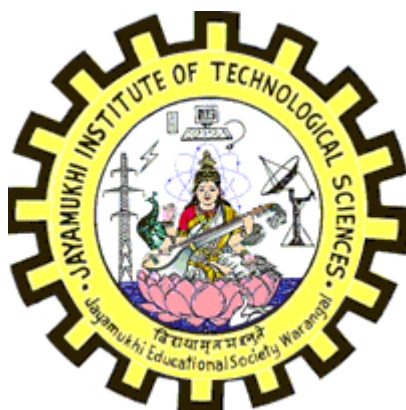# ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

CIVIL ENGINEERING

for

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

College Code: C4

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
Affiliated to Jawaharlal Nehru Technological University Hyderabad
Narasampet, Warangal – 506 332
Telangana State, India

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. Award of B.Tech. Degree

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 186 credits with an exemption of 6 credits in elective subjects only.

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 by College Academic Council (CAC) to complete the course for a further period.

2. Courses of Study

The following courses of study are offered at B.Tech level:

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

3. Credits:

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	-	-	-	03
Comprehensive Viva Voce	-	-	-	03
Seminar	-	-	02	03
Major Project	-	-	15	12

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 Parent Discipline/ Department/ Branch of Engineering	35%-40%
4.	Elective Courses (EC)	PE-Professional Electives	Includes Elective subjects related to 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		One or two 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.

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 3rd 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. **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.

8. Distribution and Weightage of Marks:

8.1   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.

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

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

8.4   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.

8.5   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.

8.6   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.

8.7   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.

8.8   The details of the Question Paper pattern for theory examination is as follows:
(i)   The end semesters exam will be conducted for 70 Marks which consist of two parts viz. Part-A for 20 Marks and Part-B for 50 Marks.
(ii)   Part-A is compulsory question which consist of 5 Sub-questions, one from each unit, carrying 4 Marks each.

(iii)   Part-B consist of 5 questions (numbered from 2 to 6) carrying 10 marks each. Each of these questions, there will be an either or choice(i.e There will be two questions from each unit and student will answer any one question).

8.9   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.

8.10   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.

8.11   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.

8.12   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.

8.13   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.

8.14   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.

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

9. Attendance Requirements:

9.1   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.

9.2   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.

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

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

9.5 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.

10. Minimum Academic Requirements:

The following academic requirements have to be fulfilled in addition to the attendance requirements mentioned in item no.09.

10.1 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.

10.2 A student shall be promoted from I Year to II Year unless he fulfills the minimum academic requirements of 24 credits out of 48 credits of I Year from all examinations and secures prescribed minimum attendance in I Year.

10.3 A student shall be promoted from II year to III year only if he fulfills the academic requirement of 36 credits out of 72 credits from one regular and one supplementary examinations of I Year and one regular and one supplementary examination of II year I semester irrespective of whether or not the candidate takes the examination and secures prescribed minimum attendance in II Year II Semester.

10.4 A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 60 credits out of 120 credits secured from all the examinations both regular and supplementary conducted up to end of III Year I semester irrespective of whether or not the candidate takes the examination and secures prescribed minimum attendance in III Year II Semester
   a) Two regular and two supplementary examinations of I Year
   b) Two regular and two supplementary examinations of II Year I semester
   c) Two regular and one supplementary examinations of II Year II Semester.
   d) One regular and one supplementary examination of III Year I semester.

10.5 A student should earn all credits with an exemption of 6 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.

10.6 Student who fails to earn credits with an exemption of 6 credits as indicated in the Programme structure within 8 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 of 2Years.

10.7 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 186 credits securing Semester Grade Point Average (SGPA)≥4.5 in each semester, and Cumulative Grade Point Average (CGPA) ≥ 4.5 at the end of each successive semester, to successfully complete the B.Tech Programme.

10.8   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.

10.9   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.

10.10   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.

11. Grading Procedure

11.1   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.

11.2   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	OS (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

11.3   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.

