long learning.

Learning Outcomes:

1. Understanding the fundamentals of C programming.
2. Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
3. Implementing different operations on arrays and creating and using of functions to solve problems.
4. Designing of linear data structures stacks, queues and linked lists. Learning of different searching and sorting techniques and ability to compare differences in performances.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9013) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

	L	T	P	C
I year B. Tech. I Sem EEE, ECE, CIVIL & MECH				
II Sem CSE	**0**	**0**	**3**	**2**

The **Language Lab** focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Course Objectives:

- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Syllabus:

English Language Communication Skills Lab shall have two parts:

a. Computer Assisted Language Learning (CALL) Lab

b. Interactive Communication Skills (ICS) Lab

The following course content is prescribed for the **English Language Communication Skills Lab**

Exercise-I

CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants

ICS Lab: Ice-Breaking Activity and JAM Sessions

Intensive Practice in Articles, Prepositions, Word Formation- Prefixes & Suffixes, Synonyms & Antonyms with Software/Handouts

Exercise-II

CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.

ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing Others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Concord (Subject in agreement with verb) and Words Often Misspelt- Confused/Misused

Exercise-III

CALL Lab: Minimal Pairs- Word Accent and Stress Shifts- Listening Comprehension.

ICS Lab: Descriptions- Narrations- Giving Directions and Guidelines.

Sequence of Tenses, Question Tags and One Word Substitutes.

Exercise-IV
CALL Lab: Intonation and Common Errors in Pronunciation.
ICS Lab: Extempore- Public Speaking
Active and Passive Voice, –Common Errors in English, Idioms and Phrases

Exercise-V
CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice
ICS Lab: Information Transfer- Oral Presentation Skills
Reading Comprehension and Job Application with Resume Preparation.

Course Outcomes:
- Better Understanding of nuances of language through audio- visual experience and group activities
- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students

Minimum Requirement of Infrastructural Facilities for ELCS Lab:

1. Computer Assisted Language Learning (CALL) Lab:
The Computer Aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.
System Requirement (Hardware Component):
Computer network with LAN with minimum 60 multimedia systems with the following specifications:

i) P – IV Processor
   a) Speed – 2.8 GHZ
   b) RAM – 512 MB Minimum
   c) Hard Disk – 80 GB
ii) Headphones of High Quality

2. Interactive Communication Skills (ICS) Lab :
The Interactive Communication Skills Lab: A spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system, camcorder etc.
Prescribed Lab Manual: A Manual entitled "***English Language Communication Skills (ELCS) Lab Manual- cum- Work Book****"*, published by Cengage Learning India Pvt. Ltd, New Delhi. 2013.
- *In addition to the prescribed lab manual, all the listening and speaking activities mentioned in Text-1 and Text-2 can be conducted in the English Language Communication Skills Lab.*

Suggested Software:
- **Macmilan Dictionary Modern English** (with CD)**.**
- **Oxford Advanced Learners' Dictionary** (with CD).
- **Cambridge Advanced Learners' English Dictionary with CD.**
- **Grammar Made Easy by Darling Kindersley**
- **Punctuation Made Easy by Darling Kindersley**
- Clarity Pronunciation Power – Part I

- Clarity Pronunciation Power – part II
- **Oxford Advanced Learner's Compass, 8th Edition**
- ***DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.***
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge**
- **English Pronunciation in Use** (Elementary, Intermediate, Advanced) Cambridge University Press
- Raman, M & Sharma, S. 2011. Technical Communication, OUP
- Sanjay Kumar & Pushp Lata. 2011. Communication Skills, OUP

Suggested Reading:

1. Situational Enlgish, Prof. Damodar 33 situations BIE Publications (with CD)
2. Radio lessons, Prof. G. Damodar.
3. Rama Krishna Rao, A. *et al. English Language Communication Skills – A Reader cum Lab Manual Course Content and Practice.* Chennai: Anuradha Publishers
4. Suresh Kumar, E. & Sreehari, P. 2009. *A Handbook for English Language Laboratories.* New Delhi: Foundation
5. *Speaking English Effectively* 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
6. Sasi Kumar, V & Dhamija, P.V. *How to Prepare for Group Discussion and Interviews.* Tata McGraw Hill
7. Hancock, M. 2009. *English Pronunciation in Use. Intermediate.* Cambridge: CUP
8. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
9. Hewings, M. 2009. *English Pronunciation in Use. Advanced.* Cambridge: CUP
10. Marks, J. 2009. *English Pronunciation in Use. Elementary.* Cambridge: CUP
11. Nambiar, K.C. 2011. *Speaking Accurately. A Course in International Communication.* New Delhi : Foundation
12. Soundararaj, Francis. 2012. *Basics of Communication in English. New Delhi: Macmillan*
13. *Spoken English* (CIEFL) in 3 volumes with 6 cassettes, OUP.
14. *English Pronouncing Dictionary* Daniel Jones Current Edition with CD.
15. *A Textbook of English Phonetics for Indian Students* by T.Balasubramanian (Macmillan)
16. *Topical Thoughts – (A Textbook of Reading and Writing Skills) Dr.P. Satyanarayana, Vaagdevi College of Engineering, Warangal Publications, 2013.*

DISTRIBUTION AND WEIGHTAGE OF MARKS

English Language Laboratory Practical Examination:

- The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.

For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year- end Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department .of the same institution.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9505) COMPUTER PROGRAMMING LAB

I Year I-Sem: Civil & Mech.	**L/T/P**	**C**
	0/0/3	**2**

Objectives:

To provide the necessary knowledge and practical training for step by step computer program development and to apply the basic concepts in C programming language and to train the students to write modular and readable C Programs.

Syllabus Content

1.a Write a C program to find the sum of individual digits of a positive integer.

1.b Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

1.c Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

2.a Write a C program to find the roots of a quadratic equation.

2.b Write a C program to find the factorial of a given integer.

2.c Write a C program to find the GCD (greatest common divisor) of two given integers.

3.a Write a C program to solve Towers of Hanoi problem.

3.b Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

3.c Write a C program to find both the largest and smallest number in a list of integers.

4. Write a C program that uses functions to perform all of the following:
   - i. Reading of a matrix.
   - ii. Printing a matrix in a formatted form.
   - iii. Adding two compatible matrices to produce a result matrix
   - iv. Multiplying two compatible matrices to produce a result matrix.

5. Write a C program that uses functions to perform the following operations:
   - i. To insert a sub-string in to a given main string from a given position.
   - ii. To delete n Characters from a given position in a given string.
   - iii. Write a C program to determine if the given string is a palindrome or not.

6.a Write a C program using pointer to create a two dimensional matrix, to input values in to the matrix and to display the matrix and its transpose. Free the memory properly.

6.b Write a C program to demonstrate calling of a function (like add,subtract,multiply) using a function pointer.

7.a Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn't contain T.

7.b Write a C program to count the lines, words and characters in a given text.

8.a Write a C program to generate Pascal's triangle.

8.b Write a C program to construct a pyramid of numbers.

9. Write a menu driven C program that uses functions to perform the following operations on complex numbers stored in a structure:
   i. Reading a complex number
   ii. Writing a complex number
   iii. Addition of two complex numbers
   iv. Multiplication of two complex numbers

10. Write a C program that implements the following sorting methods to sort a given list of integers in ascending order
    i) Bubble sort ii) Selection sort

11. Write a C program that implements the merge sort method to sort a given list of integers in ascending order.

12. Write a C program that implements the quick sort method to sort a given list of integers in ascending order.

13. 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

14.a Write a C program which copies one text file to another text file and verify the correctness.

14.b Write a C program which copies one binary file to another binary file and verify the correctness.

15.a Write a command-line C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line.)

15.b Write a C program to display the contents of a file.

16.a Write a C program to produce reverse of the content of a text fie into another text file and verify the result.

16.b Write a C program to merge two text files into a third text file (i.e., the contents of the first file followed by those of the second are put in the third file) and verify the correctness.

Text Books:

1. C Programming & Data Structures, P. Dey, M Ghosh R Thereja, Oxford University Press.

2. *C Programming & Data Structures*, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

References:

1. *C& Data structures* – P. Padmanabham, Third Edition, B.S. Publications.
2. *C& Data structures* – E V Prasad and N B Venkateswarlu, S.Chand&Co.
3. *C Programming & Data Structures*,E.Balagurusamy,TMH.
4. *C Programming with problem solving*, J.A. Jones & K. Harrow, dreamtech Press
5. *Programming in C* – Stephen G. Kochan, III Edition, Pearson Eductaion.
6. *C for Engineers and Scientists*, H.Cheng, Mc.Graw-Hill International Edition
7. *Data Structures using C* – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI
8. *The C Programming Language*, B.W. Kernighan and Dennis M.Ritchie, PHI/Pearson Education

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
CO-4: A recognition of the need for, and an ability to engage in life-long learning.

Learning Outcomes:

1. Understanding the fundamentals of C programming.
2. Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
3. Implementing different operations on arrays and creating and using of functions to solve problems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9002) MATHEMATICS-II

I Yr. II Sem: Common to all branches

L	T	P	C
3	1	0	4

Course Objective:

The main aim of this subject is to improve the mathematical knowledge of the student. When the student study the mathematics-II he should get the impression that mathematics is a systematic science of practical importance, resting on a relatively small number of basic concepts and involving powerful unifying methods. He should soon convince himself of the necessity for applying mathematical procedures to engineering problem.

By studying the mathematics the students translating the given physical information into mathematical model. This model may be a differential equation, a system of equation or some other mathematical expression.

Unit-I :
Solution of Linear System:
Matrix and types of Matrices Elementary row and column operations on a matrix, Rank of matrix –Echelon and Normal form, Linear dependence and independence of vectors, solutions of systems of linear equations using elementary operations.

Unit-II:
Eigen values and Eigen vectors:
Eigen values and Eigen vectors of a matrix and their properties, Cayley-Hamillton theorem and its applications, Complex matrices-Hermitian, Skew-Hermitian and Unitary matrices.

Unit – III:
Fourier series:
Determination of Fourier Coefficients, Even and Odd functions, Half Range Fourier Sine and Cosine expansions Fourier series in an arbitrary interval.

Unit - IV:
Vector Calculus:
Scalar and Vector fields; directional derivatives - Gradient of scalar field, Divergence and Curl of a vector field -Vector integration: Green's theorem, Gauss Divergence theorem, Stoke's theorem (without proof).

Unit – V:
Partial differential equation:
Formation of partial differential Equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear and
non-linear Equations. Method of separation of variables.

Learning Outcomes:

1. The student learns about the rank of the matrix and solving of system of simultaneous linear equations.
2. The student learns about how to find the eigen values and eigen vectors of different engineering fields and they use concept of matrices in the development of programming languages.
3. By studying the Fourier series & Fourier transforms students are able to solve the problem related to theory of circuits and many applications in electronics engineering and communication engineering.
4. The concept of vector integrations (Green's, Gauss & Stoke's theorems), students are able to convert double integration into line integrations and triple integrations.
5. By studying the partial differential equation students are able to solve the many applications of mechanical and civil Engineering.

Recommended Text Books:

1. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics, Narosa Publishing House, 2008
2. B. S. Grewal : Higher Engineering Mathematics, Khanna Publications, 2009.

Reference Book:

1. T.K.V.Iyengar:Mathematical Methods, S.Chand and Company.
2. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
3. A textbook of Engineering Mathematics Vol-I by P.B.Bhaskara Rao, S.K.V.S. Rama chary
4. A textbook of Engineering Mathematics Vol-I by C. Shankaraiah, VGS Book Link

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9009) ENGINEERING PHYSICS

I Year B. Tech. II Sem: CIVIL & MECH

L	T	P	C
3	0	0	3

Course Objectives:

- Physics is the mother of engineering and technology. Without the applications of concepts of physics there can be no technological developments. Hence physics is the foundation on which stands the elaborate structure of technology. The main purpose of teaching physics to engineering under graduates is to acquaint the budding engineers with a thread of development. The aim of Physics is to provide an adequate exposure and develop insight about the basic principles of physics along with the engineering applications. The acquaintance of basic physics principles would help the engineers to understand the tools and techniques used in the industry and provide the necessary foundations for inculcating innovative approaches.

UNIT-I:

Crystallography, Crystal Structures & Band Theory of Solids:

Crystallography & Crystal Structures: Crystal planes & crystal directions, Miller indices, Inter-planar spacing of orthogonal crystal systems. Atomic radius, Co-ordination number and packing fraction of S.C.C., B.C.C & F.C.C., Crystal structure of diamond.

Band theory of solids: Schrodinger time independent wave equation and significance of wave function. Electrons in a periodic potential, Bloch theorem, Kronig-Penny model (Qualitative treatment), E-k curve, Origin of band formation in solids, Classification of materials into conductors, semi conductors and insulators.

UNIT-II:

Semi-conductor Physics & Semi-conductor Devices.

Semi-conductor Physics: Calculation of carrier concentration in intrinsic semiconductors and extrinsic semi conductors (N-type), Direct and Indirect band gap semi conductors, Hall effect & its applications.

Semi-conductor devices: Energy diagram of P-N diode, I-V characteristics of P-N junction diode, LED, photo diode & solar cell.

UNIT-III:

Dielectrics & Magnetic Materials

Dielectrics: Electric dipoles, Dipole moment, Polarizability, Electric susceptibility, Displacement vector, Electronic, ionic and orientational polarizations and calculations of electronic and ionic polarizabilities, Internal fields in solids, Piezo-electricity, Ferro electricity & Pyro electricity (elements only).

Magnetic materials: Origin of magnetic moment, Bohr magneton, Classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Hysteresis curve, Soft and hard magnetic materials , Properties of anti-ferro and ferri magnetic materials and their applications in engineering.

UNIT-IV:

Lasers & Fibre Optics

Lasers: Characteristics of lasers, Spontaneous and stimulated emission of radiation, Einstein's coefficients (qualitative treatment), Population inversion, Lasing action. Semi conductor diode laser (homo-junction), Applications of lasers in engineering and medicine.

Fibre Optics: Acceptance angle and acceptance cone, Numerical aperture, Step index and graded index fibres, Applications of optical fibres in communication systems.

UNIT-V:

Super-conductivity & Nano Science

Super-conductivity: Zero resistance, Critical temperature, Perfect dia-magnetism, Meissner effect, Critical field (H_c), Type-I & Type -II super conductors, Applications of super conducting magnets.

Nano Science: Nano scale, Surface to volume ratio, Quantum confinement, Top-down method: Bottom-up fabrication, sol-gel method, chemical vapour deposition method, Characterization by SEM (Principles) - Applications.

Course Outcomes:

1. The student learns about crystalline materials and their structures.
2. The student learns about classification of solids by band theory.
3. The student learns how to calculate number of charge carriers in a semi conductor.
4. The student learns about fabrication of semi conductors into devices.
5. The student learns about dielectrics and magnetic materials along with their engineering applications.
6. The student learns about lasers, their construction and applications in engineering field.
7. The student learns about super conductors, classifications and their applications.
8. The student learns about nano materials and their fabrication methods along with their characterisation by XRD & SEM.

Recommended Text Bbooks:

1. Engineering Physics, P.K Palanisamy, Scitech Publications
2. Engineering Physics, V. Rajandran, Tat Mc. Graw Hill Book Publishers.
3. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar, S. Chand & Co. (for acoustics).
4. Applied Physics for Engineers – P. Madhusudana Rao, Academic Publishing Company, 2013.

Reference Books:

1. Solid State Physics – M.Armugam, Anuradha Publications.
2. Modern Physics – R. Murugeshan & K. Siva Prasath, S. Chand & Co. (for Statistical Mechnaics).
3. Introduction to Solid State Physics, C. Kittel (Wiley Eastern).
4. Solid State Physics, A.J. Dekker (Macmillan).
5. Applied Physics, Mani Naidu Pearson Edition.
6. Engineering Physics, K. Vijay Kumar, T. Sreekanth, S. Chand Publications.
7. Engineering Physics, D.K. Bhattacharya, Poonam Tandon, Oxford University Press

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9302) ENGINEERING MECHANICS-II

I-Year II-Sem: Civil, Mech

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

1. Determine the internal forces in plane trusses.
2. Know the applications of trusses to cantilever and simply supported trusses.
3. Describe the motion of a particle in terms of its position, velocity and acceleration in different frames of references.
4. Apply work, energy, relationships for a particle in motion.
5. Apply impulse and momentum relationships for a particle in motion.
6. Describe the motion of a rigid body in different frames of reference.

UNIT-I

ANALYSIS OF PERFECT FRAMES: Analytical Method-Types of frames-Assumption for forces in members of a perfect frame. Method of Joints, Method of sections, Force Table, Cantilever Trusses, Structure with one end hinged & other freely supported on rollers carrying Horizontal & inclined loads.

UNIT-II

KINEMATICS OF A PARTICLE: Motion of a particle – Rectilinear motion – motion curves – Rectangular components of curvilinear motion– Kinematics of Rigid Body - Types of rigid body motion -Angular motion - Fixed Axis Rotation.

UNIT-III

KINETICS OF A PARTICLES: Translation -Analysis as a Particle and Analysis as a Rigid Body in Translation – Equations of plane motion - Angular motion - Fixed Axis Rotation – Rolling Bodies.

UNIT-IV

WORK – ENERGY METHOD: Work energy Equations for Translation - Work-Energy Applications to Particle Motion – Work energy applied to Connected Systems - Work energy applied to Fixed Axis Rotation and Plane Motion. Impulse and momentum.

UNIT-V

Mechanical Vibrations : Definitions and Concepts – Simple Harmonic Motion – Free vibrations, simple and Compound Pendulums – Torsion Pendulum – Free vibrations without damping: General cases.

TEXT BOOKS:

1. Engg. Mechanics / S.S. Bhavikatti & K.G. Rajasekharappa / Third edition /New age International Publishers
2. Engineering Mechanics - Statics and Dynamics by Ferdinand.L. Singer / Harper International Edition.

3. Engineering Mechanics/ S. Timoshenko and D.H. Young / Mc Graw Hill Book Company.

REFERENCES:

1. Engineering Mechanics / Irving Shames / Prentice Hall
2. Engg. Mechanics / M.V. Seshagiri Rao & D Rama Durgaiah/ Universities Press
3. Engineering Mechanics, Umesh Regl / Tayal.
4. Engg. Mechanics / KL Kumar / Tata McGraw Hill.

COURSE OUTCOMES:

The students will be able to

1. Apply engineering science principles to develop algebraic relationships among key physical parameters and variables based on analysis of a specified system
2. Apply the principles of mechanics for solving practical problems related to equilibrium of rigid bodies and particle in motion.
3. Use references that provide tabulated physical data that are useful for mechanical engineers.
4. Deal the subjects like Mechanics of Solids, Mechanics of Fluids and Design of machines etc. in higher classes with an ease.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9305) ENGINEERING GRAPHICS –II

I Year II–Sem: Mechanical, Civil

L	T	P	C
2	0	4	4

COURSE OBJECSTIVES:
1. Development of Surfaces is most useful of real time applications of in industry.
2. Gain knowledge of inter sections of solids and their usage in real time applications.
3. Attain the concepts of isometric, orthographic projections.

UNIT – I
DEVELOPMENT OF SURFACES: Development of Surfaces of Right, Regular Solids – Prisms, Cylinder, Pyramids, cone and their parts. Frustum of solids.

UNIT – II
INTERSECTION OF SOLIDS:- Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT – III
ISOMETRIC PROJECTIONS: Principles of isometric Projection – Isometric Scale – Isometric Views – conventions –Isometric views of lines, Plane Figure, Simple and Compound Solids – Isometric Projection of objects having non – isometric lines, isometric projection of Spherical Parts.

UNIT – IV
TRANSFORMATION OF PROJECTIONS: Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views to isometric views – simple objects.

UNIT – V
PERSPECTIVE PROJECTIONS: Perspective View: Points, Lines and Plane Figure, Vanishing Point Methods (General Method only).

TEXT BOOKS
1. Engineering Drawing – Besant, Agrawal, TMH
2. Engineering Drawing. N.D.Bhatt

REFRENCES:

1. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
2. Engineering drawing – P.J.Shan S.Chand Publihers.
3. Engineering Drawing – Johle/Tata Macgraw Hill Book Publishers.
4. Engineering Drawing – M.B.Shah and B.C.Rana, pearson.
5. Engineering Drawing by K.Venu Gopal & V.Prabu Raja New Age publications.
6. Engineering Drawing by John. PHL Learning Publisher.

COURSE OUTCOMES:

1. Understand the development of surfaces.
2. Understand the intersection of solids and their applications.
3. Understand the isometric and orthographic projections and to understand the applications of these ideas in fabrication of machine parts.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9508) OBJECT ORIENTED PROGRMMING & DATA STRUCTURES

I Year II-Sem: Civil & Mech	L/T/P	C
	3/0/0	3

Objectives:

To provide a comprehensive working knowledge on the object oriented language C++ and to implement abstract data types, linear and nonlinear data structures for problem solving. To provide a foundation on generic programming based on over loading concepts, inheritance and virtuality. To inculcate ability to grasp the behaviour of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving. To provide a working knowledge on searching and sorting techniques and to write programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

Syllabus Content

UNIT-1

C++ Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling. Function Over Loading, Operator Overloading,

UNIT-2

Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT-3

Basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++. Linked list operations insertion, deletion and searching. Hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

UNIT-4

Search Trees: Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations _ Insertion, Deletion and Searching. Trees definitions, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching.

UNIT-5

Graphs: Basic terminology, representations of graphs, graph search methods DFS, BFS, Suffix tries.

Text Books:

1. *Object oriented programming with C++, E. Balagurusamy,* Cengage Learning ,Tata McGraw Hill Education ,3rd Edition.
2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
3. Classic Data structures by Samantha, PHI Learning Pvt.Ltd,2nd Edition.

References:

1. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek,Cengage Learning.
4. Data Structures Using C++, D.s. Malik,Cengage Learning, India Edition.
5. Mastering Algorithms with C,K.Loudon,O'Reilly,SPD PVT.Ltd.
6. An introduction to Data structures and algorithms, J.A.Storer,Springer.
7. *Data Structures: A Pseudocode Approach with C++,* Richard F Gilberg, Behrouz A Forouzan, Cengage Learning
8. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.

CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.

CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.

CO-4: An ability to communicate effectively, both in writing and oral.

CO-5: A recognition of the need for, and an ability to engage in life-long learning.

Learning Outcomes:

1. Understanding of fundamental concepts of abstract data types and general standard data structures.
2. Ability to design linear data structures stacks, queues and linked lists.
3. Ability to design nonlinear data structures, trees and graphs, and to implement their operations.
4. Ability to implement different searching and sorting techniques.
5. Ability to apply different searching and sorting techniques for real world problems..

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9307) ENGINEERING WORKSHOP/IT WORKSHOP

I Year I-Sem EEE
I Year II-Sem Civil, Mechanical, ECE

L	T	P	C
0	0	3	2

COURSE OBJECSTIVES:
1. Know the usage of various tools and their application in carpentry, tin smithy.
2. Know the usage of various tools and their application in black smithy, foundry, welding and house wiring.
3. Make lap joint and dove tail joint in carpentry.
4. Make scoop, funnel and tray like items in tin smithy.
5. Use one – way, two-way switches, parallel and series connections in house wiring.
6. Know the basics of welding.

UNIT – I

TRADES FOR EXERCISES: (Any six trades from the following for Mechanical Engineering Branch & Any four trades for all other Branches with minimum of two exercises in each trade)
1. Carpentry
2. Fitting
3. Tin – Smithy
4. Black Smithy
5. House – wiring
6. Foundry
7. Plumbing
8. Soldering

UNIT - II

TRADES FOR DEMONSTRATION & EXPOSURE
1. Demonstration of Power tools & wiring
2. Welding.
3. Machine Shop

UNIT – III

IT WORKSHOP I: Computer hardware, identification of parts, Disassembly, Assembly of computer to working condition, simple diagnostic exercises.