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

11.5 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. 10.8-10.9).

11.6 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

11.7 The student passes the Subject/Course only when he gets G.P.$\geq$4 (P Grade above).

11.8 The Semester Grade Point Average (SGPA) is calculated by dividing the Sum of Credit Points ($\sum$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

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

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 ith subject and G_i is represents the Grade Points (G.P.) corresponding to the Letter Grade awarded for that i^{th} Subject.

11.9 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 6 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.

$$\left\{\sum_{j=1}^{M} C_j G_j\right\} / \left\{\sum_{j=1}^{M} C_j\right\}$$

….for all 'S' semesters registered (i.e., upto and inclusive of 'S' semester, S$\geq$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 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.

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

11.11 For calculation listed in item no.11.6-11.10, 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.

12. Passing Standards:

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

12.2. 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.9-10);

 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.

12.3. 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.

12.4 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.

13. Declaration of Results:

13.1 Computation of SGPA and CGPA are done using the procedure listed in item no.11.6 – 11.10.

13.2 For Final % of Marks equivalent to the computed final CGPA, the following formula may be used:
% of Marks = (Final CGPA – 0.5) X 10

14. Award of Degree under CBCS:

14.1 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 186 credits with an exemption of 6 credits in elective subjects only.

iii. Secures Cumulative Grade Point Average (CGPA) ≥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.

14.2 A student who qualifies for the Award of the Degree as per **item 13.2** 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

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

15. 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.

16. 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).

Details of Transitory regulations:

B.Tech (R15) CBCS program approved under Item No: 16 of Academic Regulations.

Admission with advance standing: These may arise in the following cases:

1) When a student seeks transfer from other college to Jayamukhi Institute of Technological Sciences (JITS) and desires to pursue study at JITS in an eligible branch of study.

2) When students of JITS get transferred from one regulation to another regulation or from previous syllabus to revised syllabus.

3) When as student after long discontinuity rejoins the college to complete his Programme of study for the award of a degree.

4) When a student is not able to pursue his/her existing Programme of study but wishes to get transferred to another Programme of study. These admissions may be permitted by

the Academic Council of JITS as per the norms stipulated by the statutory bodies and the Govt. of Telangana. In all such cases for admission, when needed, permissions from the statutory bodies are to be obtained and the Programme of study at JITS will be governed by the transitory regulations given below.

I. Transitory Regulations: For students admitted under advance standing, these transitory regulations will provide the modus operandi. At the time of such admission, based on the Programme pursued (case by case)

1. Equivalent courses completed by the student are established by the Chairman, BOS concerned.

2. Marks/Credits are transferred for all such equivalent courses and treated as successfully cleared in the Programme study prescribed by JITS.

3. A Programme chart of residual courses not cleared will be derived and a Programme of study with duration specified will be prescribed for pursuing at JITS.

4. Marks obtained in the previous system if the case be, are converted to grades and accordingly CGPA is calculated. All other modalities and regulations governing shall be the same as those applicable to the stream of students with whom such a candidate is merged.

5. The students those who are on rolls to be provided one chance to write the internal exams in the **subjects not studied**, as per the clearance letter (equivalence) issued by Chairman, BOS.

6. After the revision of the regulations, the students of the previous batches will be given two subsequent chances for passing in their failed subjects, one supplementary and the other regular. If the students cannot clear the subjects in the given two chances, they shall be given equivalent subjects as per the revised regulations which they have to pass in order to obtain the required number of credits.

II. Transitory Regulations for the students who have discontinued the programme:

1) 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,

2) The student is permitted to register for 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).

   Scope:
   1. The academic regulations should be read as a whole, for the purpose of any interpretation.
   2. In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.

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

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 (Total 144) 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 6 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 if he fulfills the minimum academic requirements of 24 credits of out of 48 credits of II Year from all examinations and secures prescribed minimum attendance in II Year.

     ii.   A student shall be promoted from III year to IV year only if he fulfills the academic requirements of 36 credits out of 72 credits secured from the following examinations, whether the candidate takes the examination or not, and secure prescribed minimum attendance in III Year II Semester.

        a) Two regular and Two Supplementary examinations of II Year I Semester
        b) Two regular and one supplementary examinations of II Year II Semester.
        c) One regular and one supplementary examination of III Year I 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	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

	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 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.	case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the 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 referred to Examination Result Processing Committee (ERPC) further action to award suitable Punishment.	

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

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

I YEAR I SEMESTER

S.No	Code	Subject	L	T	P	Credits
1	AJ1001	Mathematics-I	4	0	0	4
2	AJ1013	English	3	0	0	3
3	AJ1010	Engineering Chemistry	3	0	0	3
4	AJ1301	Engineering Mechanics-I	3	1	0	3
5	AJ1304	Engineering Graphics-I	3	0	4	4
6	AJ1504	Computer Programming	3	0	0	3
7	AJ1014	English Language Communication Skills Lab	0	0	3	2
8	AJ1505	Computer Programming Lab	0	0	3	2
Total			**19**	**1**	**10**	**24**

I YEAR II SEMESTER

S.No	Code	Subject	L	T	P	Credits
1	AJ2002	Mathematics-II	3	1	0	4
2	AJ2008	Engineering Physics	3	1	0	3
3	AJ2302	Engineering Mechanics-II	4	1	0	4
4	AJ2305	Engineering Graphics-II	3	0	4	4
5	AJ2508	OOP and Data Structures	3	0	0	3
6	AJ2307	Engineering Workshop & IT Work Shop	0	0	3	2
7	AJ2011	Physical Sciences Lab	0	0	3	2
8	AJ2509	OOP and Data Structures Lab	0	0	3	2
Total			**16**	**3**	**13**	**24**

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

COURSE STRUCTURE

II Year – I SEMESTER   **III Semester**

Sl. No.	Code	Subject	L	T	P	Credits
1	AJ3101	Strength of Materials -I	4	1	0	4
2	AJ3102	Fluid Mechanics	4	1	0	4
3	AJ3103	Surveying	4	0	0	4
4	AJ3104	Building Materials, Construction & Planning	4	0	0	4
5	AJ3012	Environmental Studies	2	1	0	2
6	AJ3105	Strength of Materials Lab	0	0	3	2
7	AJ3106	Surveying lab-I	0	0	3	2
8	AJ3107	Computer Aided Drafting of Buildings Lab	0	0	3	2
		Total Credits	18	3	9	**24**

II Year – II SEMESTER   **IV Semester**

Sl. No.	Code	Subject	L	T	P	Credits
1	AJ4005	Probability and Statistics	3	1	0	3
2	AJ4108	Strength of Materials-II	4	1	0	4
3	AJ4109	Concrete Technology	4	0	0	4
4	AJ4111	Hydraulics & Hydraulic Machinery	4	1	0	4
5	AJ4203	Basic Electrical and Electronics Engineering	3	0	0	3
6	AJ4112	Fluid Mechanics & Hydraulic Machinery Lab	0	0	3	2
7	AJ4113	Surveying Lab-II	0	0	3	2
8	AJ4204	Basic Electrical and Electronics Engineering Lab	0	0	3	2
		Total Credits	18	3	9	**24**
9	AJMC01	Gender Sensitization	0	0	3	0

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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COURSE STRUCTURE

III Year – I SEMESTER   **V Semester**

Sl. No.	Code	Subject	L	T	P	Credits
1	AJ5114	Design of Reinforced Concrete Structures	4	1	0	4
2	AJ5115	Structural Analysis-I	4	1	0	4
3	AJ5116	Engineering Geology & Rock Mechanics	3	0	0	3
4	AJ5117	Soil Mechanics	3	1	0	3
5		**Open Elective-I**	3	0	0	3
6	AJ5134 AJ5135 AJ5136	**Professional Elective-I** Engineering Hydrology Pre Stressed Concrete Remote Sensing and GIS	3	1	0	3
7	AJ5118	Engineering Geology Lab	0	0	3	2
8	AJ5119	Concrete Technology Lab	0	0	3	2
		Total Credits	20	4	6	**24**
9	AJMC02	Value Education, Human Rights and Legislative procedure	2	0	0	0