IT WORKSHOP II: Installation of operating system windows and Linux simple diagnostic exercises.

TEXTBOOKS:

1. Workshop Manual – P.Kannaiah / K.L.Narayana/Scitech Publishers.
2. Workshop Manual – Venkat Reddy/BS Publication / 6th Edition.

COURSE OUTCOMES:

The students will be able to

1. Know the fundamental knowledge of various trades and their usage in real time applications.
2. Gain knowledge of Foundry, Welding, Black smithy, Fitting, Machine shop and house wiring.
3. Understand the basis for analyzing power tools in construction and wood working, electrical engineering and mechanical engineering.
4. Use basic concepts of computer hardware for assembly and disassembly.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9010) ENGINEERING PHYSICS LAB

I Year B. Tech. II-Sem : CIVIL & MECH

L	T	P	C
0	0	3	2

Objectives:

The purpose of doing the experiments in laboratory is not simply to verify a principle but also to explore the other related phenomena and to find their applicability. The students are suggested to work in this direction and get benefit out of it.

1. To get practical knowledge which is related to the engineering course in the development of new technologies.
2. To impart fundamental knowledge in handling the equipment in Physics laboratory.
3. To offer practical experience on the basic equipment related to engineering Physics.
4. For practical understanding of the theoretical concepts of Physics.
5. To develop inquisitiveness in handling physics equipment leading to new technologies.

S. No. Name of the Experiment

1. Study of LED and LASER diode characteristics.
2. Torsional Pendulum-determination of rigidity modulus of material of a wire.
3. Determination of energy gap of material of p-n junction.
4. Bending losses of optical fibres and evaluation of numerical aperture of a given optical fibre.
5. Study of Decay of charge & determination of time constant of an RC circuit.
6. Determination of resonant frequency and quality factor of LCR circuit.
7. Study of Characteristics of solar cell.
8. Determination of wavelength of Laser source – Diffraction grating.
9. Determination of frequency of AC supply-sonometer.
10. Determination of wavelength of monochromatic source using diffraction grating.

Laboratory Manual:

The Laboratory manual of Engineering Physics by Dr. Y. Aparna & Dr. K. Venkateshwar Rao, VGS Publications

Course Outcomes:

- The laboratory course helps the student how to operate different equipments related to engineering. It also allows the student to develop experimental skills to design new experiments in engineering.
- The course enlightens the student about modern equipment like solar cell, optical fibre etc.,
- With the exposure to these experiments, the student can compare the theory and correlate with experiment.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9509) OBJECT ORIENTED PROGRMMING & DATA STRUCTURES LAB

I Year II-Sem: Civil & Mech **L/T/P** **C**
0/0/3 **2**

Objectives:

To provide a comprehensive working knowledge on the object oriented language C++ and to provide implementation experience on abstract data types, linear and nonlinear data structures for problem solving. To provide a working knowledge on generic programming based on over loading concepts, inheritance and virtuality. To inculcate ability to grasp the behaviour of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving. To provide an application oriented working knowledge on searching and sorting techniques and to write programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

Syllabus Content

1. Write a C++ program to demonstrate class.
2. Write a C++ program on constructor.
3. Write a C++ program on inline functions.
4. Write a C++ program on this pointer.
5. Write a C++ program on function overloading.
6. Write a C++ program on operator overloading.
7. Write a C++ program that illustrates how run time polymorphism is achieved.
8. Write a C++ program on Multiple inheritance.
9. Write a C++ program to implement all the functions of a dictionary ADT.
10. Write a C++ program for single linked list operations.
11. Write a C++ program for hashing with quadratic programming.
12. C++ programs using class templates to implement the following using an array.
    a) Stack ADT b) Queue ADT
13. Write C++ programs using class templates to implement the following using a singly linked list.
    a) Stack ADT b) Queue ADT
14. Write C++ programs, using class templates, that use non-recursive functions to traverse the given binary tree in
    a) preorder b) inorder c) postorder.
15. Write C++ programs, using class templates, that use recursive functions to traverse the given binary tree in
    a) preorder b) inorder c) postorder.
16. Write a C++ program using class templates to perform the following operations:
    a) Insert an element into a binary search tree.
    b) Delete an element from a binary search tree.
    c) Search for a key element in a binary search tree.
17. Write C++ programs using class templates for the implementation of bfs and dfs for a given graph.

Text Books:

1. *Object oriented programming with C++, E. Balagurusamy,* Cengage Learning ,Tata McGraw Hill Education ,3rd Edition.
2. Data structures a pseudo code approach with c++, Indian edition, R.F.Gilberg and B.A.Forouzan Cengage Learning.
3. Programming Prinicples and Practice using C++, B.Stroustrup, Addition-Wiesly (Pearson Education)
4. Data Structures and STL,W.J.Collins,mc Graw Hill,Internationational Edition.
5. Data Structures and Algorithms with OODesign patterns in C++,B.R.Priess,John Wiley &sons.
6. The Art,Philosophy and Science of OOP with C++,Rick Miller,SPD.
7. C++ for Programmers ,P.J.Deitel and H.M.Deitel,PHI/Pearson.

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
CO-4: An ability to communicate effectively, both in writing and oral.
CO-5: A recognition of the need for, and an ability to engage in life-long learning.

Learning Outcomes:

1. Understanding of fundamental concepts of abstract data types and general standard data structures.
2. Ability to design linear data structures stacks, queues and linked lists.
3. Ability to design nonlinear data structures, trees and graphs, and to implement their operations.
4. Ability to implement different searching and sorting techniques.
5. Ability to apply different searching and sorting techniques for real world problems..

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9005) PROBABILITY & STATISTICS

II Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites: None
Course Objective:

The main purpose of teaching Probability and Statistics is to develop the knowledge of the student. In the syllabus we concentrate on a few carefully selected basic ideas of general practical importance which are especially suitable for teaching the students probability and statistics to think and develop his own creative ability to solve engineering problem.

UNIT-I: Probability
Sample space and events – Probability – The axioms of probability – Some Elementary theorems – Conditional probability – Baye's theorem.

UNIT-II: Single Random Variables and Probability Distributions.
Random variables – Discrete and continuous. Probability distributions, mass function/ density function of a probability distributions.
Distributions: Binomial, Poisson and Normal distribution and their properties.

UNIT-III: Correlation & Regression
Covariance of two random variables, Correlation:- Coefficient of correlation, The rank correlation.
Regression: Regression Coefficient, The lines of regression.

UNIT-IV: Testing of Hypothesis and Large Sample Test
Testing of hypothesis: Null hypothesis, Alternate hypothesis, type I, & type II errors – critical region, confidence interval, Level of significance. One sided test, Two sided test.

Large sample tests:
(i) Test of Equality of means of two samples equality of sample mean and population mean (cases of known variance & unknown variance, equal and unequal variances)
(ii) Tests of significance of difference between sample S.D and population S.D.
(iii) Tests of significance difference between sample proportion and population proportion & difference between two sample proportions.

UNIT – V: Testing of Hypothesis and Small Sample Test
Small sample tests:
Student t-distribution, its properties; Test of significance difference between sample mean and population mean; difference between means of two small samples.
Snedecor's F- distribution and its properties. Test of equality of two population variences
Chi-square distribution, its properties, Chi-square test of goodness of fit

Text Books:

1) FUNDAMENTALS OF MATHEMATICAL STATISTICS BY S C GUPTA AND V.K.KAPOOR (CHAPTERS IV&V)
2) PROBABILITY AND STATISTICS FOR ENGINEERS AND SCIENTISTS BY SHELDON M.ROSS,ACADEMIC PRESS
3) PROBABILITY AND STATISTICS FOR ENGINEERING AND THE SCIENCEC BY JAY L.DEVORE.

References:

1) MATHEMATICS FOR ENGINEERS SERIES –PROBABILITY STATISTICS AND STOCHASTIC PROCESS BY K.B.DATTA AND M.A S.SRINIVAS,CENGAGE PUBLICATIONS
2) PROBABILITY, STATISTICS AND STOCHASTIC PROCESS BY PROF.A R K PRASAD., WIELY INDIA
3) PROBABILITY AND STATISTICS BY T.K.V.IYENGAR &B.KRISHNA GANDHI
4) A TEXT BOOK OF PROBABILITY AND STATISTICS, SHAHNAZ BATHUL , CENGAGE LEARNING

Course Outcomes:

By studying the Probability & Statistics students are able to describes randomness or an uncertainty in certain realistic situations it can be of either discrete or continuous functions and the study of binomial, and the Poisson and normal random variables for the continuous case predominantly describe important probability distributions. Important statistical properties for this random variables provide very good insight and essential for Industrial applications. By studying the queuing theory students are able to solve the real world problems of queuing systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9101) STRENGTH OF MATERIALS-I

II Year B.Tech. Civil Engg. I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: Engineering Mechanics-I

Course Objectives:

- Behavior of bodies subjected to various types of stresses and the associated strains
- Shear force and bending moment for determinate beams
- Bending and shear stresses for beams in flexure
- Apply the concept of pure torsion and different types of spring

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 modulii and the relationship between them-Bars of varying section-composite bars-Temperature stresses. Elastic Constants.

STRAIN ENERGY: Resilience-Gradual, Sudden, impact and shock loading-Simple Applications

UNIT-II

SHEAR FORCE AND BENDING MOMENT: Definition of beam, Types of supports, Classification of beams, Concept of shear force and bending moment, Shear force diagram and Bending moment diagram for simply supported, Cantilever and overhanging beams subjected to point load, uniformly distributed load, uniformly varying loads and combination of these loads, point of contra flexure-Relation between S.F and B.M and rate of loading at a section of beam.

UNIT-III

FLEXURAL STRESSES: Assumptions, Theory of simple bending, Derivation of bending equation, Application of bending equation and calculation of bending stresses in beams of homogeneous and fletched beam material, Beams of Uniform strength.

SHEAR STRESSES: Shearing stress due to bending, Variation of flexural shears stress distribution across various shapes of beams (rectangle, circular, triangular ,I,T angle section), Shear resilience.

UNIT-IV

TORSION OF CIRCULAR SHAFTS: Theory of pure torsion in solid and hollow circular shafts, Derivation of torsion equation, assumption made in the theory of torsion, polar section modulus, combined bending and torsion and end thrust, Shear stresses, angle of twist, Power transmitted by shaft.

SPRINGS: Introduction of springs, types of springs **,**Close-coiled and open-coiled helical spring subjected to axial load and axial twist, Springs in series, Springs in parallel, Strain energy in springs-carriage or leaf spring.

UNIT- V

PRINCIPAL STRESSES AND STRAINS: Definition, Normal and Shear stress, Stresses on an inclined section of a bar under axial loading-compound stresses-two perpendicular normal stresses accompanied by a state of simple shear, Principal stresses and their graphical representation by Mohr's circle, Analytical and graphical solution.

THEORIES OF FAILURE: Introduction-Various theories of failure- Maximum principal stress theory, Maximum principal strain theory, Maximum shear stress theory, Strain energy theory and Shear strain energy theory (Von Mises Theory)

Text Books:

1. Timoshenko and Gere, "*Mechanics of Materials*", *PWS* Publishing Company, Boston, 4th edn., 1997.
2. H.J.Shah and S.B. Junnarkar, "*Mechanics of Structures Vol.-I. and Vol.-II*", Charotar Publishing House Pvt. Ltd., Anand, 31st edn., 2014.

Reference Books:

1. Andrew Pytel and Ferdinand L. Singer, "*Strength of Materials*", Harper and Row Publishers, New York, 4th edn., 2011.
2. Ferdinand P Beer et al., "*Mechanics of Materials*", Tata McGraw Hill Education Pvt. Ltd

Course Outcomes:

- Explicate the various types of stresses and the associated strains
- Compute the Shear force and bending moment for determinate beams
- Assess the Bending and shear stresses for beams in flexure
- Explore the behavior of springs and circular shafts subjected to loading

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9203) BASIC ELECTRICAL & ELECTRONICS ENGINEERING

II Year B.Tech I SEM, Civil | **L T/P/D/C**
3 1/ 0/ 0/3

Pre Requisites: None

Course Objectives:

This course introduces the concepts of basis electrical engineering parameters, quantities, analysis of AC and DC circuits, the construction operation and analysis of transformers, DC and AC machines. It also gives knowledge about operation of diode and transistor, characteristics and its applications.

UNIT- I

Electrical Circuits: Circuits concept, R-L-C Parameters, Voltage and Current sources, Source Transformation, V–I relationship for Passive elements, Kirchoff's Laws, Network reduction techniques – series, parallel, series parallel, star-delta & star-delta transformations, Nodal Analysis, Mesh analysis with DC excitations.

Network Theorems - Thevenin's, Norton's, Maximum Power Transfer, Superposition, Reciprocity Theorems with DC excitation.

UNIT- II

Single Phase AC Circuits - R.M.S. and Average values, Form Factor, steady state analysis of series, Parallel and Series parallel Combinations of R, L and C with Sinusoidal excitation, concept of reactance, Impedance, Susceptance and Admittance – phase and phase difference, Concept of Power Factor, j-notation, complex and Polar forms of representation.

Three Phase AC Circuits: Production of 3 -ϕ Voltages, Voltage & Current relationships of Line and Phase values for Star and Delta connections.

UNIT- III

D.C.Machines: Constructional features, Methods of Excitation, E.M.F. Equation and Applications, Torque development in D.C motor, Characteristics of DC motors, losses, Efficiency, Swinburne's test, Speed control of DC Shunt motors

Single Phase Transformers: Construction and principle of operation, Development of No Load & On Load Phasor diagrams (Basic fundamentals only)

3-Phase Induction Motor: Constructional features, Principle of Operation (Basic fundamentals only)

UNIT- IV

P-N Junction Diode - Diode equation, Energy Band diagram, V-I characteristic, Temperature dependence, Ideal versus practical, Static and dynamic resistances, Equivalent circuit.

Rectifiers and Filters - The P-N junction as a rectifier - A Half Wave Rectifier, Ripple Factor, Full Wave Rectifier, Bridge Rectifier, Filters – Inductor Filters, Capacitor Filters, L-section Filters, π- section Filters.

UNIT- V

Bipolar Junction Transistor (BJT) - Construction, Principle of Operation, CB, CE and CC configurations.

Junction Field Effect Transistor - Construction, Principle of Operation, V-I Characteristic, Comparison of BJT and FET,

Zener Diode and SCR Devices- Zener diode characteristics, Use of Zener diode as simple regulator, Breakdown Mechanisms in Zener diode, Principle of Operation of SCR.(Basic fundamentals only)

Text Books:

1. Electronic Devices and Circuits – R.L. Boylston and Louis Nashelsky, PEI/PHI, 9th Ed, 2006.
2. Engineering circuit analysis- by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th edition.
3. Electrical Machines – by P.S.Bimbra

References:

1. Introduction to Electronic Devices and Circuits-Rober T. Paynter, Pearson Education.
2. Electronic Devices and Circuits - K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.
3. Electrical Machines – by J.B.Gupta.
4. Network Theory by N.C.Jagan & C.Lakshminarayana, B.S. Publications.
5. Network Theory by Sudhakar, Shyam Mohan Palli, TMH.

Course Outcomes:

After going through this course the student gets a thorough knowledge on basic electrical circuits, parameters, and operation of the transformers in the energy conversion process, electromechanical energy conversion, construction operation characteristics of DC machines and the constructional features and also fundamental and characteristics of diode and transistor. With which he/she can able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9102) SURVEYING

II Year B.Tech. Civil Engg. I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: None

Course Objectives:

- Concepts of surveying using chain, compass & plane table
- Concepts of meridian, bearings inter: relationships
- Principles of Leveling, Methods of spirit leveling & plotting contours maps by various methods
- Give introduction to advance methods of surveying

UNIT-I

INTRODUCTION: Overview of plane Surveying(chain, compass and plane table), Objectives, Principles, Classification ,Scales and Symbols, signals

DISTANCES AND DIRECTION: Distance measurement method; use of chain, tape and electronic distance measurements, meridians, azimuths and bearings, declination, computation of angle.

UNIT-II

LEVELLING and CONTOURING: Concept and Terminology, Temporary adjustments-method of leveling.

Characteristics and uses of contours –Method of conducting contour survey and their Plotting

UNIT-III

COMPUTATION OF AREAS AND VOLUMES: Area from Field Notes, Computation of areas along irregular boundaries and area consisting of regular boundaries. Embankments and cutting for a level section and two level sections with and without transverse slopes, determination of the capacity of the reservoir, Volume of barrow pits.

UNIT-IV

THEODOLITE: Theodolite ,Description ,uses and adjustments - Temporary and Permanent, Measurement of Horizontal and Vertical angles .Principles of electronic Theodolite. Trigonometrical Levelling ,Traversing.

UNIT-V

TACHEOMETRIC SURVEYING : Stadia & Tangential Methods of Tacheometry .Distance and Elevation Formula for Staff Vertical position. **Curves:** Types of Curves, Design and setting out- Simple and Compound Curves.

INTRODUCTION TO ADVANCED SURVEYING:

Total station and Global Positioning System .Introduction to Geographic Information System (GIS)

Text Books:

1. B.C. Punmia & Ashok kumar Jain, "*Surveying Volume I and II*", Laxmi Publications, 16th edn., 2011.
2. S.K. Duggal, "*Surveying Volume1 and II*", McGraw Hill Education (India) Pvt.Ltd, 2015.

Reference Books:

1. Dr. K.R. Arora, "*Surveying Volume I and II*", Standard Book House, 15th edn., 2015.
2. T.P. Kanetker and S.V. Kulkarni, "*Surveying and Leveling Volume I and II*", , 24th edn., 2014.
3. R. Subramanian, "*Surveying and Leveling*", Oxford University Press, New Delhi, 2nd edn., 2007.
4. S.K.Roy, "*Fundamentals of Surveying*", PHI Learning Private Limited, New Delhi, 2nd edn., 2010.

Course Outcomes :

- Describe the concepts of surveying
- Apprise compass and theodolite surveying
- Describe the concepts of leveling and its methods& discuss different methods to plot contour maps
- Describe the new and advance methods of surveying

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9103) FLUID MECHANICS

II Year B.Tech. Civil Engg. I-Sem

L	T	P	C
4	0	0	4

Pre Requisites: Engineering Mechanics-I

Course Objectives

- Identify and obtain values of fluid properties and relationship between them.
- Understand the principles of continuity, momentum, and energy as applied to fluid motions.
- Recognize these principles written in form of mathematical equations.
- Apply these equations to analyze problems by making good assumptions and learn systematic engineering method to solve practical fluid mechanics problems.

UNIT-I

INTRODUCTION : Dimensions and units – Physical properties of fluids specific gravity, viscosity, surface tension, vapor pressure and their influences on fluid motionpressure at a point, Pascal's law, Hydrostatic law - atmospheric, gauge and vacuum pressure- measurement of pressure. Pressure gauges, Manometers: differential and Micro Manometers. Hydrostatic forces on submerged plane, Horizontal, Vertical, inclined and curved surfaces – Center of pressure. Derivations and problems.

UNTI – II

FLUID KINEMATICS : Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows : Steady, unsteady, uniform, nonuniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows – stream and velocity potential functions, flownet analysis.

UNIT – III

FLUID DYNAMICS AND MEASUREMENT OF FLOW: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, (Navier – stokes equations (Explanationary) 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

UNIT - IV

CLOSED CONDUIT FLOW: Reynold's experiment – Characteristics of Laminar & Turbulent flows. Laws of Fluid friction – Darcy's equation, ,variation of friction factor with Reynold'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.

UNIT – V

NAVIER STOKE'S EQUATIONS AND BOUNDARY LAYER THEORY: Approximate Solutions of Navier Stoke's Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Vonkarmen 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. F M White. "Fluid Mechanics", Tata McGraw Hill Publication 2011.
2. Victor L. Streeter and E. Benjamin Wylie, "Fluid Mechanics", Mc.Grawhill publishers Pvt. Ltd, 1985.
3. K.L.Kumar, "Engineering Fluid Mechanics", S.Chand & Co., 2010.
4. Modi and Seth, "Fluid Mechanics", Standard book house, 2002.

References:

1. J.F.Douglas, J.M. Gaserek and J.A.Swaffirld, " Fluid Mechanics", PHI, 2011.
2. S.K.Som & G.Biswas, "Introduction to Fluid Mechanics", Tata Mc.Grawhill publishers Pvt. Ltd., 2003.
3. A.K. Mohanty, "Fluid Mehanics", Prentice Hall of India Pvt. Ltd., New Delhi, 1994.
4. Edward J. Shaughnessy, Jr, Ira M. Katz and James P. Schaffer, "Introduction to Fluid Mechanics", Oxford University Press, New Delhi. 2005.
5. James A Fay. "Introduction to Fluid Mechanics", PHI, 1994.

Course Outcomes

- Apply fundamental knowledge of mathematics to modeling and analysis of fluid flow problems in civil and environmental engineering.
- Conduct experiments (in teams) in pipe flows and open-channel flows and interpreting data from model studies to prototype cases, as well as documenting them in engineering reports.
- Understand or become aware of disasters caused by an incorrect analysis in hydraulic engineering system.
- Apply fundamental principles of fluid mechanics for the solution of practical civil engineering problems of water conveyance in pipes, orifices, mouth pieces, notches and weirs.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9104) STRENGTH OF MATERIALS LABORATORY

II Year B.Tech. Civil Engg. I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- Study the uses of various types of testing machines and capacities
- Test various materials against various types of straining actions for assessing the strength of materials
- Approximate analysis of tall structures subjected to horizontal loading
- Understand various implements to apply specific forces using the machine or to augment the utility of the same machine.

List of Experiments:

1. Tension test on mild steel & Tor steel
2. Bending test on cantilever beam
3. Bending test on simply supported beam
4. Torsion test
5. Rockwell hardness Test
6. Brinells hardness test
7. Spring Test
8. Compression test on wood or Concrete
9. Impact test
10. Shear Test

Course Outcomes:

- Clearly understand the concept of deciding the shape or type of specimen for assessing different strengths against various straining actions.
- Design the specimen for assessing a property of the material with the available machines.
- Understand the procedure for making use of various techniques of load measuring or deformation measuring instruments.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9105) SURVEYING LAB - I

II Year B.Tech. Civil Engg. I-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- Learn and understand the various basic concept and principles used in surveying like Chain Surveying, Compass surveying, Plane Table Surveying and Leveling.
- Learn and Understand various instruments used in surveying.
- Learn and Understand how to calculate area of plot and ground.
- Learn and Understand about Horizontal angle, Vertical Angle ,Horizontal distance and vertical distance to study the ground profile.

List of Exercises:

1. Survey of an area by chain survey (closed traverse) & plotting
2. Chaining across obstacles
3. Determination of distance between two inaccessible points with compass.
4. Surveying of a given area by prismatic compass (closed traverse) and plotting after adjustment.
5. Radiation method, intersection method by plane table survey
6. Two point and three point problems in plane table survey
7. Traversing by plane table survey
8. Fly leveling (differential leveling)
9. An exercise of L.S and C.S and plotting of road works.
10. Two exercises on contouring.

Course Outcomes:

- Prepare map and plan for required site with suitable scale
- Prepare contour map and estimate the quantity of earthwork required for formation level for road and railway alignment.
- Judge which type of instrument to be used for carrying out survey for a particular area and estimate the area
- Judge the profile of ground by observing the available existing map.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9204) BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

II Year B.Tech. I-Sem, Civil

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objective:

1. To learn concepts of law of conservation of energy and its application by Kirchhoff's Laws
2. To simplify complex network & to identify optimum loading conditions.
3. To analysis the performance of DC machine.
4. To Analysis nature of semi conductor devices & its performance.
5. To analysis the operation of rectifiers.