III Year – II SEMESTER   **VI Semester**

Sl. No.	Code	Subject	L	T	P	Credits
1	AJ6120	Irrigation Engineering and Hydraulic Structures	4	0	0	4
2	AJ6121	Structural Analysis-II	4	1	0	4
3	AJ6122	Design of Steel Structures	4	1	0	4
4		**Open Elective-II**	3	0	0	3
5	AJ6137 AJ6138 AJ6139	**Professional Elective-II** Bridge Engineering Watershed Management Rehabilitation and Retrofitting of Structures	3	1	0	3
6	AJ6015	Advanced Communication Skills Lab	0	0	3	2
7	AJ6123	Soil Mechanics Lab	0	0	3	2
8	AJ6124	Structural Engineering Detailing Lab	0	0	3	2
		Total Credits	18	3	9	**24**
9	AJMC03	Energy Studies	2	1	0	0

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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COURSE STRUCTURE

IV Year – I SEMESTER   **VII Semester**

Sl. No.	Code	Subject	L	T	P	Credits
1	AJ7125	Environmental Engineering	4	1	0	4
2	AJ7126	Highway Engineering	4	1	0	4
3		**Open Elective-III**	3	0	0	3
4	AJ7140 AJ7141 AJ7142	**Professional Elective-III** Foundation Engineering Advanced Analysis of Structures Elements of Earth Quake Engineering	3	1	0	3
5	AJ7143 AJ7144 AJ7145	**Professional Elective-IV** Estimation & Valuation Theory of Elasticity and Plasticity Traffic Engineering and Transportation Planning	3	1	0	3
6	AJ7127	Environmental Engineering Lab	0	0	3	2
7	AJ7128	Highway Engineering Lab	0	0	3	2
8	AJ7181	Mini Project / Industrial Training	0	0	3	3
		Total Credits	17	4	9	**24**

IV Year – II SEMESTER   **VIII Semester**

Sl. No.	Code	Subject	L	T	P	Credits
1	AJ8146 AJ8147 AJ8148	**Professional Elective-V** Ground Improvement Techniques Railway and Airport Engineering Finite Element Method	3	1	0	3
2	AJ8149 AJ8150 AJ8151	**Professional Elective-VI** Construction Planning and Project Management Industrial Waste Water Treatment Advanced Reinforced Concrete Structures	3	1	0	3
3	AJ8182	Seminar	0	6	0	3
4	AJ8183	Comprehensive Viva	0	0	0	3
5	AJ8184	Project Work	0	0	15	12
		Total Credits	6	8	15	**24**

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)
Narsampet, Warangal-506 332

LIST OF OPEN ELECTIVES (COLLEGE LEVEL)