List of Experiments:

1. Verification of Kirchhoff's Laws.
2. Verification of superposition and Reciprocity Theorems.
3. Verification of Maximum Power transfer theorem.
4. Verification of Thevenin's theorem.
5. Magnetization characteristics of DC Shunt Generator.
6. Swinburne's Test on DC shunt machine.
7. Brake test on DC shunt motor.
8. OC & SC tests on single phaseTtransformer.
9. PN Junction Diode characteristics (Forward bias & Reverse bias).
10. Zener Diode Characteristics.
11. Transistor CE Characteristics (Input and Output)
12. Rectifier without filters (Full wave & Half wave)
13. Rectifier with filters (Full wave & Half wave)

Course Outcomes:

1. Easier solutions for the complex Electrical & Electronic Circuits.
2. Identify the optimum loading on the system.
3. Identify the performance of machines.
4. Identify the performance and operating nature of semi conductors.
5. Describing the performance of rectifier.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9022) HUMAN VALUES AND PROFESSIONAL ETHICS

II Year B.Tech. I-Sem, Civil

L	T	P	C
2	0	0	0

Pre Requisites: None

Course Objectives:
This course introduces the professional and ethical responsibilities of engineers in the civilized society and makes them aware of the various legal and rights issues and the regulatory mechanisms in the public.

Unit-I
Human Values: Morals, values, ethics – integrity – work ethics –service learning – civic virtue – respect for others- living peacefully - Caring –sharing –honesty – courage – valuing time – cooperation – commitment –empathy – self-confidence –spirituality – character- Mini-Cases

Unit-II
Professional Ethics: Profession- and professionalism - Two models of professionalism – Professional etiquette -Three types of Ethics or morality Responsibility in Engineering – Engineering standards –Engineering Ethics – Positive and Negative Faces. Professional Codes and Code of conduct (as given by ASME, ASCE, IEEE, IETE, Institute of Engineers as Guidelines for ethical conduct).Mini-cases.

Unit-III
Professional Responsibilities: Ethical standards Vs Professional Conduct – Zero Tolerance for Culpable Mistakes – Hazards and Risks- Risk benefit analysis– congeniality, collegiality and loyalty. Respect for authority – conflicts of interest – occupational crime — Mini-Cases.

Unit-IV
Professional Rights: professional rights and employee rights communicating risk and public policy – Whistle blowing - collective bargaining. Professionals /engineers as managers, advisors, experts, witnesses and consultants – moral leadership- Regulatory compliances, Monitoring and control- Mini-Cases

Unit-V
Ethics in global context: Global issues in MNCs- Problems of bribery, extortion, and grease payments – Problem of nepotism, excessive gifts – paternalism – different business practices – negotiating taxes. Mini-Cases.

Mini-projects :

Project 1: The student of this course should invariably attend (or watch on internet/any TV channel/YouTube/social media) two speeches of 30 minutes duration each dealing with spiritual discourse and submit a report on the contents of the lecture proceedings.

Project 2: Visit any organization (including shops/ hotels or shopping malls in your region) of your choice and observe how the professionals perform the given job with a focus on professional ethics and human values.

References

1. Aryasri, Human Values and Professional Ethics, Maruthi Publications.
2. S B George, Human Values and Professional Ethics, Vikas Publishing.
3. KR Govindan&SaenthilKumar:Professional Ethics and Human Values, Anuradha Publications.
4. S K Chakraborthy&D.Chakraborthy: Human Values and Ethics, Himalaya.
5. M. Govindarajan, S. Natarajan, & V.S. Senthilkumar: Engineering Ethics(Includes Human Values), HI Learning Pvt. Ltd., New Delhi – 110001

Course Outcomes:

1. The students will be aware of characteristics needed for purposeful professional life with values.
2. The students will be able to practice and demonstrate ethical standards in professional life.
3. The students will be able to understand group working and responsibilities.
4. The students will be able to understand and respect the rights of others and regulatory mechanisms in the world.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9106) BUILDING MATERIALS, CONSTRUCTION& PLANNING

II Year B.Tech. Civil Engg. II-Sem	L	T	P	C
	3	0	0	3

Pre Requisites: None

Course Objectives:

- Occurrence and existence of stone and preparation of brick
- Classification of lime, composition of cement and properties of other building materials
- Functional requirements of building and building components
- Construction of masonry work, adopting suitable temporary supporting system

UNIT-I

INTRODUCTION: Identification of materials for Construction in Civil Engineering Practice, Physical and Mechanical properties of building Materials.

STONES: Classification of Stones, Properties of Stones, Characteristic of good building Stone, Tests on Stones.

BRICKS: Composition of good brick, Manufacturing process of bricks, Characteristic of good building bricks, Classification of bricks, Tests on Bricks.

UNIT-II

LIME: Source, Different types of Lime, Calcination of Lime, Properties of Lime, Tests on Limes.**CEMENT**: Raw Materials, Manufacturing Process, Types of Cement, Hydration of Cement, Properties of Cement, IS-Recommendation. **TIMBER:** Classification of trees, Seasoning of Timbers, Preservation of Timber, Industrial Timber, Defects in Timber.**CONCRETE**: Manufacturing Process of Cement Concrete, grade designation, Workability, Segregation, Bleeding. **MISCELLANIOUS**: GI/Fiber reinforced glass brick, Glass, Plastics, Asbestos, and Thermo coal, Flyash, Paints.

UNIT-III

BUILDING COMPONENTS:

WALLS: Types of Walls, Thickness of Walls, Cavity Wall. **OPENING IN BUILDINGS**: Doors and Windows, Types, Sizes and suitable for different location, Ventilators, lintels, Arches.

ROOFS: Flat Roof, Brief Description of RCC Roof, Madras Terrace and Jack arch Roof, Method of Construction. **VERTICAL TRANSPORTATION**: Types of Vertical Transportation in building, Staircase, Type of Staircases, Design of Staircase.

UNIT-IV

BUILDING PLANNING: Functional Planning of Buildings-Components of Buildings-IS/NBC Recommendations.

BUILDING SERVICES: Plumbing Services, Water distribution ,Sanitary lines and Fittings, Electricals services, Functional Requirements, System of Ventilations, Air-conditioned-Essential and Types, Acoustics, Characteristic absorption, Acoustic Design and Sound

Installation. Fire Protection,Fire Hazardous, Classification of Fire resistant materials and Constructions, Fire Protection Measures.

UNIT-V

BUILDING CONSTRUCTION:

MASONARY WORK: Stone Masonry, Dressing of Stones-Specification of stone masonary, Brick Masonry, Bond in Brick Masonry-Specification of Brick Masonry. RCC Brick – Specification of RCC Bricks.

TEMPERORY SUPPORTING STRUCTURE: Brief Description of Centring, Formwork, Scaffolding, Types of Scaffolding, Standard of Scaffolding, Shoring, Underpinning.

FINISHING WORK: Brief Description of Plastering, Pointing, White and Colour washing, Types of Wall Covering, False CEILING Work, Cladding, and Types of Tiles.

Text Books:

1. S.P Arora and Bindra, "*A Textbook of Building Construction*", Dhanpat Rai and Sons, 4th Edn., 2010.
2. Dr. B.C. Punmia, "*Building construction*", Laxmi Publications Pvt., Ltd, New Delhi, 19th Edn., 2005

Reference Books:

1. S.K. Duggal, "*Building materials*", New Age international Pvt. Ltd., New Delhi
2. S.V. Deodhar, "*Building science and planning*", Khanna Publishers, New Delhi.
3. N.L. Arora and B.L. Gupta, "*Building construction*", Satya prakshan publications, New Delhi.
4. C.Rangwala, K.S. Rangwala and P.S. Rangwala, "*Engineering materials"*, Charotar Publishers.
5. B.L.Thereja, A.K.Thereja, "*Electrical Technology Vol. I and II*"**,** S. Chand and Company Ltd, 2005.

Course Outcomes :

- Classify and demonstrate the occurrence and existence of stone and brick
- Describe the manufacturing of lime, cement and identify other materials suitable for building construction
- Frame and describe the building components and other statutory requirements
- Describe masonry work, finishing work, construction of RCC beams and columns

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9107) STRUCTURAL ANALYSIS – I

II Year B.Tech. Civil Engg. II-Sem

L	T	P	C
4	0	0	4

Pre Requisites: Engineering Mechanics-I and Strength of Materials-I

Course Objectives:

- Learn how to analyze the determinate and indeterminate structures.
- Understands the difference between two hinge and three hinged arches.
- Analyze the propped cantilever and fixed beam.
- Analyze the continuous beam using slope deflection and moment distribution method.

UNIT – I

ENERGY THEOREMS: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces - Castigliano's first theorem-Unit Load Method. Deflections of simple beams and pin- jointed plane trusses. Deflections of statically determinate bent frames.

UNIT – II

CABLES & SUSPENSION BRIDGES: Forces in loaded cables and hanging chains, cables with supports at different levels, Length of cable, different support conditions, Simple suspension bridges with two hinged and three hinged stiffening girders. BM and SF diagrams influence lines temperature effect on cables and stiffening girders.

UNIT – III

THREE HINGED ARCHES – Introduction – Types of Arches – Comparision between Three hinged and Two hinged Arches. Linear Arch. Eddy's theorem. Analysis of Three hinged arches. Normal Thrust and radial shear in an arch. Geometrical properties of parabolic and circular arch. Three hinged circular arch at different levels. Absolute maximum bending moment diagram for a three hinged arch.

TWO HINGED ARCHES: Introduction – Classification of Two hinged Arches – Analysis of two hinged parabolic arches – Secondary stresses in two hinged arches due to temperature and elastic shortening of rib.

UNIT-IV

PROPPED CANTILEVER and FIXED BEAMS: Determination of static and kinematic indeterminacies for beams- Analysis of Propped cantilever and fixed beams, including the beams with different moments of inertia, subjected to uniformly distributed load, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads - Shear force and Bending moment diagrams for Propped Cantilever and Fixed Beams-Deflection of Propped cantilever and fixed beams; effect of sinking of support, effect of rotation of a support.

UNIT – V

CONTINUOUS BEAMS: Introduction-Continuous beams. Clapeyron's theorem of three moments- Analysis of continuous beams with constant and variable moments of inertia with one or both ends fixed-continuous beams with overhang, effects of sinking of supports, Derivation of slope-deflection equation, application to continuous beams with and without settlement of supports, Analysis of continuous beams with and without settlement of supports using Moment Distribution Method. Shear force and Bending moment diagrams, Elastic curve.

Text Books:

1) V.N.Vazirani and M.M.Ratwani, "Structural Analysis Vol –I & II",Khanna Publishers, 2010.
2) G.S.Pandit and S.P.Gupta, "Structural Analysis Vol I & II", Tata McGraw Hill Education Pvt. Ltd., 2008.

References:

1) K.U.Muthu *et al.,* "Basic Structural Analysis", I.K.International Publishing House Pvt.Ltd., 2011.
2) by R.C.Hibbeler, "Structural Analysis", Pearson Education, 2008.
3) H.J.Shah and S.B.Junnarkar, "Mechanics of Structures Vol –II", Charotar Publishing House Pvt. Ltd., 2012.
4) Devdas Menon, "Structural Analysis", Narosa Publishing House, 2007.
5) C.S.Reddy., "Basic Structural Analysis", Tata McGraw Hill Education Pvt. Ltd., 2010.
6) M.L.Gamhir, "Fundamentals of Structural Analysis", PHI Learning Pvt. Ltd., 2011.
7) S.S.Bhavikatti, "Structural Analysis –I", Vikas Publishing House Pvt. Ltd., 2010.

Course Outcomes

- Judge which type of support is suitable for given conditions of loading.
- Understand the advantage of statically indeterminate structure over the statically determinate structure.
- Superimpose the effects of settlement or rotation of the supports over the regular analysis.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9108) STRENGTH OF MATERIALS–II

II Year B.Tech. Civil Engg. II-Sem

L	T	P	C
4	0	0	4

Pre Requisites: Strength of Materials-I

Course Objectives:

- Various methods to evaluate slope and deflection
- Stresses developed in short and long columns
- Analysis of statically indeterminate structures
- Stresses arise in thin and thick cylinders subjected to pressure

UNIT-I

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 method-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 – Conjugate beam method.

UNIT-II

DIRECT AND BENDING STRESSES: Stresses under the combined action of direct loading and bending moment, core of a section-determination of stresses in the case of chimneys, retaining walls and dams-condition of stability-stresses due to direct loading and bending moment about both axis.

COLUMNS AND STRUTS: Introduction –Types of columns- Euler's theory, Euler's critical load for columns with various end conditions, Limitations, Rankine's hypothesis, IS code formula, Critical load for eccentrically loaded columns, Empirical formulae-Straight line formula-Prof.Perry's formula.

UNIT-III

FIXED AND CONTINUOUS BEAMS: Analysis of fixed beams for shear and bending moments, Deflection of fixed beams, Effect of sinking of supports, Analysis of continuous beams using clapeyron's theorem of three moments, Effect of sinking of supports.

STATICALLY INDETERMINATE FRAMES: Analysis of statically indeterminate frames up to two degree of indeterminacy using Castigliano's theorem.

UNIT-IV

UNSYMETRICAL BENDING: Introduction-centroidal principle axes of section-Graphical method for locating principal axes-Moments of inertia referred to any set of rectangular axes-Stresses in beams subjected to unsymmetrical bending-principal axes-Resolution of bending moment into two rectangular axes through the centroid-Location of neutral axis-Deflection of beams in Unsymmetrical bending.

SHEAR CENTRE: Introduction –Shear centre for symmetrical and unsymmetrical (channel,I,T and L) sections.

UNIT-V

THIN CYLINDERS: The seamless cylindrical shells-Derivation and formula for longitudinal and circumferential stresses-hoop, longitudinal and volumetric strains-Changes in diameter and volume of thin cylinders-Thin spherical shells.

THICK CYLINDERS: Introduction lame's theory for thick cylinders-Derivation of lame's formulae-distribution of hoop and radial stresses across thickness-design of thick cylinders-compound cylinders-Necessary difference of radii for shrinkage-Thick spherical shells.

Text Books:

1. Timoshenko and Gere, "*Mechanics of Materials*", *PWS* Publishing Company, Boston, 4th edn., 1997.
2. H.J.Shah and S.B. Junnarkar, "*Mechanics of Structures Vol.-I. and Vol.-II*", Charotar Publishing House Pvt. Ltd., Anand, 31st edn., 2014.

Reference Books:

1. Andrew Pytel and Ferdinand L. Singer, "*Strength of Materials*", Harper and Row Publishers, New York, 4th edn., 2011.
2. Ferdinand P Beer et al., "*Mechanics of Materials*", Tata McGraw Hill Education Pvt. Ltd

Course Outcomes:

- Analyze slope and deflection in beams subjected to loading
- Evaluate the stresses in long and short columns with various loading and boundary conditions
- Apply principles of Clapeyron's and Castigliano theorem in analyzing indeterminate structures
- Analyze and design thick, thin and compound cylinders subjected to pressure

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9109) ENGINEERING GEOLOGY

II Year B.Tech. Civil Engg. II-Sem	**L**	**T**	**P**	**C**
	3	**1**	**0**	**3**

Pre Requisites: None

Course Objectives :

- Know geology from Civil Engineering point of view
- Understand Mineral and rock properties
- Understands the significance of structural geology
- Understand the concepts of Geophysical methods

UNIT - I

INTRODUCTION: Importance of geology from Civil Engineering point of view. Brief study of case histories of failure of some Civil Engineering constructions due to geological draw backs. Importance of Physical geology, Petrology and Structural geology.

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

UNIT - II

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

PETROLOGY : Definition of rock: Geological classification of rocks into igneous, Sedimentary and metamorphic rocks. Dykes and sills, common structures and textures of igneous. Sedimentary and metamorphic rocks. Their distinguishing features, Megascopic and microscopic and microscopic study of Granite, Dolerite, Basalt, Pegmatite, Laerite, Conglomerate, Sand Stone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.

UNIT - III

STRUCTURAL GEOLOGY : Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults uncomfornities, and joints - their important types and case studies. Their importance Insitu and drift soils, common types of soils, their origin and occurrence in India, Stabilisation of soils. Ground water, Water table, common types of ground water, springs, cone of depression, geological controls of ground water movement, ground water exploration.

UNIT - IV

EARTH QUAKES : Causes and effects, shield areas and seismic belts. Seismic waves, Richter scale, precautions to be taken for building construction in seismic areas. Land slides,

their causes and effect; measures to be taken to prevent their occurrence. Importance of study of ground water, earth quakes and land slides.

IMPORTANCE OF GEOPHYSICAL STUDIES : Principles of geophysical study by Gravity methods. Magnetic methods, Electrical methods. Seismic methods, Radio metric methods and Geothermal method. Special importance of Electrical resistivity methods, and seismic refraction methods. Improvement of competence of sites by grouting etc. Fundamental aspects of Rock mechanics and Environmental Geology.

UNIT - V

GEOLOGY OF DAMS , RESERVOIRS AND TUNNELS: Types of dams and bearing of Geology of site in their selection, Geological Considerations in the selection of a dam site. Analysis of dam failures of the past. Factor's Contributing to the success of a reservoir. Geological factors influencing water Lightness and life of reservoirs - Purposes of tunneling, Effects of Tunneling on the ground Role of Geological Considerations (ie. Tithological, structural and ground water) in tunneling over break and lining in tunnels.

Text Books:

1) Engineering Geology by N.Chennakesavulu, Mc-Millan, India Ltd. 2005
2) Engineering Geology by Subinoy Gangopadhyay, Oxford university press.
3) Engineering Geology by Parbin Singh, S.K.Kataria & Sons.
4) Principles of Engineering Geology by K.V.G.K. Gokhale – B.S publications

References:

1. F.G. Bell, Fundamental of Engineering Geology Butterworths, Publications, New Delhi, 1992.
2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution
3) Engineering Geology for Civil Engineers – P.C. Varghese PHI

Course Outcomes:

- Define geology and its importance in Civil Engineering
- List different properties of Minerals
- Classify the rocks
- Acquire the knowledge of structural geology.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9110) HYDRAULICS & HYDRAULIC MACHINERY

II Year B.Tech. Civil Engg. II-Sem

L	T	P	C
4	0	0	4

Pre Requisites: Fluid Mechanics

Course Objectives:

- Apply fundamental principles of fluid mechanics for the solution of practical Civil Engineering problems of water conveyance in open channels.
- Study, Analyze and Design of channels in uniform and Non-uniform flow conditions.
- Describe the operating characteristics of hydraulic machinery (pumps and turbines) and the factors affecting their operation and specifications, as well as their operation in a system.
- Study and Analyze different types and elements of Hydro Electric Power plants.

UNIT-I

OPEN CHANNEL FLOW: Types of flows - Type of channels – Velocity distribution – Energy and momentum correction factors – Chezy's, Manning's; and Bazin formulae for uniform flow – Most Economical sections. Critical flow: Specific energy-critical depth – computation of critical depth – critical sub-critical and super critical flows. Non uniform flow-Dynamic equation for G.V.F., Mild, Critical, Steep, horizontal and adverse slopes-surface profiles-direct step method- Rapidly varied flow, hydraulic jump, energy dissipation.

UNIT- II

HYDRAULIC SIMILITUDE : Dimensional analysis-Rayleigh's method and Buckingham's pi theorem-study of Hydraulic models – Geometric, kinematic and dynamic similarities-dimensionless numbers – model and prototype relations. Distorted and non-distorted models.

UNIT-III

BASICS OF TURBO MACHINERY : Hydrodynamic force of jets on stationary and moving flat, inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions for work done and efficiency-Angular momentum principle, Applications to radial flow turbines.

UNIT-IV

HYDRAULIC TURBINES : Layout of a typical Hydropower installation – Heads and efficiencies-classification of turbines-pelton wheel-Francis turbine-Kaplan turbine-working, working proportions, velocity diagram, work done and efficiency, hydraulic design, draft tube – theory and function efficiency. Governing of turbines-surge tanks-unit and specific turbines-unit speed-unit quantity-unit power-specific speed performance characteristics-geometric similarity-cavitation .

UNIT-V

CENTRIFUGAL PUMP : Installation details-classification-types work done- Manometric head-minimum starting speed-losses and efficiencies-specific speedmultistage pumps-pumps in parallel- performance of pumps-characteristic curves- NPSH-cavitation.

Classification of Hydropower plants – Definition of terms – load factor, utilization factor, capacity factor, estimation of hydropower potential.

Text Books:

1. K,Subramanya, "Open Channel flow", Tata Mc.Grawhill Publishers-2009.
2. Modi & Seth, "Fluid Mechanics and Hydraulic Machines", Standard book house, New Delhi-2007..
3. D.S. Kumar, "Fluid Mechanics & Fluid Power Engineering", Kataria & Sons-2013.

References :

1. K,Subramanya, "Fluid Mechanics and Hydraulic Machines", Tata McGraw Hill Education Pvt. Ltd-2010
2. by V.T.Chow, "Open Channel flow", Mc.Graw Hill book company- 2007.
3. Rajesh Srivastava, "Flow Through Open Channels", Oxford University Press – 2007.

Course Outcomes:

- Apply fundamental knowledge of fluid mechanics in solving problems and making design of open-channel hydraulics in Civil and Environmental Engineering.
- Describe and apply dimensional analysis and similarity to develop hydraulic models and testing.
- Understand the basics of hydraulic machinery and their operation design in water distribution systems.
- Select and design appropriate pumps, classification, identify and design of hydraulic turbines and their application in Hydro Electric Power plants.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9111) SURVEYING LAB-II

II Year B.Tech. Civil Engg. II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: Surveying Lab-I

Course Objective

- Learn and understand the various basic concept of theodolite
- Learn ad understand the measurement of horizontal angles and vertical angles.
- Learn the concepts of total station.
- Learn and understand how to calculate Area of plot and Ground.

LIST OF EXERCISES:

1. Study of theodolite in detail – Practice for measurement of horizontal and vertical angles
2. Measurement of horizontal angles by method of repetition and reiteration
3. Trigonometric Leveling – Heights and distance problem (Two Exercises)
4. Heights and distance using Principles of tachometric surveying (Two Exercises)
5. Curve setting – (Two Exercises)
6. Determine of area using total station
7. Traversing using total station
8. Contouring using total station
9. Determination of remote height using total station

Course Outcomes

- Measure the horizontal angles using theodolite
- Measure the area using total station
- Prepare contour Map and Estimate the Quantity of earthwork required for formation level for Road and Railway Alignment.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9112) FLUID MECHANICS & HYDRAULIC MACHINERY LAB

II Year B.Tech. Civil Engg. II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows.
- Discuss and practice standard measurement techniques of fluid mechanics and their applications.
- Familiarize the students with the components and working principles of the Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- Learn and practice writing technical reports and to work on small design projects.

List of Experiments

1. Calibration of Venturimeter & Orifice meter
2. Determination of Coefficient of discharge for a small orifice / mouthpiece by constant head method.
3. Calibration of contracted Rectangular Notch and / Triangular Notch
4. Determination of friction factor of a pipe.
5. Determination of Coefficient for minor losses.
6. Verification of Bernoulli's equation.
7. Impact of jet on vanes
8. Study of Hydraulic jump.
9. Performance test on Pelton wheel turbine
10. Performance test on Francis turbine.
11. Performance characteristics of a single stage/ multi-stage centrifugal pump.
12. Performance characteristics of a reciprocating pump.

Course Outcomes:

- Utilize basic measurement techniques of fluid mechanics and able to differentiate among measurement techniques their relevance and applications.
- Demonstrate practical understanding of Minor and friction losses in pipe flows.
- Demonstrate practical working of Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
- Compare the results of analytical models introduced in lecture to the actual behavior of real fluid flows and draw correct and sustainable conclusions.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9113) ENGINEERING GEOLOGY LAB

II Year B.Tech. Civil Engg. II-Sem

L	T	P	C
0	0	3	2

Pre Requisites: None

Course Objectives:

- Identify the mineral name by studying the properties
- Identify the rocks name by studying the properties
- Interpretation of geological maps

List of Experiments

1. Study of physical properties and identification of minerals and rocks referred under theory.
2. Megascopic description and identification of rocks and minerals referred under theory.
3. Microscopic study of rocks.
4. Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.
5. Simple Structural Geology problems.

LAB EXAMINATION PATTERN:

1. Description and identification of SIX minerals
2. Description and identification of Six (including igneous, sedimentary and metamorphic rocks)
3. Inter pretation of a Geological map along with a geological section.
4. Microscopic identification of rocks.

Course Outcomes:

- Identify various Minerals
- Identify the rocks
- Interpret and draw the sections for geological maps showing horizontal beds, vertical beds, inclined beds, folds, faults, unconformities.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9019) GENDER SENSITIZATION
(MANDATORY ELECTIVE)

II Year B.Tech. II-Sem, Civil **L T P C**
2 0 0 0

Pre-Requisites: None

Course Objectives:

- To develop students sensibility with regard to issue of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Unit – 1
Gender: Why Should We Study It?

Unit – 2
Socialization: Making Women, Making Men
2.1 Introduction
2.2 Preparing for womanhood
2.3 Growing up male
2.4 First lessons in caste
2.5 Different masculinities

Unit – 3
Housework: The Invisible Labour
3.1 "My mother does not work"
3.2 "Share the load"

Unit – 4
Missing Women: Sex Selection and Its consequences
4.1 Declining sex ratio
4.2 Demographic consequences

Unit – 5
Knowledge: Through the Lens of Gender
5.1 Point of view
5.2 Gender and the structure of knowledge
5.3 Further reading: Unacknowledged women artists of Telangana

Unit – 6
Sexual Harassment: Say No!
6.1 Sexual harassment, not eve-teasing
6.2 Coping with everyday harassment
6.3 Further reading: "Chupulu"

Unit – 7
Women' Work: Its Politics and Economics
7.1 Fact and fiction
7.2 Unrecognized and unaccounted work
7.3 Further reading: Wages and conditions of work

Unit – 8
Domestic Violence: Speaking Out
8.1 Is home a safe place?
8.2 When women unite [Film]
8.3 Rebuilding lives
8.4 Further reading: New forums for justice

Unit – 9
Whose History? Questions for Historians and Others
9.1 Reclaiming a past
9.2 Writing other histories
9.3 Further reading: Missing pages from modern Telangana history

Unit – 10
Gender Spectrum: Beyond the Binary
10.1 Two or many?
10.2 Struggles with discrimination

Unit – 11
Thinking about Sexual Violence
11.1 Blaming the victim
11.2 "I fought for my life…"
11.3 Further reading: The caste face of violence

Unit – 12
Just Relationships: Being Together as Equals
12.1 Mary Kom and Onler
12.2 Love and acid just do not mix
12.3 Love letters
12.4 Mothers and fathers
12.5 Further Reading: Rosa Parks – The braveheart

Unit – 13
Additional Reading: Our Bodies, Our Health

Course Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labor and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9114) DESIGN OF RC STRUCTURES

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
4	0	0	4

Pre Requisites : Strength of Materials-I and Strength of Materials-II

Course Objectives:

Student will be able to

- Know the salient features of Limit State Method design of RC structures.
- Understand the various codal provisions given in IS. 456-2000.
- Know the behaviour of RC beams under flexure, shear and compression.
- Understand the concepts of limit state of collapse and limit state of serviceability.
- Know the behavior of slabs and footings.

UNIT –I

Concepts of RC. Design – Working Stress Method - Limit State method – Material Stress-Strain Curves – Safety factors – Characteristic values. Stress Block parameters – IS – 456 – 2000.

Beams: Limit state analysis and design of singly reinforced, doubly reinforced, T and L beam.

UNIT –II

Limit state analysis and design of section for shear and torsion – concept of bond, anchorage and development length, I.S. code provisions. Design examples in simply supported and continuous beams, detailing.

UNIT - III

Design of one way slab, two-way slab and continuous slab Using I S Coefficients - Limit state design for serviceability for deflection, cracking and codal provision.

UNIT – IV

Short and Long columns – under axial loads, uniaxial bending and biaxial bending – I S Code provisions.

UNIT – V

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

Design of dog-legged staircase.

Text Books:

1. N. Subramanian, “Design of Reinforced Concrete Structures”, Oxford University Press.
2. P.C.Varghese, “Limit state designed of reinforced concrete”, Prentice Hall of India, New Delhi.

3. S.Unnikrishna Pillai & Devdas Menon, "Reinforced concrete design", Tata Mc.Graw Hill, New Delhi.
4. N. Krishna Raju and R.N. Pranesh, "Reinforced concrete design", New age International Publishers, New Delhi
5. IS 456 – 2000
6. SP-16

References :

1. M.L. Gambhir, "Fundamentals of Reinforced concrete design", Prentice Hall of India Private Ltd., New Delhi.
2. J.N.Bandhyopadhyay, "Design of concrete structures", PHI Learning Private Limited.
3. I.C.Syal and A.K.Goel, "Design of Reinforced Concrete Structures", S.Chand & company.
4. N.C. Sinha and S.K Roy, "Fundamentals of reinforced concrete", S. Chand publishers
5. P.C. Varghese, "Design of Reinforced Concrete Foundations", Prentice Hall of India, New Delhi.
6. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Reinforced concrete structures, Vol.1", Laxmi, publications Pvt. Ltd., New Delhi
7. Arthus H.Nilson, David Darwin, and Chorles W. Dolar, "Design of concrete structures", Tata Mc.Graw-Hill, 3rd Edition, 2005.

Course Outcomes:

After completion of this course, student should be able to

- Design the singly reinforced, doubly reinforced and flanged sections.
- Design the RC beams under flexure, shear and torsion
- Design the one-way slab, two-way slab and staircase.
- Design the axially loaded, uniaxial and biaxial bending columns.
- Design the isolated square, rectangular and circular footings

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9115) GEOTECHNICAL ENGINEERING

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Strength of Materials-I

Course Objectives

Student will be able to

- Understanding of the basic principles of soil mechanics and its application to solve problems related to geotechnical engineering.
- Improve the basic understanding of the index and engineering properties of soils
- Analyze the behavior of soils under various stress conditions
- Evaluate the strength parameters using standard tests.

UNIT – I

INTRODUCTION: Soil formation and structure – moisture content – Mass- volume relationship – Relative density.

INDEX PROPERTIES OF SOILS: Grain size analysis – Sieve– consistency limits and indices – I.S. Classification of soils.

UNIT –II

PERMEABILITY: Soil water – capillary rise – flow of water through soils – Darcy's law-permeability – Factors affecting permeability – laboratory determination of coefficient of permeability –Permeability of layered soils – In-situ permeability tests (Pumping in & Pumping out test).

EFFECTIVE STRESS & SEEPAGE THROUGH SOILS: Total, neutral and effective stress – principle of effective stress - quick sand condition – Seepage through soils – Flownets: Characteristics and Uses.

UNIT –III

STRESS DISTRIBUTION IN SOILS: Boussinesq's and Westergaard's theories for point load, uniformly loaded circular and rectangular areas, pressure bulb, variation of vertical stress under point load along the vertical and horizontal plane, and Newmark's influence chart for irregular areas.

COMPACTION: Mechanism of compaction – factors affecting compaction – effects of compaction on soil properties – Field compaction Equipment – compaction quality control.

UNIT – IV

CONSOLIDATION: Types of compressibility – Immediate Settlement, primary consolidation and secondary consolidation - stress history of clay; e-p and e-log(p) curves – normally consolidated soil, over consolidated soil and under consolidated soil - preconsolidation pressure and its determination - Terzaghi's 1-D consolidation theory – coefficient of consolidation: square root time and logarithm of time fitting methods - computation of total settlement and time rate of settlement.

UNIT - V

SHEAR STRENGTH OF SOILS: Importance of shear strength – Mohr's– Coulomb Failure theories – Types of laboratory tests for strength parameters – strength tests based on drainage conditions – strength envelops – Shear strength of sands - dilatancy – critical void ratio.

Text books:

1 Gopal Ranjan & ASR Rao, "Basic and Applied Soil Mechanics", New age International Pvt . Ltd, New Delhi
2. K.R. Arora, "Soil Mechanics and Foundation Engg." Standard Publishers and Distributors, Delhi.
3. P.C.Varghese, "Foundation Engineering", PHI.

References:

1. VNS Murthy, "Soil Mechanics and Foundation Engineering, CBS Publishers
2. Braja M.Das, "Principals of Geotechnical Engineering", Cengage Learning Publishers.
3. C. Venkataramiah, "Geotechnical Engineering", New age International Pvt . Ltd, (2002).
4. Cuduto, "Geotechnical Engineering Principles and Practices", PHI Intrernational.
5. Manoj Dutta & Gulati S.K, "Geotechnical Engineering", Tata Mc.Grawhill Publishers New Delhi.
6. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Soil Mechanics and Foundation", Laxmi, publications Pvt. Ltd., New Delhi

Course Outcomes

After completion of this course, student should be able to

- Identify, formulate and solve geotechnical engineering problems.
- Improve techniques, skills, and modern engineering tools necessary for understanding in geotechnical engineering practice.
- Know the complete awareness of the classical concept of soil mechanics and its necessity
- Analyze the consolidation settlements and understand the principles of compaction.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9116) CONCRETE TECHNOLOGY

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites : Strength of Materials-I, Engineering Geology

Course Objectives:

Student will be able to

- Use different types of cement as per their properties for different field applications.
- Learn the methods of testing of aggregates.
- Supervise various concreting operations.
- Learn the methods of testing on fresh and hardened concrete.
- Design economic concrete mix proportion for different exposure conditions and intended purposes.

UNIT I

CEMENT: Portland cement – chemical composition – Hydration, Setting of cement – Structure of hydrate cement – Test on physical properties – Different grades of cement. Admixtures : Types of admixtures – mineral and chemical admixtures – relevant IS codal provisions.

UNIT - II

AGGREGATES: Classification of aggregate – Particle shape & texture – Bond, strength & other mechanical properties of aggregate – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate – Bulking of sand – Deleterious substance in aggregate – Soundness of aggregate – Alkali aggregate reaction – Thermal properties – Sieve analysis – Fineness modulus – Grading curves – Grading of fine & coarse Aggregates – Gap graded aggregate – Maximum aggregate size– relevant IS codal provisions..

UNIT – III

FRESH CONCRETE: Workability – Factors affecting workability – Measurement of workability by different tests – Setting times of concrete – Effect of time and temperature on workability – Segregation & bleeding – Mixing and vibration of concrete – Steps in manufacture of concrete – Quality of mixing water–Curing –significance- methods - relevant IS codal provisions..

UNIT - IV

HARDENED CONCRETE : Water / Cement ratio – Abram's Law – Gelspace ratio – Maturity concept.

TESTING OF HARDENED CONCRETE: Compression tests – Tension tests – Factors affecting strength – Flexure tests – Splitting tests – Pull-out test, Non-destructive testing methods – relevant IS codal provisions..

ELASTICITY, CREEP & SHRINKAGE – Modulus of elasticity – Dynamic modulus of elasticity – Posisson's ratio – Creep of concrete – Factors influencing creep – Relation between creep & time – Nature of creep – Effects of creep – Shrinkage – types of shrinkage– relevant IS codal provisions..

Durability of concrete –factors affecting –permeability –Alkalie Aggregate Reaction - chloride attack - sulphate attack - . relevant IS codal provisions..

UNIT – V

MIX DESIGN : Factors in the choice of mix proportions– Quality Control of concrete – Statistical methods – Acceptance criteria – Proportioning of concrete mixes by various methods – BIS method of mix design– relevant IS codal provisions..

SPECIAL CONCRETES: Introduction to Light weight concrete – Cellular concrete – No-fines concrete – High strength concrete – Fibre reinforced concrete – Polymer concrete – High performance concrete – Self compacting concrete– relevant IS codal provisions..

Text books:

1. A.M.Neville, "Properties of Concrete"– Low priced Edition – 4th edition
2. M.S.Shetty, "Concrete Technology", S.Chand & Co. ; 2004
3. Relevant IS codes

References:

1. M.L. Gambhir, "Concrete Technology", Tata Mc. Graw Hill Publishers, New Delhi
2. A.R. Santha Kumar, "Concrete Technology", Oxford university Press, New Delhi
3. P.K.Mehta and J.M.Monteiro, "Concrete: Micro structure, Properties and Materials", Mc-Graw Hill Publishers

Course Outcomes:

After completion of this course, student should be able to

- Develop an advanced knowledge of the mechanical performance of cement based materials and how it can be controlled
- Use various chemical admixtures and mineral additives to design cement based materials.
- Use advanced laboratory techniques to characterize cement-based materials.
- Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests.
- Recognize the effects of the rheology and early age properties of concrete on its long-term behavior.
- Understand the mix design and engineering properties of special concretes such as high-performance concrete, self-compacting concrete, fibre reinforced concrete, etc.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9117) ENGINEERING HYDROLOGY

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
4	0	0	4

Pre Requisites : Fluid Mechanics

Course Objectives:

Student will be able to

- Describe the fundamentals concepts of Engineering Hydrology.
- Explain and derive various formula used in Engineering Hydrology
- Solve basic hydrology problems
- Gain the knowledge to real life hydrology related problems

UNIT I

Introduction to engineering hydrology and its applications, Hydrologic cycle, types and forms of precipitation, rainfall measurement, types of rain gauges, computation of average rainfall over a basin, processing of rainfall data - Adjustment of record -Rainfall Double Mass Curve. Runoff- Factors affecting Runoff – Runoff over a Catchment- Empirical and Rational Formulae.

Abstraction from rainfall-evaporation, factors affecting evaporation, measurement of evaporation- Evapotranspiration- Penman and Blaney & Criddle Methods -Infiltration, factors affecting infiltration, measurement of infiltration, infiltration indices..

UNIT-II

Stream flow measurement- Introduction – Measurement of stage – Measurement of velocity – Area velocity method – Electromagnetic method – Ultrasonic method – Indirect methods – Hydrometry stations.

UNIT-III

Distribution of Runoff – Hydrograph Analysis Flood Hydrograph – Effective Rainfall – Base Flow- Base Flow Separation - Direct Runoff Hydrograph Unit pulse and Unit step function - Unit Hydrograph, definition, limitations and applications of Unit hydrograph, derivation of Unit Hydrograph from Direct Runoff Hydrograph and vice versa - S-hydrograph, Synthetic Unit Hydrograph.

UNIT-IV

Floods – Introduction – Rational method – Unit hydrograph method – Flood frequency studies – Design flood – Risk, Reliability and safety factor.

Flood Routing- Introduction – Basic equations – Hydrologic storage routing – Hydraulic method of flood routing – Nash's conceptual model – Flood forcasting.

UNIT-V

Ground water Occurrence, types of aquifers, aquifer parameters, porosity, specific yield, permeability, transmissivity and storage coefficient, Darcy's law, radial flow to wells in confined and unconfined aquifers. Types of wells,- Well Construction – Well Development.

Text books:

1. K. Subramanya, "Engineering Hydrology", Tata McGraw-Hill Education
2. Jayaram Reddy, "Engineering Hydrology", Laxmi publications pvt. Ltd., New Delhi

References:

1. C.S.P. Ojha, P. Bhunya and R. Berndtsson, "Engineering Hydrology", Oxford Higher Education.
2. P.N.Modi, "Irrigation and Water Resources & Water Power", Standard Book House.
3. D.K. Majundar, "Irrigation Water Management", Printice Hall of India.
4. V.P.Singh, "Elementary hydrology", PHI publications.
5. Ven Te Chow, David R. Maidment larry W. Mays, "Applied hydrology", Tata MC. Graw Hill.

Course Outcomes:

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

- Describe different concepts and terms used in engineering hydrology
- Discuss and explain various common formulae used
- Relate and explain fundamental principles and theories as applied to engineering hydrology
- Solve analytical problems applying appropriate formulae

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9118) RS & GIS
(PROFESSIONAL ELECTIVE-I)

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : None

Course Objectives

Student will be able to

- Understand the concepts of remote sensing which serves the purpose of accurate mapping of all features under different spatial and temporal scales of all kinds of terrain and land under water bodies.
- Understand the concepts of remote sensing its advantageous comparatively to traditional surveying techniques in terms of time, accuracy and output.
- Understand the concepts of GIS, its software which can be used for collecting, storing and analyzing of data which is useful for real world applications.

UNIT – I

Introduction to Photogrammetry: Principle and types of aerial photographs, stereoscopy, Map Vs Mosaic, ground control, Parallax measurements for height, determinations.

Remote Sensing – I: Basic concepts and foundation of remote sensing – elements involved in remote sensing, electromagnetic spectrum, remote sensing terminology and units.

UNIT - II

Remote Sensing – II: Energy resources, energy interactions with earth surface features and atmosphere, resolution, sensors and satellite visual interpretation techniques, basic elements, converging evidence, interpretation for terrain evaluation, spectral properties of water bodies, introduction to digital data analysis.

UNIT – III

Geographic Information System: Introduction, GIS definition and terminology, GIS categories, components of GIS, fundamental operations of GIS, A theoretical framework for GIS.

Types of data representation: Data collection and input overview, data input and output. Keyboard entry and coordinate geometry procedure, manual digitizing and scanning, Raster GIS, Vector GIS – File management, Spatial data – Layer based GIS, Feature based GIS mapping.

UNIT – IV

GIS Spatial Analysis: Computational Analysis Methods (CAM), Visual Analysis Methods (VAM), Data storage-vector data storage, attribute data storage, overview of the data manipulation and analysis. Integrated analysis of the spatial and attribute data.

UNIT – V

Water Resources Applications-I: Land use/Land cover in water resources, Surface water mapping and inventory, Rainfall – Runoff relations and runoff potential indices of watersheds, Flood and Drought impact assessment and monitoring, Watershed management for sustainable development and Watershed characteristics.

Water Resources Applications – II: Reservoir sedimentation, Fluvial Geomorphology, water resources management and monitoring, Ground Water Targeting, Identification of sites for artificial Recharge structures, Drainage Morphometry, Inland water quality survey and management, water depth estimation and bathymetry.

TEXT BOOKS:

1. Thomas Lillesand, Ralph W. Kiefer, Jonathan Chipman, "Remote Sensing and Image Interpretation", 6th Edition, Wiley
2. LRA Narayana, "Remote Sensing and its applications", University Press 1999.
3. Peter A Burragh and Rachael A. Mc Donnell, "Principals of Geo physical Information Systems", Oxford Publishers 2004.

REFERENCES:

1. C.P.Lo Albert, K.W. Yonng, "Concepts & Techniques of GIS", Prentice Hall (India) Publications.
2. Kang – tsung chang, "GIS", TMH Publications & Co.,
3. S.Kumar, "Basics of Remote sensing & GIS", Laxmi Publications.

Course Outcomes:

After completion of this course, student should be able to

- Acquire thorough knowledge to choose the remote sensing image from different sensors, resolutions, spatial and temporal scales.
- Understand remote sensing which gives the provision of understanding and to comprehend large tracks of earth surface with less time and cost but more accuracy.
- Communicate to the common man his analysis of different problems, developments, benefits by preparing different thematic maps.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9119) ENVIRONMENTAL IMPACT ASSESSMENT
(PROFESSIONAL ELECTIVE-I)

III B.Tech. Civil Engg. I Sem

L	T	P	C
3	1	0	3

Pre Requisites : None

Course Objectives:

Student will be able to

- Understand the concepts of Environmental Impacts and assessment
- Understand the EIA methodology
- Understand about environmental audits

UNIT – I

Basic concept of EIA : Initial environmental Examination, Elements of EIA, - factors affecting E-I-A Impact evaluation and analysis, preparation of Environmental Base map, Classification of environmental parameters.

E I A Methodologies: introduction, Criteria for the selection of EIA Methodology, E I A methods, Ad-hoc methods, matrix methods, Network method Environmental Media Quality Index method, overlay methods, cost/benefit Analysis.

UNIT-II

Assessment of Impact of development Activities on Vegetation and wildlife, environmental Impact of Deforestation – Causes and effects of deforestation.

UNIT-III

Procurement of relevant soil quality, Impact prediction, Assessment of Impact significance, Identification and Incorporation of mitigation measures.

UNIT – IV

Environmental Audit & Environmental legislation objectives of Environmental Audit, Types of environmental Audit, Audit protocel, stages of Environmental Audit, onsite activities, evaluation of Audit data and preparation of Audit report, Post Audit activities.

UNIT - V

The Environmental Protection Act, The water Act, The Air (Prevention & Control of pollution Act.), Motor Act, Wild life Act. Case studies and preparation of Environmental Impact assessment statement for various Industries.

Text Books:

1. Y. Anjaneyulu, Valli Manickam, "Environmental Impact Assessment Methodologies", CRC Press, 2011.
2. Larry Canter, "Environmental Impact Assessment", McGraw-Hill Publications
3. Barthwal, R. R. B., "Environmental Impact Assessment", New Age International Publications

References:

1. Glynn, J. and Gary, W. H. K., "Environmental Science and Engineering", Prentice Hall
   Publishers
2. Suresh K. Dhaneja, "Environmental Science and Engineering", S.K.,Katania & Sons Publication., New Delhi.
3. Bhatia, H. S., "Environmental Pollution and Control", Galgotia Publication(P) Ltd, Delhi.
4. Wathern, P., "Environmental Impact Assessment: Theory & Practice", Publishers-Routledge, London, 1992.

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of Environmental impacts
- Understand environmental clearances and guidelines
- Prepare an audit report
- Understands environment laws and regulations

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9120) STRUCTURAL ANALYSIS – II
(PROFESSIONAL ELECTIVE-I)

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Structural Analysis-I

Course Objectives:

Student will be able to

- Idealize and analyze statically determinate and indeterminate structures
- Introduce Displacement methods of analysis for statically indeterminate structures.
- Introduce the approximate methods of analysis for both gravity and Lateral loads.
- Introduce Matrix methods of analysis for statically indeterminate structures.
- Learn the influence of moving loads on structure.

UNIT – I

SLOPE DEFLECTION METHOD: Determination of static and kinematic indeterminacies for frames. Analysis of Single Bay – single storey Portal Frames Including Side Sway& settlement of supports - Shear force and bending moment diagrams.

UNIT – II

MOMENT DISTRIBUTION METHOD - Analysis of Single Bay Single Storey Portal Frames including side Sway& settlement of supports Analysis of inclined frames.

UNIT – III

KANI's METHOD: Analysis of continuous beams including settlement of supports. Analysis of single bay single storey and single bay two Storey Frames by Kani's Method including Side Sway. Shear force and bending moment diagrams.

APPROXIMATE METHODS OF ANALYSIS: Introduction – Analysis of multi-storey frames for lateral loads: Portal Method, Cantilever method and Factor method. Analysis of multi-storey frames for gravity (vertical) loads. Substitute Frame method.

UNIT – IV

MATRIX METHODS OF ANALYSIS: Introduction to Flexibility and Stiffness matrix methods of analyses using 'system approach' upto three degree of indeterminacy– Analysis of continuous beams including settlement of supports using flexibility and stiffness methods. Analysis of pin-jointed determinate plane frames using flexibility and stiffness methods- Analysis of single bay single storey portal frames including side sway using only stiffness method. Shear force and bending moment diagrams.

UNIT- V

MOVING LOADS and INFLUENCE LINES: Introduction maximum SF and BM at a given section and absolute maximum S.F. and B.M due to single concentrated load U.D load longer than the span, U.D load shorter than the span, two point loads with fixed distance between them and several point loads-Equivalent uniformly distributed load-Focal length. Definition of influence line for SF, Influence line for BM- load position for maximum SF at a

section-Load position for maximum BM at a section - Point loads, UDL longer than the span, UDL shorter than the span- Influence lines for forces in members of Pratt and Warren trusses. Equivalent uniformly distributed load. Focal length.

Text Books:

1) C.S.Reddy, "Basic Structural Analysis", Tata McGraw Hill Publishers.
2) G.S. Pandit S.P.Gupta, "Structural Analysis Vol I & II", Tata McGraw Hill Edu. Pvt. Ltd.

References:

1) H.J.Shah and S.B.Junnarkar, "Mechanics of Structures Vol –II", Charotar Publishing House Pvt. Ltd.
2) Vazarani and Ratwani, "Structural Analysis Vol –I &II", Khanna Publishers.
3) S.S.Bhavikatti, "Structural Analysis –II", Vikas Publishing House Pvt. Ltd.
4) Devdas Menon, "Structural Analysis", Narosa Publishing House.
5) A.K.Jain, "Advanced Structural Analysis", Nem Chand & Bros.
6) R.Vaidyanathan and P.Perumal, "Structural Analysis Vol I & II", Lakshmi Publications House Pvt. Ltd.
7) William M.C.McKenzie, "Examples in structural Analysis", Taylor & Francis.

Course outcomes:

After completion of this course, student should be able to

- Determine deflections of beams using classical methods.
- Solve statically indeterminate beams and portal frames using classical methods.
- Draw SFD and BMD for indeterminate structures.
- Solve statically indeterminate structures using Approximate methods.
- Draw the influence of moving loads on the structure.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9621) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(OPEN ELECTIVE-I)

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites : None

Objectives:
To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations namely. Demand and supply, production function, cost analysis, markets forms of business organizations, capital budgeting and financial accounting and financial analysis by using ratios.

UNIT – I
Introduction to Managerial Economics: Definition, Nature and Scope Managerial Economics Demand Analysis: Demand Determinants, Law of Demand and its exceptions, Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

UNIT – II
Production and Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts, Opportunity cost, Fixed Vs. Variable costs, Explicit costs Vs.Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)-Managerial Significance and limitations of BEA.

UNIT – III
Introduction to Markets & Pricing strategies: Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Strategies, Business & New Economic Environment: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

UNIT – IV
Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance, Nature and scope of capital budgeting, features of capital budgeting proposals, methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

UNIT – V

Introduction to Financial Accounting & Financial Analysis: Double-Entry Book Keeping, Journal, Ledger, Trial Balance – Final Account (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.) Computation, Analysis and Interpretation of Liquidity Ratios (Current Ration and quick ratio), Activity Ratios (Debt-Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS

1) Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
2) Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

REFERENCES

1) Ambrish Gupta,Financial Accounting for Management, Pearson Education, New Delhi, 2004.
2) Shim & Siegel: Financial Accounting (Schaum's Outlines), 2/e TMH, 2004
3) Chary: Production and Operations Management, 3/e, TMH, 2004.
4) Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson, 2003.
5) Narayanaswamy: Financial Accounting-A Managerial Perspective, PHI, 2005.
6) Peterson & Lewis: Managerial Economics, 4th Edition, Pearson Education, 2004.
7) Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Scitech, 2005.
8) S.N.Maheswari & S.K. Maheswarial, Financial Accounting, Vikas, 2005.
9) Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2004.
10) Dwivedi: Managerial Economics, 6th Ed., Vikas, 2002.
11) Yogesh Maheswari: Managerial Economics, 2nd Ed., PHI, 2005

Course Outcomes:

1) To study fundamental concepts in managerial economics and financial analysis including certain basic issues governing the business operations.
2) To learn the concepts of demand, elasticity of demand and demand forecasting and methods of demand forecasting.
3) To learn various issues involved in production decision analysis.
4) To gain the knowledge of Break – Even Analysis and its importance in managerial decision making.
5) To learn different types of market environment under various types of competition.
6) To gain the knowledge of new economic environment in post – liberalization scenario.
7) To know the concepts of capital budgeting and various methods of capital budgeting and its application in business decision making.

Learning Outcomes:

1) Have an ability to understand the market dynamics namely, demand, demand forecasting, elasticity of demand, pricing methods and pricing in different market structures.
2) Gain an insight into how production function is carried out to achieve least cost combination of inputs and cost analysis.
3) Have an ability to understand the application of BEA in business decision making.
4) Have an ability to understand how capital budging decisions are carried out in business organization.
5) Have an ability to record the business transactions and following accounting process.
6) Have an ability to analyse and interpret the financial statements through ratio analysis.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9511) DATABASE MANAGEMENT SYSTEMS
(OPEN ELECTIVE-I)

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	0	0	3

Pre Requisite: None

Objectives:

This Course provides an emphasis on how to organize, maintain and retrieve information efficiently and effectively from a Database and it presents an introduction to database management systems (DBMS) and relational data model. Also the course introduces the concepts of transactions and transaction processing and the issues and techniques relating to concurrency and recovery in multi-user database environments

UNIT-I (15%)

Introduction - Database system Applications - Database System versus File Systems - View of Data– Instances and schema - Data Models - Database Languages -DDL-DML - Database Users and Administrator –Transaction Management - Database System Structure-Application Architectures – History of Database Systems.

UNIT-II (20%)

Database Design and ER model – Basic concepts - Entity sets and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram- Weak Entity Sets - Extended E-R Features - Designing of an E-R Database Schema-Reduction of an E-R Schema to Tables.

UNIT – III (20%)

Introduction to the Relational Model – Structure of Relational Databases - Relational Algebra –Relational Calculus – Domain relational Calculus , Touple Relational Calculus - Integrity and Security –Domain Constraints ,Referential Integrity Constraints-Triggers-security and Authorization – SQL- Basic Structure, Set operations ,Aggregate Operations –Null values-Nested Sub queries – Views –Modification of Database- Joined relations ,Data Definition Language, Embedded SQL ,Dynamic SQL.

UNIT – IV(20%)

First Normal Form ,Pitfalls in Relational Database Design-Functional Dependencies–Decomposition–Desirable properties of Decomposition-Boyce-Codd Normal Form-Third Normal Form- Fourth Normal Form.

Transactions-Transaction Concept- Transaction state- Implementation of atomicity and Durability-Concurrent Executions–Serializability, Recoverability-Implementation of Isolation

UNIT-V (25%)

Concurrency Control-Lock Based Protocols, Timestamp Based Protocols, Validation Based Protocols, Multiple Granularity, Dead Lock Handling-Recovery System – Failure Classification, Storage Structure , Recovery and Atomicity,Log Based recovery ,Shadow Paging, Recovery with concurrent transactions.

Storage and File Structure - File Organization – Organization of records in file - Data Dictionary Storage – Indexing and Hashing – Basic Concepts , Ordered Indices,B+Tree Index files, B- tree index files – Static Hashing – Dynamic Hashing – Comparison of Indexing and Hashing.

TEXTBOOKS.

1. Database System Concepts, Silberschatz, Korth , Fourth Edition, McGraw hill
   (Chapters 1,2 excluding 2.10,3,4 excluding 4.8,4.14,6 excluding 6.6, 6.7,7 excluding 7.9, 7.10,11 excluding 11.1 to 11.5,12 excluding 12.8, 12.9, 15 excluding 15.8, 15.9,
   16 excluding 16.5, 16.7, 17 excluding 17.7 to 17.10).

REFERENCES :

1. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
2. Database Management Systems, Raghuramakrishnan, Johannes Gehrke, TATA Mc GrawHill
3. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.

COURSE OUTCOMES:

CO-1. A strong foundation in core Computer Science and Engineering, both theoretical applied concepts.
CO-3. Ability to model, understands, and develop complex software for system software as well as application software.
CO-7. The broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal and human contexts .
CO-9. A Knowledge of Contemporary Issues.

LEARNING OUTCOMES:

1. Ability to understand the fundamental concepts of database management.
2. Ability to design and query databases, as well as understand the internals of databases.
3. Ability to define basic functions of DBMS & RDBMS.
4. Ability to describe database development process and to apply the Relational Database Model to understand the Logical and Physical aspects of the DBMS architecture.
5. Ability to analyze database models & entity relationship models and to draw the E-R diagram for the given case study.
6. Ability to use Structured Query Language (SQL) with complex queries.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9121) AIR POLLUTION AND CONTROL
(OPEN ELECTIVE-I)

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	0	0	3

Pre Requisites : None

Course Objectives:

Student will be able to

- Develop an understanding of Air pollution Concepts
- Develop an understanding of Effects of air pollution
- Develop an understanding of Air pollution Control devices
- Develop an understanding of Air quality monitoring devices

UNIT – I

Air Pollution-Definitions, Scope, Significance and Episodes, Air Pollutants-Classifications-Natural and Artificial-Primary and Secondary, point and Non-Point, Line and Areal Sources of air pollution- stationary and mobile sources.

UNIT – II

Effects of Airpollutants on man, material and vegetation; Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

UNIT-III

Thermodynamics and Kinetics of Air-pollution – Applications in the removal of gases like SO_x; NO_x; CO; HC etc., air-fuel ratio. Computation and Control of products of combustion.
Meteorology and plume Dispersion; properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity; Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

UNIT-IV

Lapse Rates, Pressure Systems, Winds and moisture plume behaviour and plume Rise Models; Gaussian Model for Plume Dispersion.
Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control.
Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

UNIT – V

General Methods of Control of NO_x and SO_x emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.
Air Quality Management – Monitoring of SPM, SO_x; NO_x and CO Emission Standards.

Text books:

1. M.N.Rao and H.V.N.Rao, "Air pollution", Tata Mc.Graw Hill Company.
2. Wark and Warner, "Air pollution", Harper & Row, New York.

Reference:

1. Noel de Nevers, "Air Pollution and Control Engineering", McGraw Hill, 2000.
2. Rao C.S, "Environmental Pollution Control Engineering", Wiley Eastern Limited, India, 1993.
3. K.V.S.G. Murali Krishna, "Air pollution and control", Kaushal Publishers. Kakinada.

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of Air pollution Concepts
- Acquire the knowledge of Effects of air pollution
- Acquire the knowledge of Air pollution Control devices
- Acquire the knowledge of Air quality monitoring devices

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9122) CONCRETE TECHNOLOGY LAB

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
0	0	3	2

Pre Requisites : None

Course Objectives

Student will be able to

- Understand the test procedures to find Physical properties of Cement
- Understand the test procedures to find Specific Gravity of Aggregates.
- Understand the test procedures to find properties of Fresh Concrete
- Understand the test procedures to find properties of Hardened Concrete

I. Test on Cement

1. Normal Consistency, Initial setting time and final setting time of cement
2. Specific gravity of cement
3. Soundness of cement by Lechatlier's apparatus.
4. Compressive strength of cement.

II. Test on Aggregate

1. Specific gravity of fine and coarse aggregates.
2. Fineness modulus of fine and coarse aggregates-grading curve.

III. Test on Fresh Concrete – Workability tests

1. Slump test
2. Compaction factor
3. Flow Table Test

IV. Test on hardened concrete

1. Compressive strength of concrete
2. Split Tensile strength of concrete

V. Non Destructive test of concrete- Demonstration

1. Rebound hammer

TEXT BOOK:

1. M.S. Shetty, "Concrete Technology", S.Chand & Co.
2. M.L. Gambhir, "Concrete Manual", Dhanpat Rai & Sons
3. Relevant IS codes

Course Outcomes:

After completion of this course, student should be able to

- Test Fineness, Specific Gravity, Setting Time, Soundness and Compressive Strength of Cement
- Test Specific Gravity of Coarse Aggregate and Fine Aggregate
- Test Workability of Fresh Concrete
- Test Compressive strength, Split Tensile Strength of Hardened Concrete.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9123) STRUCTURAL DETAILING LAB - RCC

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
0	0	3	2

Course Objectives

Student will be able to

- Analyze the detailing of reinforcement to be provided in beams
- Analyze the detailing of reinforcement to be provided in slabs.
- Analyze the detailing of reinforcement to be provided columns..
- Analyze the detailing of reinforcement to be provided in footings.

LIST OF EXCERCISES

1. Detailing of reinforcement in Beam Sections (Both Singly & Doubly Reinforced Beams)
2. Detailing of reinforcement in Simply supported Beams (Both Singly & Doubly Reinforced Beams)
3. Detailing of reinforcement in Cantilever Beams (Both Singly & Doubly Reinforced Beams)
4. Detailing of reinforcement in Continuous Beams (Both Singly & Doubly Reinforced Beams)
5. Detailing of reinforcement in RC one way, two way slab
6. Detailing of reinforcement in square, rectangular and tied Columns.
7. Detailing of reinforcement in spirally reinforced columns.
8. Detailing of reinforcement in RC isolated footings - square, rectangular & circular.
9. Detailing of reinforcement in RC combined footings.
10. Detailing of reinforcement in dog legged stair case.

Course Outcomes

After completion of this course, student should be able to

- Understand the detailing of reinforcement to be provided in beams
- Understand the detailing of reinforcement to be provided in slabs.
- Draw the detailing of reinforcement to be provided columns..
- Draw the detailing of reinforcement to be provided in footings.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9014) ENVIRONMENTAL STUDIES

III Year B.Tech. Civil Engg. I-Sem

L	T	P	C
2	0	0	0

Pre Requisites : None

Course Objectives:

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understanding 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, Field visits.

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 resources:** Forest resources, **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

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: habital loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV: Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types ofpollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waster:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary. Overview of air pollution control technologies, Concepts of bioremediation. **Global Environmental Problems and Global Efforts:** Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and Montreal Protocol.

UNIT-V: Environmental Policy, Legislation & EIA: 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). **Towards Sustainable Future:** Concept of Sustainable Development, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

Course Outcomes: After undergoing the course the student would be able to know about

1. Understanding of Ecosystem,
2. Natural resources, Depletion of natural resources & prevention of natural resources.
3. Biodiversity, Protection, sharing of the biodiversity.
4. Environmental pollution, Understanding of water, soil, noise, air pollutions and their control measurements following the rules of environmental policy, legislation. Working towards the sustainable future.

SUGGESTED TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagoplalan, Oxford University Press.

REFERENCE BOOKS:

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9124) DESIGN OF STEEL STRUCTURES

III Year B.Tech. Civil Engg. II-Sem

L	T	P	C
4	0	0	4

Pre Requisites : Design of RC Structures

Course Objectives:

Student will be able to

- Know about the manufacturing process of steel, types of steel and their properties
- Understand the salient features of Limit State Method of design of Steel structures.
- Understand the various codal provisions given in IS. 800.
- Know the behaviour of steel structures under tension, compression and flexure.
- Understand the behavior of plate girder and roof trusses.

UNIT – I

Materials-types of structural steel-mechanical properties of steel-Concepts of plasticity-yield strength. Loads-and combinations local buckling behavior of steel. Concept of limit State Design-Limit States-Design Strengths-deflection limits-serviceability-stability check. Bolted connections-Riveted connections-IS-800-2007- specifications-Design strength-efficiency of joint-prying action. Welded connections-Types of welded joints-specifications-design requirements.

UNIT – II

Design of tension members- Design strength- Design procedure splice - lug angle.
Design of compression members-Buckling class- slenderness ratio / strength design- laced – battened columns- splice- column base- slab base.

UNIT – III

Design of Beams-Plastic moment- Bending and shear strength/ buckling – Builtup sections – laterally / supported beams - Design of eccentric connections – Framed – stiffened / seat connection.

UNIT – IV

Design of plate girders – elements – economical depth – design of main section – connections between web and flange – design of end bearing – intermediate stiffeners – Design of Web splice & Flange splice.

UNIT – V

Design of roof trusses – Types of roof trusses, loads on trusses – purlin design – truss design, Design of joints and end bearings.

Text books :

1. Design of steel structures – N. Subramanian, Oxford University Press – 2009.
2. Limit State Design of steel structures, S.K. Duggal, Tata McGraw-Hill, 2010
3. Relevant IS codes.

Reference books:

1. Design of Steel structures by K.S. Sai Ram, Person Education.
2. Design of Steel Structures Edwin H. Gaylord, Jr. Charles N. Gaylord and James Stallmeyer Tata McGraw-Hill Education pvt. Ltd.
3. Design of Steel Structures Vol. 1 & 2 – Ramchandra, Standard Publications.
4. Design of steel structures, Structures, S.S. Bhavikatti, IK int Publication House, New Delhi, 2010.
5. Structural Design and Drawing by N.Krishna Raju, Universities Press.

Course Outcomes:

After completion of this course, student should be able to

- Design the tension members and compression members.
- Design the slab and gusset type column bases.
- Design the welded plate girder and various stiffeners.
- Design the various components of roof trusses.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9125) IRRIGATION ENGINEERING

III B.Tech. Civil Engg. II-Sem

L	T	P	C
4	0	0	4

Pre Requisites : None

Course Objectives:

Student will be able to

- Describe and explain the fundamental principles and terminologies used in Irrigation Engineering.
- Explain different Irrigation System components and their significance
- Apply the Engineering Hydrology knowledge for the design of a irrigation system
- Enable the students to design main components of a Irrigation System

UNIT-I

Necessity and Importance of Irrigation, advantages and ill effects of Irrigation, types of Irrigation, methods of application of Irrigation water, Indian agricultural soils, methods of improving soil fertility –Crop Rotation, preparation of land for Irrigation, standards of quality for Irrigation water.

Soil-water-plant relationship, vertical distribution of soil moisture, soil moisture constants, soil moisture tension, consumptive use, Duty and delta, factors affecting duty- Design discharge for a water course. Depth and frequency of Irrigation, irrigation efficiencies-Water Logging.

UNIT-II

Classification of canals, Design of Irrigation canals by Kennedy's and Lacey's theories, balancing depth of cutting, IS standards for a canal design canal lining.

Design Discharge over a catchment, Computation of design discharge-rational formulae etc.

Storage Works-Reservoirs - Types of reservoirs, selection of site for reservoir, zones of storage of a reservoir, reservoir yield, estimation of capacity of reservoir using mass curve-Reservoir Sedimentation – Life of Reservoir.. Types of dams, factors affecting selection of type of dam, factors governing selection of site for a dam.

UNIT-III

Gravity dams: Forces acting on a gravity dam, causes of failure of a gravity dam, elementary profile and practical profile of a gravity dam, limiting height of a low gravity dam, Factors of Safety - Stability Analysis, Foundation for a Gravity Dam, drainage and inspection galleries.

Earth dams: types of Earth dams, causes of failure of earth dam, criteria for safe design of earth dam, seepage through earth dam-graphical method, measures for control of seepage.Spillways: types of spillways, Design principles of Ogee spillways - Spillway gates. Energy Dissipaters and Stilling Basins Significance of Jump Height Curve and Tail Water Rating Curve - USBR and Indian types of Stilling Basins.

UNIT-IV

Diversion Head works: Types of Diversion head works- weirs and barrages, layout of diversion head work - components. Causes and failure of Weirs and Barrages on permeable foundations,-Silt Ejectors and Silt Excluders

Weirs on Permeable Foundations – Creep Theories - Bligh's, Lane's and Khosla's theories, Determination of uplift pressure- Various Correction Factors – Design principles of weirs on permeable foundations using Creep theories - exit gradient, U/s and D/s Sheet Piles - Launching Apron.

UNIT-V

Canal Falls - types of falls and their location, Design principles of Notch Fall and Sarada type Fall.

Canal regulation works, principles of design of distributory and head regulators, Canal Cross Regulators -canal outlets, types of canal modules, proportionality, sensitivity and flexibility. Cross Drainage works: types, selection of site,

Text books:

1. Irrigation engineering and hydraulic structures by S.K Garg, Khanna publishers.
2. Irrigation and water power engineering by Punmia & Lal, Laxmi publications pvt. Ltd., New Delhi

References:

1. Irrigation and water resources engineering by G.L. Asawa, New Age International Publishers
2. Theory and Design of Hydraulic structures by Varshney, Gupta & Gupta
3. Irrigation Water Resources Engineering by Arora K.L., Standard Book Publishing Co., Delhi, 1996.
4. Irrigation Engineering by R.K. Sharma and T.K. Sharma, S. Chand Publishers
5. Introduction to hydrology by Warren Viessvann, Jr, Garyl. Lewis, PHI

Course Outcomes

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

- Plan an Irrigation system.
- Design irrigation canals and canal networks.
- Analyze gravity and earth dams.
- Plan and design diversion head works.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9126) HIGHWAY ENGINEERING

III Year B.Tech. Civil Engg. II-Sem

L	T	P	C
4	0	0	4

Pre Requisites : None

Course Objectives:

Student will be able to

- Introduced to classification of highways, urban roads and its related planning process.
- Analyze different elements used in design of road geometrics.
- Formulate the fundamental principles of traffic flow, traffic characteristics, its measurements and their interpretation for infrastructure changes or development.
- Recognize the importance of road materials used in design of rigid and flexible pavements.

UNIT I

HIGHWAY DEVELOPMENT AND PLANNING:

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

UNIT – II

HIGHWAY GEOMETIC DESIGN: Importance of Geometric Design - Design controls and Criteria - Highway Cross Section Elements - Sight Distance Elements- Stopping Sight Distance, Overtaking Sight Distance and Intermediate Sight Distance - Design of Horizontal Alignment - Design of Super elevation and Extra widening- Design of Transition Curves- Design of Vertical alignment-Gradients- Vertical curves.

UNIT – III

TRAFFIC ENGINEERING & REGULATIONS :

Basic Parameters of Traffic-Volume, Speed and Density - Traffic Volume Studies - Data Collection and Presentation - Speed studies - Data Collection and Presentation - Origin & Destination studies, Parking Studies – On street & Off street Parking - Road Accidents - Causes and Preventive Measures - Accident Data Recording – Condition Diagram and Collision Diagrams - Traffic Signs – Types and Specifications – Road Markings - Need for Road Markings-Types of Road Markings - Design of Traffic Signals – Webster Method.

UNIT – IV

INTERSECTION DESIGN :

Types of Intersections – Conflicts at Intersections – Requirements of At-Grade Intersections - Types of At-Grade Intersections: Channelized and Un-channelized Intersections – Traffic Islands - Types of Grade Separated Intersections - Rotary Intersection – Concept of Rotary – Design Factors of Rotary – Advantages and Limitations of Rotary Intersections.

UNIT - V

PAVEMENT DESIGN

Design of Pavements : Design of Flexible pavement by CBR method as per IRC 37-2012 and theory of empirical mechanistic method. Stresses in rigid pavement by westergards and IRC methods. Design of overlay by Benkelman beam method.

Text books:

1. Highway Engineering by S.K. Khanna, C.E.G. Justo and Veeraraghavan A, Nemchand & Bros., 10th edition (2013).
2. Traffic Engineering & Transportation Planning – Dr.L.R.Kadyali, Khanna Publications – 6th Edition – 1997.

References:

1. Principles of Traffic and Highway Engineering – Garber & Hoel, Cengage Learning.
2. Principles and Practices of Highway Engineering – Dr.L.R.Kadiyali and Dr.N.BLal - Khanna Publications.
3. Highway Engineering – S.P.Bindra , Dhanpat Rai & Sons. – 4th Edition (1981)
4. IRC 37-2012 : Tentative guidelines for design of flexible pavement
5. IRC 58-2011: Guidelines for design of plain jointed rigid pavements.
6. IRC 81-1997 : Guidelines for design of overlay using Benkalman Beam Deflection Technique

Course Outcomes:

After completion of this course, student should be able to

- Classify roads based on functional classification,
- Describe design element: sight distance, horizontal curvature, super elevation, grades, visibility on vertical curves, cross section elements
- Use fundamental physics and mathematical knowledge in deriving geometric design equations
- Plan surveys, preparation of survey forms and data collection from field for highway design
- Design rigid and flexible payments.

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VAAGDEVI COLLEGE OF ENGINEERING
AUTONOMOUS

(A9624) ENTREPRENEURSHIP DEVELOPMENT
(OPEN ELECTIVE-II)

III B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Course Objective: The objective of the course is to make students understand the nature of entrepreneurship, and to motivate the student to start his/her own enterprise. The objective of the course is to enlighten with the fragrance of Corporate Good Governance and Business Ethics, so that they would become the best entrepreneurs / managers of the corporate world.
Learning Outcome: By the end of this course the students should be able to understand the mindset of the entrepreneurs, identity ventures for launching, develop an idea on the legal framework and also understand strategic perspectives in entrepreneurship.

Unit – I
Nature of Entrepreneurship; Characteristics – Qualities and skills of an Entrepreneur – Functions of entrepreneur – Entrepreneur scenario in India and Abroad. Forms of Entrepreneurship: Small Business – Importance in Indian Economy – Types of ownership – Sole trading – Partnership – Joint stock company and other forms. First – Mover disadvantages, Risk Reduction strategies, Market scope strategy, Imitation strategies and Managing Newness

Unit – II
Aspects of Promotion: Generation of new entry opportunity, SWOT Analysis, Technological Competitiveness, legal regulatory systems, patents and trademarks, Intellectual Property Rights- Project Planning and Feasibility Studies- Major steps in product development. Financial Aspects: Sources of raising Capital, Debt-Equity, Financing by Commercial Banks, Government Grants and Subsidies, Entrepreneurship Promotion Schemes of Department of Industries (DIC), KVIC, SIDBI,NABARD, NSIC, APSFC, IFCI and IDBI. New Financial Instruments.

Unit - III
Introduction to Business Ethics: Necessity for Business Ethics-Need for Ethical guideline – Salient Issues in Ethics and Commerce- Ethics as a Luxury – Earlier attempts at Ethics in Industry – Justification for Ethics – Effect of Migration of National Character – Shadow Economy – Basic Principles in Ethics – Corporate Climate and corporate climate audits – Political Issues – Nature and theory of Ethics – The Naturalistic fallacy - G.E.Moore's Philosophy.

Unit – IV
Understanding Corporate Governance: Corporate Governance- Capitalism at crossroads – Historical perspective of Corporate Governance – Issues of Corporate Governance – Theoretical basis of Corporate Governance – Corporate Governance mechanisms – Indian Model of Governance – Good Corporate Governance – Corporate Governance committees – OECD Principles – Indian Committee and guidelines – The confederation of Indian Industry's initiative. Corporate Governance Models, Corporate Social Responsibility.

Unit – V

Corporate Social Responsibility: System Concept of Business Society – Social Responsibility – Social Responsibility tools – approaches to Ethics – Corporate Social Accountability - Business in a Social World – Ethics and Social Responsibility – professional ethics – Ethics of practicing company secretaries- Ethical investing.

Text Books:

1. Robert D Hisrich, Michael P Peters, Dean A Shepherd: Entrepreneurship, TMH, 2009
2. Vasanth Desai: Entrepreneurship, HPH, 2009
3. C.S.V.Murthy: Business Ethics & Corporate Governance, Himalaya, 2009.

References:

1. Bholanath Dutta: Entrepreneurship Text and Cases, Excel, 2009
2. David Martin: Corporate Governance, Viva, 2009
3. H. Nandan: Fundamentals of Entrepreneurship, PHI, 2009.
4. Barringer: Entrepreneurship, Pearson,2009.
5. Ronald D Francis & Mukti Mishra: Business Ethics, TMH, 2009
6. RK Mishra,Gitarani: Corporate Governance, Excel,2009
7. A.C.Frenando: Corporate Governance, Pearson, 2006
8. V.Balachandran & V.Chandrasekaran: Corporate Governance & Social Responsibility, PHI, 2009
9. A.C.Fernando: Business Ethics, Pearson, 2009
10. Laura P Hartman & Abha Chatterjee: Business Ethics, TMH, 2009
11. Tripat Kaur: Values and Ethics in Management, 2/e, Paragon International,2009.

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VAAGDEVI COLLEGE OF ENGINEERING
AUTONOMOUS

(A9625) TOTAL QUALITY MANAGEMENT
(OPEN ELECTIVE-II)

III B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Course Objective:
The objective of this course is to facilitate students appreciate the quality concepts and develop an understanding of tools and techniques relating to total quality management.

UNIT-I:
Principles and Practices-I: Introduction,- Gurus of TQM,- Historic Review,- Benefits of TQMLeadership, characteristics of Quality leaders.-The Deming Philosophy-Quality councils-Strategic Planning - Customer Satisfaction-Customer perception of Quality-service Quality,-Customer Retention-Employee Involvement-Employee survey-Empowerment-Gain sharing-Performance Appraisal.

UNIT-II:
Principles and Practices-II: Continuous process Improvement,- the Juran trilogy,- The PDCA Cycle-
Kaizen- Reengineering. Supplier Partnership- Partnering-Sourcing-Supplier Selection-Supplier rating-
Performance Measures-Basic concept-Strategy-Quality cost- Bench marking- reasons for bench marking-Process-Understanding current performance-Pitfalls and criticism of benchmarking.

Unit-III:
Tools and Techniques-I: Information Technology-Computers and the quality functions-Information
quality Issues-Quality management System-Benefits of ISO registration-ISO 9000 series Standards-
Internal Audits. Environmental Management System-ISO 14000 series-Benefits of EMS-Relation to
Healthy and safety-Quality Function Deployment-The voice of the Customer- Building a House of Quality-QFD Process.

UNIT-IV:
Tools and Techniques-II: Quality by Design- Benefits-Communication Model-Failure Mode and Effective Analysis-Failure Rate, FMEA Documentation-The process of FMEA Documentation-Product liability-Proof and Expert Witness. Total Productive Maintenance-promoting the Philosophy and Training-Improvements and needs- Autonomous Work groups.

UNIT-V:
Management Tools: Management Tools,-Introduction-Forced field Analysis-Tree diagram-Process
decision Program Chart-Statistical Process Control-Cause and Effect diagram-Histogram-state of control – Process Capability- Experimental Design-Hypothesis-Orthogonal Design-

Two factors and Full factors-Quality Strategy for Indian Industries-Quality Management in India.

TEXT BOOKS:

1. Joel E Ross : Total Quality Management, 3rd Edition,CRC press, 2015
2. Dale H.Besterfeild, carlon Besterfeild: Total Quality Management, Pearson Education, 2015
3. Sridhara bhat: Total Quality Management Texts and Cases, Himalaya, 2015.
4. Poornima M charantimath Total Quality Management, Pearson Education, 2015
5. Kanishka Bedi: Quality Management, Oxford, 2015.
6. Dr.S.Kumar, Total Quality Management, University Science Press, 2015

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9127) DISASTER MANAGEMENT
(OPEN ELECTIVE-II)

III Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : None

Course Objectives:

Student will be able to

- Understand the difference between a hazard and disaster
- Know about various disasters and their impacts
- Understand different approaches of disaster risk reduction
- Understand disaster risks in India

UNIT -I

Understanding Disaster: Concept of Disaster - Different approaches - Concept of Risk - Levels of Disasters - Disaster Phenomena and Events (Global, national and regional).

Hazards and Vulnerability: Natural and man-made hazards; response time, frequency and forewarning levels of different hazards - Characteristics and damage potential or natural hazards; hazard assessment - Dimensions of vulnerability factors; vulnerability assessment - Vulnerability and disaster risk - Vulnerabilities to flood and earthquake hazards, Precautions and Alarming of people.

UNIT-II

Disaster Management Mechanism: Concepts of risk management and crisis managements - Disaster Management Cycle - Response and Recovery - Development, Prevention, Mitigation and Preparedness - Planning for Relief Methods of Rehabilitation.

UNIT-III

Capacity Building: Capacity Building: Concept - Structural and Nonstructural Measures - Capacity Assessment; - Strengthening Capacity for Reducing Risk - Counter-Disaster Resources and their utility in Disaster Management - Legislative Support at the state and national levels.

UNIT-IV

Coping with Disaster: Coping Strategies; alternative adjustment processes - Changing Concepts of disaster management - Industrial Safety Plan; Safety norms and survival kits - Mass media and disaster management.

UNIT-V

Planning for disaster management: Strategies for disaster management planning - Steps for formulating a disaster risk reduction plan – Forming management teams and their responsibilities - Disaster management Act and Policy in India - Organizational structure for disaster management in India - Preparation of state and district disaster management plans.

Text Books

1. Alexander, D., "Natural Disasters", ULC press Ltd, London, 1993.
2. Carter, W.N., "Disaster Management: A Disaster Management Handbook", Asian Development Bank, Bangkok, 1991.
3. Manual on Natural Disaster Management in India, NCDM, New Delhi, 2001.

References

1. Abarquez I. & Murshed Z., "Community Based Disaster Risk Management: Field Practitioner's Handbook", ADPC, Bangkok, 2004.
2. Goudie, A., "Geomorphological Techniques", Unwin Hyman, London 1990.
3. Goswami, S.C, "Remote Sensing Application in North East India", Purbanchal Prakesh, Guwahati, 1997.
4. Chakrabarty, "U.K. Industrial Disaster Management and Emergency Response", Asian Book Pvt. Ltd., New Delhi 2007.
5. Disaster Management in India, Ministry of Home Affairs, Government of India, New Delhi, 2011.
6. National Policy on Disaster Management, NDMA, New Delhi, 2009
7. Disaster Management Act. (2005), Ministry of Home Affairs, Government of India, New Delhi, 2005.
8. District Disaster Management Plan-Model Template, NIDM, New Delhi, 2005.
9. Disaster Management, Future challenge and opportunities, Edited by Jagbir singh, I.K. International publishing home Pvt, Ltd.

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of disaster Management
- Understand the vulnerability of ecosystem and infrastructure due to a disaster
- Acquire the knowledge of Disaster Management Phases
- Understand the hazard and vulnerability profile of India

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9128) FOUNDATION ENGINEERING
(PROFESSIONAL ELECTIVE-II)

III Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Geotechnical Engineering

Course Objectives

Student will be able to

- Create ability to solve foundation engineering design and problems associated.
- Develop an understanding of sampling techniques in soils.
- Understand the impact of engineering solutions related to the ground stability.
- Determine the bearing capacity for the design of shallow and deep foundations.

UNIT – I

SOIL EXPLORATION: Need – methods of soil exploration – boring and sampling methods – penetration tests – plate load test – pressure meter – planning of soil exploration programme and preparation of soil investigation report.

UNIT – II

SLOPE STABILITY: Infinite and finite earth slopes – types of failures – factor of safety of infinite slopes – stability analysis by Swedish slip circle method, method of slices, Bishop's Simplified method of slices – Taylor's Stability Number- stability of slopes of earth dams under different conditions.

UNIT – III

EARTH PRESSURE THEORIES: Rankine's theory of earth pressure – earth pressures in layered soils – Coulomb's earth pressure theory – Culmann's graphical method.

RETAINING WALLS: Types of retaining walls – stability of retaining walls against overturning, sliding, bearing capacity and drainage from backfill, introduction to reinforced earth walls.

UNIT –IV

SHALLOW FOUNDATIONS - Types - choice of foundation – location and depth - safe bearing capacity – shear criteria – Terzaghi's, Meyerhof's, Skempton's and IS code methods. settlement criteria – allowable bearing pressure based on SPT N value and plate load test – computation of immediate and consolidation settlement – allowable settlements of structures – presumptive bearing capacities from national building code.

UNIT -V

PILE FOUNDATION: Types of piles – load carrying capacity of piles based on static pile formulae – dynamic pile formulae – pile load tests - load carrying capacity of pile groups in sands and clays – Settlement of pile groups – negative skin friction - introduction to laterally loaded piles.

WELL FOUNDATIONS: Types – different shapes of wells – forces on wells - components of wells – functions and design criteria – sinking of wells – tilts and shifts.

Text books:

1 Basic and Applied Soil Mechanics by Gopal Ranjan & ASR Rao, New age International Pvt . Ltd, New Delhi
2. Principals of Geotechnical Engineering by Braja M.Das, Cengage Learning Publishers.
3. Soil Mechanics and Foundation Engineering by VNS Murthy, CBS Publishers and Distributors.

References:

1. Geotechnical Engineering Principles and Practices by Cuduto, PHI Intrernational.
2. Analysis and Design of Substructures – Swami Saran, Oxford and IBH Publishing company Pvt Ltd (1998).
3. Geotechnical Engineering by S. K.Gulhati & Manoj Datta – Tata Mc.Graw Hill Publishing company New Delhi. 2005.
4. . Bowles, J.E., (1988) Foundation Analysis and Design – 4th Edition, McGraw-Hill Publishing company, Newyork.

Course Objectives

After completion of this course, student should be able to

- Calculate the bearing capacity of soils and foundation settlements
- Understand soil exploration methods
- Determine the earth pressures on foundations and retaining structures
- Analyze shallow and deep foundations

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9129) ELEMENTS OF EARTHQUAKE ENGINEERING
(PROFESSIONAL ELECTIVE-II)

III Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : None

Course Objectives

Student will be able to

- Understand Engineering Seismology
- Explain and discuss single degree of freedom systems subjected to free and forced vibrations
- Acquire the knowledge of the conceptual design and principles of earthquake resistant designs as per IS codes
- understand importance of ductile detailing of RC structures
- Understand the behavior of masonry buildings

UNIT I

Engineering Seismology: Earthquake phenomenon cause of earthquakes-Faults- Plate tectonics- Seismic waves- Terms associated with earthquakes-Magnitude/Intensity of an earthquake-scales-Energy released-Earthquake measuring instruments-Seismoscope, Seismograph, accelerograph-strong ground motions- Seismic zones of India.

Theory of Vibrations: Elements of a vibratory system- Degrees of Freedom-Continuous system-Lumped mass idealization-Oscillatory motion-Simple Harmonic Motion-Free vibration of single degree of freedom (SDOF) system- undamped and damped-critical damping-Logarithmic decrement-Forced vibrations-Harmonic excitation-Dynamic magnification factor-Excitation by rigid based translation for SDOF system-Earthquake ground motion.

UNIT II

Conceptual design: Introduction-Functional planning-Continuous load path-Overall form-simplicity and symmetry-elongated shapes-stiffness and strength-Horizontal and Vertical members-Twisting of buildings-Ductility-definition-ductility relationships-flexible buildings-framing systems-choice of construction materials-unconfined concrete-confined concrete-masonry-reinforcing steel.

Introduction to earthquake resistant design: Seismic design requirements-regular and irregular configurations-basic assumptions-design earthquake loads-basic load combinations-permissible stresses-seismic methods of analysis-factors in seismic analysis-equivalent lateral force method.

UNIT III

Reinforced Concrete Buildings: Principles of earthquake resistant deign of RC members-Structural models for frame buildings- Seismic methods of analysis- Seismic deign methods-IS code based methods for seismic design- Response Spectrum Method – Seismic Coefficient method - Seismic evaluation and retrofitting- Vertical irregularities- Plan configuration problems- Lateral load resisting systems- Determination of design lateral forces- Equivalent lateral force procedure- Lateral distribution of base shear.

UNIT IV

Masonry Buildings: Introduction- Elastic properties of masonry assemblage- Categories of masonry buildings- Behaviour of unreinforced and reinforced masonry walls- Behaviour of walls- Box action and bands- Behaviour of infill walls- Improving seismic behaviour of masonry buildings- Load combinations and permissible stresses- Seismic design requirements- Lateral load analysis of masonry buildings.

UNIT V

Structural Walls and Non-Structural Elements: Strategies in the location of structural walls- sectional shapes- variations in elevation- cantilever walls without openings – Failure mechanism of non-structures- Effects of non-structural elements on structural system- Analysis of non-structural elements- Prevention of non-structural damage- Isolation of non-structures. Ductility Considerations in Earthquake Resistant Design of RC Buildings: Introduction- Impact of Ductility- Requirements for Ductility- Assessment of Ductility- Factors affecting Ductility- Ductile detailing considerations as per IS 13920. Behaviour of beams, columns and joints in RC buildings during earthquakes-Vulnerability of open ground storey and short columns during earthquakes.

Text Books:

1. Earthquake Resistant Design of structures – S. K. Duggal, Oxford University Press
2. Earthquake Resistant Design of structures – Pankaj Agarwal and Manish Shrikhande, Prentice Hall of India Pvt. Ltd.

References:

1. Seismic Design of Reinforced Concrete and Masonry Building – T. Paulay and M.J.N. Priestly, John Wiley & Sons.
2. Eartquake Resistant Design of Buidling structures by Vinod Hosur, Wiley India Pvt. Ltd.
3. Elements of Mechanical Vibration by R.N.Iyengar, I.K.International Publishing House Pvt. Ltd.
4. Masory and Timber structures including earthquake Resistant Design –Anand S.Arya, Nem chand & Bros
5. Earthquake Tips – Learning Earthquake Design and Construction - C.V.R. Murthy

Reference Codes:

1. IS: 1893 (Part-1) -2002. "Criteria for Earthquake Resistant – Design of structures." B.I.S., New Delhi.
2. IS:4326-1993, " Earthquake Resistant Design and Construction of Building", Code of Practice B.I.S., New Delhi.
3. IS:13920-1993, " Ductile detailing of concrete structures subjected to seismic force" – Guidelines, B.I.S., New Delhi.

Course Outcomes:

After completion of this course, student should be able to

- Discuss and explain causes and Theories on earthquake, seismic waves, measurement of earthquakes
- Evaluate base shear using IS methods
- Design and Detail the reinforcement for earthquake forces
- Analyze masonry buildings
- Analyze non-structural elements

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9130) ADVANCED DESIGN OF RCC STRUCTURES
(PROFESSIONAL ELECTIVE-II)

III Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites: Design of RC Structures

Objectives :

This course will develop students' knowledge in/on

1: Design of Flat slab and grid slab.
2: Behavior of retaining walls.
3: The behavior of water retaining structures.
4: The design of different types of foundations, Bunkers & Silos.

Unit – I

Grid Slabs: Introduction, Proportioning of grids dimensions, Design of grid slabs.
Flat Slab: Introduction, Design of Flat Slab

Unit – II

Cantilever Retaining wall: Introduction, Types of reinforced walls, Theories of earth pressure, Rankine's earth pressure theory, Columb's earth pressure theory, Design of cantilever retaining wall.
Counter fort Retaining wall: Behavior of counter fort retaining wall, Design of counter fort retaining wall.

Unit – III

Underground Water Tank: Introduction, Design requirements as per IS 3370 – 1965, Design principles of underground rectangular and circular water tank as per IS provisions.
Elevated Water Tank: Design of elevated circular water tank with staging.

Unit – IV

Intz Tank: Introduction, Elements of Intz tank, Design of top dome, Design of top ring beam, Design of bottom dome, Design of bottom ring beam and Design of conical bottom.
Foundations: Design of raft foundation, Design of strip footings, Effective length of pile, Reinforcement in piles, under reamed piles, Pile cap, Grade beams, Design of pile foundation.

Unit – V

Design of RCC Chimneys Bunkers & Silos

Text Books:

1. B.C. Punmia, "Reinforced Concrete Structures, Vol. I, II, III & IV", Laxmi Publishing Company.
2. Krishna Raju, "Advanced Reinforced Concrete Structures,Tata McGrawHill Book Education Pvt Ltd.

Reference Books:

1. N.Subramanian,"Design of Reinforced Concrete Structures", Oxford Higher Education, New Delhi.
2. P.C.Varghese,"Advanced Reinforced Concrete Design", PHI Publications, 2nd edition.
3. S. Unnikrishna Pillai and Devdas Menon, "Reinforced Concrete Design", Tata Mc.Graw-Hill Publishing Company Limited, New Delhi.
4. IS 456, "Code of practice for Plain and reinforced concrete", Bureau of Indian standards, New Delhi, 2000.
5. IS 875(part 1-5), "Code of practice for Design loads", Bureau of Indian standards, New Delhi, 1987.
6. IS 3370, "Code for water tanks (Parts I, II, III and IV)", Bureau of Indian Standards, New Delhi, 1965.

Outcomes:

After completion of this course, students will be able to

- Design and detail Flat slab and grid slab.
- Design and detail different types of earth retaining walls.
- Design and detail different types of water retaining structures.
- Design and detail different types of different types of foundations, Bunker and Silos.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9024) TECHNICAL COMMUNICATION SKILLS LAB

III Year B. Tech. II-SEM CIVIL, ECE

L	T	P	C
0	0	3	2

Pre Requisite: None

1. Introduction

The introduction of the Technical Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

2. Course Objectives:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

Course Outcomes

- Developing sound vocabulary and its proper use contextually.
- Inculcating flair for Writing and felicity in written expression.
- Enhancing job prospects.
- Acquiring effective speaking abilities

3. Syllabus:

The following course content to conduct the activities is prescribed for the Technical Communication Skills (TCS) Lab:

1. **Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations and Discourse Skills- using visuals -

Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations and usage of vocabulary.

2. **Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.
3. **Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/ Technical report writing/ Portfolio writing* – planning for writing – improving one's writing.
4. **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/**PPTs** and written presentations through posters/projects/reports/ e-mails/assignments etc.
5. **Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference and video-conference and Mock Interviews.

4. Minimum Requirement:

The Technical Communication Skills (TCS) Laboratory shall have the following infra-structural facilities to accommodate at least 35 students in the lab:

- Spacious room with appropriate acoustics
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality

5. Prescribed Lab Manual: A book titled ***A Course Book of Advanced Communication Skills (ACS) Lab*** published by Universities Press, Hyderabad.

6. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

- **Oxford Advanced Learner's Compass**, 8th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE** (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
  - **Preparing for being Interviewed**
  - **Positive Thinking**
  - **Interviewing Skills**
  - **Telephone Skills**
  - **Time Management**
  - **Skillmate**
  - **Presentation skills, Cambridge** (with VCD)

7. Books Prescribed:

1. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
3. **Advanced Communication Skills Laboratory Manual** by Sudha Rani, D, Pearson Education 2011.
4. **Technical Communication** by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
5. **Business and Professional Communication:** Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.

Suggested Books:

1. **The Basics of Communication: A Relational Perspective**. Steve Duck & David T. McMahan. Sage South Asia Edition. Sage Publications. 2012.
2. **English Vocabulary in Use** series, Cambridge University Press 2008.
3. **Management Shapers Series** by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
4. **Handbook for Technical Communication** by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
5. **Communication Skills** by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
6. **Handbook for Technical Writing** by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
7. **Job Hunting** by Colm Downes, Cambridge University Press 2008.
8. **Master Public Speaking** by Anne Nicholls, JAICO Publishing House, 2006.
9. **English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.**
10. Books on **TOEFL/GRE/GMAT/CAT/ IELTS** by Barron's/DELTA/Cambridge University Press.
11. **International English for Call Centres** by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.
12. **Towards Career Advancement** - Excerpts from a Professor's Folio by **P. Satyanarayana Prof. of English, Vaagdevi College of Engineering** , published by Vaagdevi Group of Colleges Engineering , Warangal (T.S.) India, 2015.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

STRUCTURAL DETAILING LAB - STEEL

III Year B.Tech. Civil Engg. II-Sem	**L**	**T**	**P**	**C**
	0	**0**	**3**	**2**

Course Objectives

Student will be able to

- Analyze the detailing of bolted and welded connections.
- Analyze the detailing of tension and compression members.
- Analyze the detailing of beam and built-up sections.
- Analyze the detailing of plate girder and roof trusses.

LIST OF EXERCISES

1. Detailing of Steel bolted connections.
2. Detailing of welded connections.
3. Detailing of tension members.
4. Detailing of steel compression members
5. Detailing of beam sections.
6. Detailing of steel beams-built-up sections.
7. Detailing of eccentric connections.
8. Detailing of steel plate girder.
9. Detailing of web slice and flange splice.
10. Detailing of roof trusses

Course Outcomes:

After completion of this course, student should be able to

- Understand the detailing of bolted and welded connections.
- Understand the detailing of tension and compression members.
- Understand the detailing of beam and built-up sections.
- Understand the detailing of plate girder and roof trusses.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9132) GEOTECHNICAL ENGINEERING LAB

III Year B.Tech. Civil Engg. II-Sem

L	T	P	C
0	0	3	2

Pre Requisites : Geotechnical Engineering

Course Objectives:

Student will be able to

- Introduce traditional program consisting mostly of practical courses related to geotechnical engineering.
- Apply the knowledge of science, mathematics and engineering with the context of applications in geotechnical engineering.
- Design and conduct experiments, analyze and interpret data related to the various laboratory tests studied in geotechnical engineering.

LIST OF EXPERIMENTS

1. Atterberg Limits (Liquid Limit, Plastic Limit)
2. Field density
3. Determination of Specific gravity of soil.
4. Grain size distribution by sieve analysis
5. Permeability of soil by constant and variable head test methods
6. Standard Proctor's Compaction Test
7. California Bearing Ratio Test (CBR Test)
8. Determination of Coefficient of consolidation
9. Unconfined compression test
10. Direct shear test
11. Vane shear test
12. Tri-axial compression test

Reference Book

Measurement of Engineering Properties of Soils by. E. Saibaba Reddy & K. Rama Sastri, New Age International.

Course Outcomes:

After completion of this course, student should be able to

- Determine index properties of soils.
- Classify soils.
- Determine engineering properties of soil.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9133) ESTIMATING & COSTING

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
4	0	0	4

Pre Requisites : None

Course Objectives:

Student will be able to

- Understands the terms of estimation.
- Calculate detailed estimate of buildings and earthwork.
- Do rate analysis of quantities
- Understand the types of contracts and methods of valuating the property

UNIT – I

General items of work in Building – Standard Units Principles of working out quantities for detailed and abstract estimates – Approximate method of Estimating – types of estimate – powers of sanctions.

UNIT – II

Detailed Estimates of Buildings - Bar bending schedules for beams and slabs

UNIT – III

Earthwork for roads and canals – drawing L.S. of roads and canals.

UNIT – IV

Rate Analysis – Working out data for various items of work over head and contingent charges. - Standard specifications for different items of building construction.

UNIT-V

Tenders – calling of tenders – submission of tenders – evaluation of tenders – measurement books - Contracts – Types of contracts – Contract Documents – Conditions of contract, Valuation and rental calculation.

Text Books

1. Estimating and Costing by B.N. Dutta, UBS publishers, 2000.
2. Estimating and Costing by G.S. Birdie

Reference books :

1. Standard Schedule of rates and standard data book by public works department.
2. I.S. 1200 (Parts I to XXV–1974/ method of measurement of building and Civil Engineering works – B.I.S.)
3. Estimation, Costing and Specifications by M. Chakraborthi; Laxmi publications.

Course Outcomes:

After completion of this course, student should be able to

- Evaluate the detailed estimate of RC building
- Evaluate the detailed estimate of roads and irrigation works
- Understands the importance of valuation
- Understands what type of contract is used for a specific Work

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9134) ENVIRONMENTAL ENGINEERING

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Engineering Chemistry

Course Objectives:

Student will be able to

- Understanding of sources of water and water supply
- Understanding of Distribution of water
- Understanding of characteristics of sewage
- Understanding of waste water treatment process

UNIT – I

Introduction : Waterborne diseases – protected water supply – Population forecasts, design period – types of water demand – factors affecting – fluctuations – fire demand – water quality and testing – drinking water standards: sources of water - Comparison from quality and quantity and other considerations – intakes – infiltration galleries .

UNIT II

Layout and general outline of water treatment units – sedimentation – principles – design factors – coagulation-flocculation clarifier design – coagulants - feeding arrangements. Filtration – theory – working of slow and rapid gravity filters – multimedia filters – design of filters – troubles in operation - comparison of filters – disinfection – theory of chlorination, chlorine demand - other disinfection practices- Miscellaneous treatment methods.

UNIT-III

Distribution systems requirement –method and layouts -Design procedures- Hardy Cross and equivalent pipe methods pipe – joints, valves such as sluice valves, air valves, scour valves and check valves water meters – laying and testing of pipe lines – pump house - Conservancy and water carriage systems – sewage and storm water estimation – time of concentration – storm water overflows combined flow

UNIT - IV

characteristics of sewage – cycles of decay – decomposition of sewage, examination of sewage – B.O.D. Equation – C.O.D. Design of sewers – shapes and materials – sewer appurtenances manholes – inverted siphon – catch basins – flushing tanks – ejectors, pumps and pumphouses – house drainage – components requirements – sanitary fittings-traps – one pipe and two pipe systems of plumbing **–** ultimate disposal of sewage – sewage farming – dilution.

UNIT – V

Waste water treatment plant – Flow diagram - primary treatment Design of screens – grit chambers – skimming tanks – sedimentation tanks – principles of design – Biological treatment – trickling filters – standard and high rate – Construction and design of oxidation ponds. Sludge digestion – factors effecting – design of Digestion tank – Sludge disposal by drying – septic tanks working principles and design – soak pits.

TEXT BOOKS :

1. Water supply and sanitary Engineering by G.S. Birdi, Dhanpat Rai & Sons Publishers.
2. Water Supply & Environmental Engineering by A.K. Chatterjee.
3. Water and Waste Water Technology by Mark J Hammar and Mark J.Hammar Jr.

REFERENCE BOOKS :

1. Water and Waste Water Technology by Steel
2. Water and Waste Water Engineering by Fair Geyer and Okun
3. Text book of Environmental Engineering by P. Venugopal Rao (PHI)
4. Waste water Engineering by Metcalf and Eddy.
5. Unit operations in Environmental Engineering by R. Elangovan and M.K. Sasutharam (Newage)

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of the water borne diseases
- Acquire the knowledge of water distribution system
- Design sewers
- Develop skills in designing the water treatment plant.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9135) PRESTRESSED CONCRETE
(PROFESSIONAL ELECTIVE-III)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Design of RC Structures

Course Objectives:

Student will be able to

- Develop an understanding of the necessity of prestressed concrete structures.
- Develop an understanding of various techniques of prestressing.
- Develop an understanding of various losses of prestress.
- Develop an understanding of the analysis of prestressed concrete members.

UNIT I:

Introduction: Historic development- General principles of prestressing pretensioning and post tensioning- Advantages and limitations of Prestressed concrete- General principles of PSC- Classification and types of prestressing- Materials- high strength concrete and high tensile steel their characteristics.

UNIT II:

Methods and Systems of prestressing: Pretensioning and Posttensioning methods and systems of prestressing like Hoyer system, Magnel Blaton system, Freyssinet system and Gifford- Udall System- Lee McCall system.

Flexure: Analysis of sections for flexure- beams prestressed with straight, concentric, eccentric, bent and parabolic tendons- stress diagrams- Elastic design of PSC slabs and beams of rectangular and I sections- Kern line – Cable profile and cable layout.

UNIT III:

Losses of Prestress: Loss of prestress in pretensioned and posttesnioned members due to various causes like elastic shortening of concrete, shrinkage of concrete, creep of concrete, relaxation of stress in steel, slip in anchorage, frictional losses.

Shear: General Considerations- Principal tension and compression- Improving shear resistance of concrete by horizontal and vertical prestressing and by using inclined or parabolic cables- Analysis of rectangular and I beams for shear – Design of shear reinforcements- IS Code provisions**.**

UNIT IV:

Transfer of Prestress in Pretensioned Members : Transmission of prestressing force by bond – Transmission length – Flexural bond stresses – IS code provisions – Anchorage zone stresses in post tensioned members – stress distribution in End block – Analysis by IS methods – Anchorage zone reinforcement- IS Provisions

UNIT V

Composite Beams: Different Types- Propped and Unpropped- stress distribution- Differential shrinkage- Analysis of composite beams- General design considerations.

Deflections: Importance of control of deflections- Factors influencing deflections – Short term deflections of uncracked beams- prediction of long time deflections- IS code requirements.

TEXT BOOKS :

1. Prestressed concrete by Krishna Raju, Tata Mc Graw Hill Book – Co. New Delhi.
2. Design of prestress concrete structures by T.Y. Lin and Burn, John Wiley, New York.
3. Prestressed concrete by S. Ramamrutham Dhanpat Rai & Sons, Delhi.
4. Prestressed Concrete by N. Rajagopalan Narosa Publishing House
5. Relevant IS Codes.

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of evolution of process of prestressing.
- Acquire the knowledge of various prestressing techniques.
- Develop skills in analysis of prestressed concrete beams and slabs.
- Develop skills to satisfy the serviceability and strength provisions of the Indian Standards (IS: 1343-2012).

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9136) GROUND IMPROVEMENT TECHNIQUES
(PROFESSIONAL ELECTIVE-III)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Geotechnical Engineering

Course Objectives:

Student will be able to

- Learn and understand various ground improvement technique.
- Learn various methods of compaction for ground improvement in its strength.
- Learn various physical and chemical modification for ground improvement

Unit. I

Introduction to Engineering Ground Modification: Need and objectives, Identification of soil types, In situ and laboratory tests to characterise problematic soils; Mechanical, Hydraulic, Physico-chemical, Electrical, Thermal methods, etc. and their applications.

Unit. II

Mechanical Modification – Principles of soil densification – Properties of Compacted soil, Compaction control tests, Specification of compaction requirements, Blasting Vibrocompaction, Dynamic Tamping and Compaction piles.

Unit. III

Hydraulic Modification – Objectives and techniques, traditional dewatering methods and their choice, Design of dewatering system, Electro-osmosis, Filtration, Drainage and seepage control with Geosynthetics, Preloading and vertical drains, Electro-kinetic dewatering.

Unit. IV

Physical and Chemical Modification – Modification by admixtures, Shotcreting and Guniting Technology, Modification at depth by grouting, Crack Grouting and compaction grouting, Jet grouting, Thermal Modification, Ground freezing.

Unit. V

Modification by Inclusions and Confinement - Soil reinforcement, reinforcement with strip, bar, mesh, sheet and grid reinforced soil. In-situ ground reinforcement, ground anchors, rock bolting and soil nailing.

Text Books:

1. Hausmann, M. R. (1990) – Engineering Principles of Ground Modifications, McGraw Hill publications
2. Mosley – Ground Improvement

References:

1. Koerner, R. M (1994) – Designing with Geosynthetics – Prentice Hall, New Jersey
2. Jones C. J. F. P. (1985) – Earth Reinforcement and soil structures – Butterworths, London.
3. Xianthakos, Abreimson and Bruce - Ground Control and Improvement

Course Outcomes:

After completion of this course, student should be able to

- Select the ground improvement technique which is suitable and economical for soil strengthening.
- Select different techniques based on the various types of soils in-situ.
- Design reinforced earth structures**.**
- Apply the knowledge of geo-synthetic material for usage.
- Apply the knowledge of modification by confinement.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9137) SOLID WASTE MANAGEMENT
(PROFESSIONAL ELECTIVE-III)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : None
Course Objectives:

Student will be able to

- Develop an understanding the necessity of solid waste management
- Develop an understanding of the collection of solid waste
- Develop an understanding of solid waste disposal methods
- Develop an understanding of bio medical waste management
- Develop an understanding of e-waste management

UNIT – I Introduction
Solid Waste problem, Meaning and definition of solid waste, concept and classification of municipal solid waste, Impacts of solid waste on environment, Solid waste management rules and regulations.

UNIT – II
Collection and Transfer of Municipal Solid Waste
Developing a solid waste collection and transfer system characterizing waste generation, determining public and private collection/transfer options.

UNIT – III
Solid Waste management techniques
Solid waste management Hierarchy, waste avoidance /waste prevention, Definition of source Reduction, waste reduction at source using 5R's Technique.

UNIT – IV
Waste Disposal Techniques
Introduction, composting, principles of composting, factors affecting composting, vermi composting, waste to energy techniques, Landfill technique, and design and operating procedure of landfill.

UNIT – V
Solid waste management of Biomedical Waste, plastic and E- Waste
Biomedical Waste – Sources and generation, biomedical waste management. Plastic– Dangers of plastic wastes, Recycling and disposal of plastic wastes. E-Wastes – Definition, Health hazards, E-Waste management and conclusion.

TEXT BOOKS

1. Solid waste management by K. Sasi Kumar & S. Gopi Krishna
2. Integrated Solid Waste Management, Tchobanoglous, Theissen & Vigil. McGraw Hill Publication

Course Outcomes:

After completion of this course, students should be able to

- Acquire the knowledge of solid waste management
- Explain solid waste disposal techniques
- Acquire the knowledge of Bio medical waste disposal techniques
- Acquire the knowledge of e- waste disposal techniques

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9138) WATERSHED MANAGEMENT
(PROFESSIONAL ELECTIVE-IV)

IV B.Tech. Civil Engg. I Sem

L	T	P	C
3	1	0	3

Pre Requisites : None

Course Objectives:

Student will be able to

- Develop an understanding of the processes and fluxes of mass and energy within a watershed and how land use changes potentially affect these processes.
- Learn how science-based management principles may be applied to watershed systems.
- Develop/improve critical problem solving, quantitative and data analysis skills commonly used by natural resource managers.
- Understand potential environmental effects of various land and water uses and how these resources can benefit from integrated watershed management.

UNIT-I

INTRODUCTION: Concept of watershed development, objectives of watershed development, need for watershed development in India, Integrated and multidisciplinary approach for watershed management.

CHARACTERISTICS OF WATERSHED: size, shape, physiography, slope, climate, drainage, land use, vegetation, geology and soils, hydrology and hydrogeology, socio-economic characteristics, basic data on watersheds.

Watershed delineation – Runoff Computations from a watershed – Flood Frequency Analysis – Gumbell, Log Pearson and Weibull Methods of Analysis.

UNIT-II

PRINCIPLES OF EROSION: Types of erosion, factors affecting erosion, effects of erosion on land fertility and land capability, estimation of soil loss due to erosion, Universal soil loss equation.

MEASURES TO CONTROL EROSION: Contour techniques, ploughing, furrowing, trenching, bunding, terracing, gully control, rockfill dams, brushwood dam, Gabion.

UNIT-III

WATER HARVESTING: Rainwater Harvesting, catchment harvesting, harvesting structures, soil moisture conservation, check dams, artificial recharge, farm ponds, percolation tanks.

UNIT-IV

FOREST AND GRASS LAND MANAGEMENT: Interpretation of Satellite Imageries-Land use and Land Cover. Land capability classification, management of forest, agricultural, grassland and wild land. Reclamation of saline and alkaline soils.

UNIT-V

ECOSYSTEM MANAGEMENT: Role of Ecosystem, crop husbandry, soil enrichment, inter, mixed and strip cropping, cropping pattern, sustainable agriculture, bio-mass management, dry land agriculture, Silvi pasture, horticulture, social forestry and afforestation.

Planning of watershed management activities, peoples participation, preparation of action plan, administrative requirements- Reservoir Routing..

Text books:

1. Watershed Management by JVS Murthy, - New Age International Publishers.
2. Soil and Water Conservation Practices by Suresh Rao, Standard Publishers, 1998
3. Water Resource Engineering by R.Awurbs and WP James, - Prentice Hall Publishers.

References:

1. Land and Water Management by VVN Murthy, - Kalyani Publications.
2. Irrigation and Water Management by D.K.Majumdar, Printice Hall of India
3. Water Resources Conservation and Management by Chatterjee, S. N. Atlantic Publishers, 2008.

Course Outcomes:

After completion of this course, student should be able to

- Comprehend the physical, biological and environmental aspects and their interrelations within a watershed; choose and apply available system tools for system intervention.
- Explain the participatory decision making processes; comprehend the interdependencies between natural resources and management at different locations in land and water management.
- Formulate a vision and design a sustainable watershed management plan that shows an integrated approach towards multiple use of land- and water resources and social equity and economic viability.
- Work in multidisciplinary and multicultural groups (with respect for different views, expertise and culture); reflect on own contribution to group work and on group processes.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9139) TRANSPORTATION ENGINEERING
(PROFESSIONAL ELECTIVE-IV)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Highway Engineering

Course Objectives

Student will be able to

- Know about railway planning and design
- Study railway track construction maintenance and operation
- Study different modes of transport
- Know about the fundamentals of airways
- Know about the fundamentals of port and harbor
- Know the different components of harbor

UNIT – I

INTRODUCTION TO RAILWAY

Permanent way components – Cross Section of Permanent Way - Functions of various Components like Rails, Sleepers and Ballast, Gauge –Creep of Rails- Theories related to Creep – Sleeper density.

UNIT – II

GEOMETRIC DESIGN OF RAILWAY TRACK: Gradients- Grade Compensation- Cant and Negative Super elevation- Cant Deficiency – Degree of Curve, Points and Crossing, Rail Joints & Welding of Joints, Railway station& Yards, Signalizing & interlocking.

UNIT – III

AIRPORT ENGINEERING:

Airport Site selection – Runway Orientation – Basic Runway Length – Corrections for Elevation, Temperature – Airport Classification - Runway Geometric design – Factors Controlling Taxiway Layout - Terminal Area – Apron – Hangar – Blast Considerations, Typical Airport Layouts – Wind rose diagram - Runway Lightening system & Marking.

UNIT – IV

PORT AND HARBOUR ENGINEERING:

Requirements of Port and Harbour, Classification of Port & Harbour, Features of a Harbour, Planning of Harbour, Breakwaters, Dry docks, Jetties, Aprons, Transit shed and Warehouses, Navigational aids, Maintenance of Port and Harbours, Inland Water Transport

UNIT –V

INTELLIGENT TRANSPORT SYSTEMS:

ITS Definition, Benefits of ITS, user services, Detectors, Automatic Vehicle Location (AVL), Automatic Vehicle Identification (AVI), Introduction to ITS applications; Advanced Traffic Management systems (ATMS), Advanced Public Transportation systems (APTS), ITS architecture components and standards, Overview of ITS implementations in developed countries.

Text books:

1. Satish Chandra and Agarwal, M.M. (2007) "Railway Engineering" Oxford Higher Education, University Press New Delhi.
2. Airport Planning and Design- S.K. Khanna and M.G Arora, Nemchand Bros.
3. A Text book of Transportation Engineering – S.P.Chandola – S.Chand & Co. Ltd. – (2001).
4. Transportation Engineering and Planning – C.S. Papacostas, P.D.Prevedouros
5. Relevant Codes.

References:

1. A Text Book of Railway Engineering-S.C.Saxena and S.Arora, Dhanpatrai and Sons, New Delhi.
2. Highway, railway, Airport and Harbour Engineering – K.P. Subramanian
3. Harbour, Dock and Tunnel Engineering – R. Srinivasan
4. Dock and Harbour Engineering – Hasmukh P Oza, Gutam H Oza

Course Objectives

After completion of this course, student should be able to

- Explain railway track components, its importance and requirements.
- Design elements of track geometry, points and crossings and concepts of railway signaling
- Elaborate on air–craft characteristics, site selection and perform corrections in runway length design.
- Predict the importance and necessity of harbors and docks in transportation.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9140) BRIDGE ENGINEERING
(PROFESSIONAL ELECTIVE-IV)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Design of RC Structures, Design of Steel Structures

Course Objectives

Student will be able to

- Basics of bridges and design loads.
- Analyze and design Deck Slab and T Beam bridge
- Plate girder and Truss bridge.
- Design of bridge bearings, piers and abutments.

UNIT-I

Fundamentals of Bridges: Importance of bridges, Classification of bridges, Components, economic spans, Factors effecting types of bridge-natural and economic considerations, Linear water ways and afflux.

Design loads: IRC standard loading, Impact factors, Wind loading, Seismic forces, Longitudinal forces, Centrifugal forces, Buoyancy forces, Thermal forces, Erection stresses, Temperature effects, Standards for railway loading

UNIT-II

Deck Slab Bridge: Design of Reinforced Cement Concrete deck Slab Bridge, Analysis and design of Slab culvert as per IRC loading, Analysis and Design of Box Culvert.

T- Beam Bridges:

General features, Introduction to Westergaard's analysis, Design of interior panel slab, Courbon's method of analysis for design of longitudinal and cross girders.

UNIT-III

Plate Girder Bridge: Components of plate Girder Bridge, Design of plate girder bridge for railway loading.

Steel Truss Bridge: Types of Trusses, General and design features, Design of steel truss bridge as per IRC loading.

UNIT-IV

Bridge Bearings: Types of bearing, forces on bearing, Design of elastomeric bearings, Types of expansion joints.

Pier and Abutments: Types of piers and abutments, Forces acting, Stability analysis and design.

UNIT – V

Bridge Inspection and Maintenance: Inspection of Bridges, Maintenances of Bridges, Rehabilitation, Current design and construction Practice.

Text Books:

1. N. Krishna Raju, "Design of Bridges", Oxford and IBH Publishing Company Pvt. Ltd.
2. T.R. Jagadeesh and M.A. Jayaram "Design of Bridge Structures", PHI Learning Pvt. Ltd, New Delhi.

Reference Books:

1. Victor DJ., Essentials of Bridge Engineering , Oxford and IBH Publishing Company Pvt. Ltd.
2. B.C. Punmia, Design of Reinforced Concrete Strctures, Vol. II, Laxmi Publishers, New Delhi.
3. Ram Chandra, Design of Steel Structures, Vol. II, Standard book house, New Delhi.
4. IRC 5, 6 and 7, "Code of Practice for Design of Bridges", Indian Road Congress, New Delhi.
5. IS: 800-1984: "Code of practice for steel construction", Bureau of Indian Standards, New Delhi.
6. IS: 456-2000: "Code of practice for Plain and Reinforced Concrete", Bureau of Indian Standards, New Delhi.

Course Outcomes :

After completion of this course, students will be able to

- Classify bridges and loads acting on them.
- Design Deck slab and T-beam bridges.
- Design Plate Girder Bridge and Steel Truss Bridge.
- Design bridge bearings, piers and abutments.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9141) REHABILITATION & RETROFITTING OF STRUCTURES
(PROFESSIONAL ELECTIVE-V)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Concrete Technology

Course Objectives:

Students will be able to:

- Know about Distress and damages of structures.
- Know about inspection and testing of structures.
- Know about Corrosion in Reinforcement.
- Know about Repairs of Structures.
- Know about health monitoring of structures.

UNIT – I

Introduction - Deterioration of Structures - Distress in the Structures - Causes and Prevention. Mechanism of Damage - Types of Damage.

UNIT – II

Inspection and Testing - Symptoms and Diagnosis of Distress - Damage Assessment - Non-Destructive Testing(NDT).

UNIT – III

Corrosion of Steel Reinforcement – Causes - Mechanism and Prevention. Damage of Structure due to Fire - Fire rating of Structure -, Phenomena of Desiccation.

UNIT – IV

Repair of Structure - Common types of Repair - Repair in Concrete Structures - Repair in Under water Structures – Guniting - Shot Create – Underpinning.
Strengthening of Structures - Strengthening Methods – Retrofitting – Jacketing.

UNIT – V

Health Monitoring of the Structures - Use of Sensors - Building Instrumentation.

Text Books:

1.B.L.Gupta and Amit Gupta, “Maintenance and repair of Civil Structures”, Standard Publication.
2.A.R.Santakumar, “Concrete Technology” Oxford University Press.
3. CPWD – Handbook on “Repair and Rehabilitation on RCC Buildings”.

Reference Books:

1. Bungey, “Non-Destructive Evaluation of concrete Structures ”Surrey University Press.
2. W.H.Ranso, “Concrete Repairs and Maintenance Illustrated ”RS Means Company.

Outcomes :

After completion of this course, students will be able to

- Understand about distress & damage of structures.
- Understand about practical and NDT .
- Understand about corrosion of steel reinforcement.
- Understand about different techniques of repairs of Structures.
- Understand the Health Monitoring of Structures by Sensors.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9142) INDUSTRIAL WASTE WATER TREATMENT
(PROFESSIONAL ELECTIVE-V)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Environmental Engineering

Course Objectives:

Students will be able to:

- Know about Pollution and its Effects .
- Know about different types of industrial wastes.
- Know about Treatment plants.
- Know about Maintenances of Treatment Plants.

UNIT – I

Introduction: Pollution, Sources of Pollution-Physical, Chemical, Organic and Biological Properties of Industrial wastes, Characteristics of Industrial and Municipal wastes, Differences between Industrial wastes and Municipal Wastes, Effects of Industrial wastes on Water bodies and Animals.

UNIT – II

Industrial waste: Characteristics and Composition of waste water and manufacturing processes of Industries like sugar mill, Dairy, Textile mill, Petroleum Refineries.

UNIT – III

Pre and Primary Treatment: Equalization, Proportioning, Neutralization, Oil Separation by Floating, Waste Reduction, Volume Reduction, Waste Treatment Methods, Nitrification and De-Nitrification, Phosphorous removal, Heavy metal removing, Membrane separation process, Disposal of Treated waste Water.

UNIT – IV

Treatment Plant: Joint Treatment Plant(JTP) of Raw Industrial waste water and Domestic Sewage, Common Effluent Treatment Plant(CETP), Location, Design, Operation.

UNIT – V

Maintenance: Maintenance, causes, Inspection, Cleaning of sewers, Flushing of sewers, Maintaining the Treatment plant, Checking condition of Treatment plant, Sewer Repair.

Text Books:

1. Industrial Waste Water pollution Control by W.wesley Eckenfelder-McGraw Hill
2. Industrial Treatment by Rao & Datta.

Reference Books:

1. Water Supply and Waste Water Engineering by D. Lal & A. K. Upadhyay- S. K .Kataria & Sons.

Course Outcomes:

After completion of this course, student should be able to

- minimize the Pollution.
- do the operating of Treatment Plant.
- reduce volume of waste water.
- know about Maintenance of Treatment plant.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9143) DESIGN & DRAWING OF IRRIGATION STRUCTURES
(PROFESSIONAL ELECTIVE-V)

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Engineering Hydrology, Irrigation Engineering

Course Objectives

Student will be able to

- Describe the role of various structures for the control of flows in open channels and canals for the benefit of society.
- Demonstrate the hand-on experience in drawing of irrigation and environmental engineering structures
- Apply the engineering knowledge to the architecture and design of weirs
- Analyze and compare various design options for energy dissipation structures

Design and drawing of the following hydraulic structures.

Group A

1. Surplus weir
2. Syphon Well Drop
3. Trapezoidal notch fall
4. Tank Sluice tower head

Group B

1. Sloping glacis weir
2. Canal regulator
3. Under Tunnel
4. Type III Syphon aqueduct

Final Examination pattern:

The Question paper is divided into two parts with two questions in each part. The student has to answer ONE question for each part. Part I should cover the designs and drawings from Group A for 40 marks and Part II should cover only designs from group B carrying 30marks. The duration of examination will be FOUR hours.

However, the students are supposed to practice the drawings for Group B structures also for internal evaluation.

TEXT BOOKS

1. Design of minor irrigation and canal structures by C. Satyanarayana murthy, New Age International Publishers, New Delhi, 1990.
2. Irrigation Engineering and Hydraulic Structures by S.K.Garg, S.K. Khanna Publishers, 2010.

REFERENCES

1. Hydraulic Structures; P. Novak, AIB Moffat, C. Nalluri, and R. Narayanan: Taylor & Francis, New York, 2007.
2. Design Textbooks in Civil Engineering – Irrigation Engineering – Vol VI – Dams; L Leliavsky; Chapman & Hall,
3. Theory and Design of Irrigation Structures; Varshney, Gupta, Gupta; Nem Chand, 1979.
4. Text book of irrigation Engineering & Hydraulic Structures – R.K. Sharma, Oxford & IBH Publishing Company, New Delhi, 2002.

Course Outcomes

After completion of this course, student should be able to

- Identify appropriate hydraulic structures under different conditions.
- Analyze, design and draw different kinds of hydraulic structures.
- Prepare engineering drawing and design reports
- Select an appropriate design for a given engineering, environmental, social and economic consideration.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9144) ENVIRONMENTAL ENGINEERING LAB

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
0	0	3	2

Pre Requisites : None

Course Objectives

Student will be able to

- Understands the test to determine p^H and conductivity of water
- Understand procedures to test water and waste water
- Understand procedures to determine BOD and COD of water
- Understands the procedure to find chloride content in water

LIST OF EXPERIMENTS

1. Determination of pH
2. Determination of Turbidity
3. Determination of Conductivity
4. Determination of Acidity.
5. Determination of iron.
6. Determination of Dissolved Oxygen.
7. Determination of Nitrates.
8. Determination of Chlorine demand
9. Determination of total Phosphorous.
10. Determination of B.O.D
11. Determination of C.O.D

Course Outcomes

After completion of this course, student should be able to

- Test water and waste water samples to determine p^H and conductivity
- Determine BOD and COD of water
- Determine chloride content in water
- Estimate quality of water and waste water.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9145) HIGHWAY ENGINEERING LAB

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
0	0	3	2

Pre Requisites : Highway Engineering

Course Objectives:

Student will be able to

- Learn about test on aggregates - materials used road constructions
- Gain knowledge on Bitumen grading used for flexible pavement construction.
- Analyze different tests on Bitumen materials along with its specifications.
- Examine test performed for Bitumen mixes.

I. ROAD AGGREGATES:

1. Aggregate Crushing value
2. Aggregate Impact Test.
3. Abrasion Test
4. Attrition Test
5. Flakiness Index
6. Elongation Index.

II. BITUMINOUS MATERIALS:

1. Penetration Test
2. Ductility Test
3. Softening Point Test
4. Flash and fire point tests

Text Book:

1. Laboratory Manual in Highway Engineering by Ajay K.Duggal and Vijay P. Puri - Newage Publishers.
2. Highway Material Testing by Khanna S.K., Justo C.E.G, NemChand & Bros.
3. Principles and practice of Highway Engineering, L.R Kadiyali & N.B.Lal, Khanna, 2007.
4. Traffic Engineering and Transportation planning, L.R Kadiyali, Khanna publications, 2007.

Course Outcomes:

After completion of this course, student should be able to

- Categorize aggregate used in pavements along with its suitability
- Identify and select the various Design strategies of pavement using Lab Equipment.
- Appraise on bitumen grades.
- Evaluate stability parameters of bitumen mixes.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9146) STRUCTURAL DRAFTING LAB

IV Year B.Tech. Civil Engg. I-Sem

L	T	P	C
0	0	3	2

Pre Requisites :

Course Objectives:

Student will be able to

- Use of CAD software.
- Use different commands to draw Building Drawings.
- Draw different components of Doors and Windows.
- Draw different types of Trusses.

1. Introduction to computer aided drafting
2. Software for CAD – Introduction to different softwares
3. Practice exercises on CAD software
4. Drawing of plans of buildings using software
   a) single storied buildings b) multi storied buildings
5. Developing sections and elevations for
   a) single storied buildings b) multi storied buildings
6. Detailing of building components like Doors, Windows, Roof Trusses etc. using CAD softwares
7. Exercises on development of working of buildings

Text Books :

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

Course Outcomes:

After completion of this course, student should be able to:

- Use different Cad Commands to develop Plan, Section and elevation of single Storied and Multi Storied Buildings.
- Draw and detailing of components of different types of doors and windows.
- Develop Working Drawings of Residential Buildings.
- Prepare drawing with details of roof trusses.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9147) INDUSTRY ORIENTED MINI PROJECT

IV Year B.Tech. Civil Engg. I-Sem	**L**	**T**	**P**	**C**
	0	**0**	**0**	**2**

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9148) PAVEMENT DESIGN
(PROFESSIONAL ELECTIVE-VI)

IV Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Highway Engineering

Course objectives

Student will be able to

- Understand the pavement management concepts.
- Apply the various types of highway appurtenance to enhance the safety of motorists.
- Understand the basic modelling concepts used to analyze flexible and rigid pavements.
- Learn to analyze the low volume roads.

UNIT – I

Factors Affecting Pavement Design: Variables Considered in Pavement Design, Types of Pavements, Functions of Individual Layers, Classification of Axle Types of Rigid Chassis and Articulated Commercial Vehicles, Legal Axle and Gross Weights on Single and Multiple Units, Tire Pressure, Contact Pressure, EAL and ESWL Concepts, Traffic Analysis: ADT, AADT, Truck Factor, Growth Factor, Lane, Directional Distributions & Vehicle Damage Factors, Effect of Transient & Moving Loads.

UNIT – II

Stresses In Pavements: Vehicle-Pavement Interaction: Transient, Random & Damping Vibrations, Steady State of Vibration, Experiments on Vibration, Stress Inducing Factors in Flexible and Rigid pavements. **Stresses In Flexible Pavements**: Visco-Elastic Theory and Assumptions, Layered Systems Concepts, Stress Solutions for One, Two and Three Layered Systems, Fundamental Design Concepts.**Stresses In Rigid Pavements**: Westergaard's Theory and Assumptions, Stresses due to Curling, Stresses and Deflections due to Loading, Frictional Stresses, Stresses in Dowel Bars & Tie Bars

UNIT – III

Material Characteristics: CBR and Modulus of Subgrade Reaction of Soil, Mineral aggregates – Blending of aggregates, binders, polymer and rubber modified bitumen, Resilient, Diametral Resilient and Complex (Dynamic) Moduli of Bituminous Mixes, Permanent Deformation Parameters and other Properties, Effects and Methods of Stabilisation and Use of Geo Synthetics.

UNIT - IV

Design Of Flexible Pavements: Flexible Pavement Design Concepts, Asphalt Institute's Methods with HMA and other Base Combinations, AASHTO, IRC Methods

Design Of Rigid Pavements: Calibrated Mechanistic Design Process, PCA, AASHTO & IRC Specifications, Introduction to Prestressed and Continuously Reinforced Cement Concrete Pavement Design.

UNIT – V

Design of Pavement for Low Volume Roads: Pavement design for low volume roads, Rural road designs – code of practice.

Design of Overlays: Types of Overlays, Suitability, Design of overlays.

Text Books:

1. Concrete Pavements, AF Stock, Elsevier, Applied Science Publishers
2. Pavement Analysis & Design, Yang H. Huang, Prentice Hall Inc

References:

1. Design of Functional Pavements, Nai C. Yang, McGraw Hill Publications
2. Principles of Pavement Design, Yoder.J. & Witzorac Mathew, W. John Wiley & Sons Inc
3. Pavement and Surfacings for Highway & Airports, Micheal Sargious, Applied Science Publishers Limited.
4. IRC Codes for Flexible and Rigid Pavements design

Course Outcomes:

After completion of this course, student should be able to

- Analyze the factors effecting the payments.
- Analyze the stresses in payments
- Design flexible and rigid pavements
- Design of payment for low volume roads

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9149) EARTH AND ROCKFILL DAMS
(PROFESSIONAL ELECTIVE-VI)

IV Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Irrigation Engineering
Course Objectives:

Student will be able to

- Identify, formulate, and solve soil stability related problems.
- Understand the failures of earth dams
- Analyze the slope stability analysis
- Analyze rock fill dams.

UNIT-I
Earth and Rockfill Dams Introduction: General features, Selection of site; Merits and demerits of the earth and rock fill dams, Classification of earth dams, Materials of construction and requirements, Causes of failure, Safe design criteria. Instrumentation in earth dams: Pore pressure measurements, Settlement gauges, Inclinometers, Stress measurements, seismic measurements.

UNIT-II
Failures, Damages and Protection of Earth Dams: Nature and importance of failure, Piping through embankment and foundations, Methods of seepage control through embankments and foundations, Design Criteria for filters, Treatment of upstream and downstream of slopes, Drainage control, Filter design.

UNIT-III
Slope Stability Analysis: Types of Failure: Failure surfaces - Planar surfaces, Circular surfaces, Non-circular surfaces, Limit equilibrium methods, Total stress analysis versus effective Stress analysis, Use of Bishop's pore pressure parameters, Short term and Long term stability in slopes.

UNIT-IV
Methods of Slope Stability: Taylor Charts, Method of Slices, Effect of Tension Cracks, Vertical Cuts. Bishop's Analysis, Bishop and Morgenstern Analysis, Noncircular Failure Surfaces: Morgenstern and Price Analysis, Janbu Analysis, Spencer Analysis, Sliding Block Analysis, Seismic stability, Stabilization of slopes: Drainage measures, Soil reinforcement (geosynthetics/soil nailing/micro piles etc), soil treatment (cement/lime/thermal treatment), surface protection (vegetation/erosion control mats/shotcrete).

UNIT-V
Rockfill Dams: Requirements of compacted rockfill, Shear strength of rockfill, Rockfill mixtures, Rockfill embankments, Earth-core Rockfill dams, Stability, Upstream & Downstream slopes, Dynamic analysis.

Text Books:

1. Sherard – Earth and Earth Rock Dams.
2. Sowers, G. F. and Salley, H. I. – Earth and Rockfill Dams
3. Bharat Singh and Sharma, H. D. – Earth and Rockfill Dams.
4. Abramson, L. W., Lee, T. S. and Sharma, S. - Slope Stability and Stabilisation methods – John Wiley & sons.

References:

1. Bromhead, E. N. (1992). The Stability of Slopes, Blackie academic and professional, London.
2. Christian, Earth & Rockfill Dams – Principles of Design and Construction, Kutzner Published Oxford and IBH.
3. Ortiago, J. A. R. and Sayao, A. S. F. J. - Handbook of Slope Stabilisation, 2004.

Course Outcomes:

After completion of this course, students should be able to

- Develop an ability to apply knowledge of geotechnical engineering to solve problems related to dams and stability.
- Design embankment or sloped land for economic and safe aspects for the society.
- Identify, formulate and solve stability related problems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9150) FINITE ELEMENT METHOD
(PROFESSIONAL ELECTIVE-VI)

IV Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Mathematics

Course objectives

Student will be able to

- Understand the general steps of finite element methods.
- Understand the basic finite element formulation techniques.
- Equip with the Finite Element Analysis fundamentals.
- Perform engineering simulations using Finite Element Analysis

UNIT I

Introduction: Concepts of FEM - steps involved - merits and demerits - energy principles – discrimination - Raleigh - Ritz method of functional approximation.

Principles of Elasticity: Stress equations - strain displacement relationships in matrix form plane stress, plane strain and axi-symmetric bodies of revolution with axi-symmetric loading.

UNIT II

One dimensional FEM: Stiffness matrix for beam and bar elements - shape functions for ID elements.

UNIT III

Two dimensional FEM: Different types of elements for plane stress and plane strain analysis - displacement models - generalized coordinates - shape functions - convergent and compatibility requirements - geometric invariance - natural coordinate system - area and volume coordinates - generation of element stiffness and nodal load matrices

UNIT IV

Isoparametric formulation: Concept - different isoparametric elements for 2D analysis - formulation of 4-noded and 8-noded isoparametric quadrilateral elements - Lagrange elements - serendipity elements.

UNIT V

Axi Symmetric Analysis: bodies of revolution - axi symmetric modeling - strain displacement relationship - formulation of axi symmetric elements. Three dimensional FEM: Different 3-D elements-strain-displacement relationship – formulation of hexahedral and isoparametric solid element.

TEXT BOOK:

1. A first course in Finite Element Method by Daryl L. Logan, 5^{th} Edition, Cengage Learning India Pvt. Ltd.
2. Introduction to Finite Elements in Engineering by Tirupathi R. Chandrupatla, and Ashok D. Belegundu, Prentice Hall of India

REFERENCES:

1. Finite Element Aanalysis by P.Seshu, PHI Learning Private Limited
2. Concepts and applications of Finite Element Analysis by Robert D. Cook David S. Malkus, Michael E. Plesha, Robert J. Witt, Wiley India Pvt. Ltd.
3. Applied Finite Element Analysis by G.Ramamurty, I.K.International Publishing House Pvt. Ltd.

Course Outcomes:

After completion of this course, student should be able to

- Solve multi-disciplinary problems
- Derive equations in finite element methods for 1Dand 2D problems.
- Formulate and solve basic problems in structural mechanics using different elements.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9151) CONSTRUCTION TECHNOLOGY AND PROJECT MANAGEMENT
(OPEN ELECTIVE-III)

IV Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : Concrete Technology, Estimating & Costing

Course Objectives:

Students will be able to:

- Learn the fundamentals of construction law.
- Learn the fundamentals of construction safety.
- Understand various equipments used in construction.
- Learn Fundamentals of Project Planning.

UNIT-I

Fundamentals of construction Technology – Construction activities – process – construction schedule – construction records – documents – quality – safety – codes and regulations.

UNIT-II

Construction method – earthwork – piling – concrete and concreting – formwork – fabrication and erection - Mechanized construction – construction equipment – equipment economics – excavators – Rollers – Dozers – Scrapers – Handling equipment – concrete equipment – cranes – draglines and clamshalls

UNIT-III

Quality control, Assurance and safety – ISO – 9000 – quality systems – principles on safety – personnel, fire and electrical safety – environment protection – concept of green building.

UNIT-IV

Contract management – project estimation – types of estimation – contract document – Earnest money deposit - Further security deposit –Powers of sanctions - classification with specific reference to PPP and BOT Projects – bidding – procurement process - Construction planning – project planning techniques – planning of manpower, material, equipment and finance.

UNIT-V

Project scheduling – PERT – CPM, Resource leveling - Construction claims, Dispute and project closure – source of claim – claim management – Dispute Resolution – Arbitration – Construction Closure – Contract Closure – Documentation.

TEXT BOOKS

1. Ghalot, P.S., Dhir,D.M., Construction Planning and Management, Wiley Eastern Limited,1992.
2. Chitkara,K.K., Construction Project Management¸ Tata McGraw Hill Publishing Co, Ltd., New Delhi,998.
3. Subir K.Sarkar, Subhajit Saraswati, Construction Technology, Oxford University Press
4. Niraj kumar jha, Construction Project Management – Theory and Practice, Pearson Education

REFERENCES:

1. B. Sengupta and H. Guha, Construction Management and Planning, tata mcgraw-hill publications
2. Punmia,B,C., Project Planning and Control with PERT and CPM, Laxmi Publications, New Delhi,1987.

Course Outcomes:

After completion of this course, student should be able to

- Differentiate construction equipment.
- Prepare Plan and control resources of projects.
- Prepare Construction Schedule by using different methods.
- Know ISO 9000 Standards.
- Prepare schedule of activities in a construction project

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9330) NANO TECHNOLOGY
(OPEN ELECTIVE-III)

IV Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : None

Course Objectives:

Students will be able to:

1. Understand the fundamentals of Nano theory, necessary background for applications in various industries.
2. Learn the components of Nano materials in detail, and its working in different applications
3. Understand the general scientific concepts required for technology, Apply the concepts in solving engineering problems,
4. Explain scientifically the new developments in engineering and technology, and Get familiarized with the concepts, theories, and technological applications.

Unit-I:

Introduction to nanotechnology: Importance of nanoscale, Nanostructure types, electronic, magnetic, optical Properties of Nanomaterials, top-down and bottom – up approach to nanostructures.

Unit-II:

Quantum Mechanical phenomenon in nanostructures: Quantum confinement of electrons in semiconductor Nano structures, one dimensional confinement (Quantum Wires), two dimensional confinements (Quantum Wells), three dimensional confinements (Quantum dots).

Carbon Nano Structures: Carbon nanotubes (CNTs), Fullerenes, C60, C80 and C240 Nanostructures, properties (mechanical, optical and electrical) and applications.

Unit-III:

Fabrication of Nanomaterials: Physical Methods: Inert gas condensation, Arc discharge, RF plasma, plasma arc technique, lon sputtering, Laser ablation, Laser pyrolysis, Molecular beam eqitaxy, Chemical vapour deposition method.

Unit-IV:

Nano Scale characterization techniques: Scanning probe techniques (AFM, MFM, STM, SEM, TEM), XRD.

Nanodevices and Nanomedicine: Lab on chip for bioanalysis, Core/shell Nanoparticles in drug delivery systems (site specific and targeted drug delivery), cancer treatment, and bone tissue treatment.

Unit-V:

Nano and molecular electronics: Resonant-Tunneling Structures, single electron tunneling, Single Electron transistors, coulomb blockade, glant magneto resistance, tunneling magneto resistance.

Nanolithography and nanomanipulation: e-beam lithography and SEM based nanolithography and nanomanipulation, lon beam lithography, oxidation and metallization Mask and its application. Deep UV lithography, x-ray based lithography.

Text Books:

1. Charies.P.pode, introduction to nanotechnology, springer publications.
2. Springer Handbook of Nanotechnology-Bharat Bhusan.
3. Phani Kumar, principles of nanotechnology, scitech publications.

References Books:

1. David Ferry "Transport in Nano structures" Cambridge University press 2000.
2. Nanobiotechnology; ed, C.M.Niemeyer, C.A. Mirkin.
3. Nanofabrication towards biomedical application: Techniques, tools, Application and impact-Ed. Challa S., S.R.Kumar, J.H.Carola.
4. Encyclopedia of Nanotechnology-Hari Singh Nalwa
5. Carbon Nanotubes: Properties and Applications- Michael J.O'Connell.
6. S.Dutta "Electron Transport in Mesoscopic systems" Cambridge University press.
7. H.Grabert and M.Devoret "Single charge Tunneling" Plenum press 1992.

Course Outcomes:

After completion of this course, student should be able to

1. Understand the fundamentals of Nanotechnology
2. Know the different classes of nano materials
3. Impart basic knowledge on various synthesis and characterization techniques involved in Nanotechnology
4. Make the learner familiarize with nanotechnology potentialities.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9218) RENEWABLE ENERGY SOURCES
(OPEN ELECTIVE-III)

IV Year B.Tech. Civil Engg. II-Sem

L	T	P	C
3	1	0	3

Pre Requisites : None

Course Objectives:

Students will be able to:

- Introduce to the technology of renewable sources of energy.
- Learn about the solar radiation, its applications and radiation measuring instruments.
- Learn about the various types of geothermal resources and its applications.
- Study the biomass energy resources, bio-mass systems.
- Learn the methods of energy extraction from the wind and oceans.
- Learn to the technology of direct energy conversion methods.

UNIT – I

PRINCIPLES OF SOLAR RADIATION: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data for India.

UNIT-II

SOLAR ENERGY COLLECTION: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors, tracking CPC and solar swing

SOLAR ENERGY STORAGE AND APPLICATIONS: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion, applications of PV system-PV hybrid systems

UNIT-III

WIND ENERGY: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria, analysis of aerodynamic forces acting on blade, applications.

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C.Engine operation and economic aspects, biomass resource development in India.

UNIT-IV

GEOTHERMAL ENERGY: Structure of earth's interior- geothermal sites- earthquakes & volcanoes- geothermal resources- hot springs-steam ejection- principle of working- types of geothermal station with schematic representation site selection for geothermal power plants-problems associated with geothermal conversion-applications-geothermal energy prospects in India.

OCEAN ENERGY: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT-V

DIRECT ENERGY CONVERSION: Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, seebeck, peltier and joule Thomson effects, Figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

Text Books:

1. Non-Conventional Energy Sources by G.D. Rai, Khanna Publihers, fourth edition, 2008

Reference Books:

1. Suhas.P.Sukhatma and Nayak.J.K., "solar Eenergy", TMH, New Delhi, 3rd edition, 2008
2. D.P.Kothari and Rakesh Ranjan and K.C. Singal., " Renewable energy resources and emerging technologies"Prentice Hall of India Pvt.Ltd., 2nd Edition, 2011
3. Non-Conventional Energy Systems / K Mittal /Wheeler

Course Outcomes:

After completion of this course, student should be able to

- Apply the technology to capture the energy from the renewable sources like sun, wind, ocean, biomass, geothermal.
- Use different renewable energy sources to produce electrical power
- Minimize the use of conventional energy sources to produce electrical energy
- Identify the fact that the conventional energy resources are depleted

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9152) COMPREHENSIVE VIVA

IV Year B.Tech. Civil Engg. II-Sem	**L**	**T**	**P**	**C**
	0	**0**	**0**	**3**

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9153) SEMINAR

IV Year B.Tech. Civil Engg. II-Sem	**L**	**T**	**P**	**C**
	0	**0**	**3**	**3**

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A9154) PROJECT

IV Year B.Tech. Civil Engg. II-Sem	**L**	**T**	**P**	**C**
	0	**0**	**15**	**12**

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