Sr.No.	Subject code	Name of the Open Elective Subject	Preferable Semester
Department of ECE			
1.	AJ5418	Electronic Measurements and Instrumentation	V
2.	AJ5416	Computer Organization	V
3.	AJ5417	IC Applications	V
4.	AJ6446	Instrumentation	VI
5.	AJ6447	Electromagnetic Theory	VI
6.	AJ6448	Image and Video Processing	VI
7.	AJ7449	Bio-medical Instrumentation	VII
8.	AJ7424	Digital Signal Processing	VII
9.	AJ7440	Wireless Sensor Networks	VII
Department of EEE			
10.	AJ5212	Electrical Technology	V
11.	AJ5220	Renewable Energy Sources	V/VI
12.	AJ5221	Energy Storage Systems	V/VI
13.	AJ5222	Electrical Engineering Materials	V/VI
14.	AJ6240	Neural Networks & Fuzzy Logic	VI/VII
Department of CSE			
15.	AJ5511	Data Base Management Systems	V/VI
16.	AJ5521	Computer Networks	V/VI
17.	AJ6529	Network Security	VI/VII
18.	AJ6530	Cloud Computing and IoT	VI/VII
19.	AJ6531	Natural Language Processing	VI/VII
20.	AJ6532	Artificial Intelligence and Robotics	VI/VII
21.	AJ7553	Big-Data Management	VII
Department of ME			
22.	AJ5360	Material Science	V
23.	AJ6365	Strength of Materials	VI
24.	AJ5361	Thermal Sciences	V
25.	AJ5362	Engineering Mechanics	V
26.	AJ7366	Finite Element Analysis	VII
27.	AJ7363	Optimization Techniques and Its Applications	VII
28.	AJ6364	Project Planning and Management	VI
Department of CE			
29.	AJ5129	Disaster Management and Mitigation	V/VI
30.	AJ5130	Environmental Impact Assessment	V/VI
31.	AJ5131	Basics of Civil Engineering	V/VI
32.	AJ6132	Quantity Surveying and Costing	VI
33.	AJ7133	Construction Project Management	VII

		Department of MBA	
34.	AJ_E01	Management Science	V/VII
35.	AJ_E02	Managerial Economics and Financial Analysis	V/VI
36.	AJ_E03	Total Quality Management	V/VI
37.	AJ_E04	Global Marketing	VI/VII
38.	AJ_E05	Green Marketing	VI/VII
39.	AJ_E06	Intellectual Property Rights	V/VI
40.	AJ_E07	Supply Chain Management	V/VI
41.	AJ_E08	Statistical Quality Control	VI/VII
42.	AJ_E09	Financial Analysis and Reporting	V/VI
43.	AJ_E10	Micro, Small and Medium Enterprises Management	V/VI
Note: '_' *represents the subject code with semester of the respective B.Tech branch*			

Note: The Syllabus of Open Electives is given separately in the Annexure

B.TECH

I YEAR

I & II SEMESTER SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1001) MATHEMATICS-I

B.Tech 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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1013) ENGLISH

B.Tech I Year I SEM –Civil,Mech,ECE & EEE   **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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1010) ENGINEERING CHEMISTRY

B.Tech I Year I-SEM Common to all branches

L	T	P	C
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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1301) ENGINEERING MECHANICS-I

B.Tech I-Year I-Sem: CIVIL, MECH

L	T	P	C
3	1	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 component of force in space.
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.
7. Determine the Frictional Forces when the bodies are under motion.

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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1304) ENGINEERING GRAPHICS –I

B.Tech I Year I –Sem: CIVIL& MECH   **L T P C**
                                                3 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.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1504) COMPUTER PROGRAMMING

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

Outcomes:
O-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
O-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
O-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
O-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.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1014) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

B.Tech I year I Sem EEE, ECE, CIVIL & MECH   **L   T   P   C**
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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, JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES, 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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ1505) COMPUTER PROGRAMMING LAB

B.Tech I Year I-Sem: CIVIL & MECH.   **L T P C**
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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,* by Dennis Ritchie

3. *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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2002) MATHEMATICS-II

B.Tech I Yr. II Sem: Common to all branches   **L T P C**

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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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2008) ENGINEERING PHYSICS

B.Tech I Year II Sem: CIVIL & MECH   **L T P C**
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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: Space lattice, lattice point, unit cell, Bravias lattices, Crystal systems. Atomic radius, Co-ordination number and packing fraction of S.C.C., B.C.C & F.C.C. Planes & Crystal directions, Miller indices, Inter-planar spacing of orthogonal, 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: density of energy states, 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,Clausius Mossotti equation Piezo-electricity, Ferro electricity & Pyro electricity (qualitative only),structure of $BaTiO_3$.

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 ,Population inversion, Lasing action. Helium neon laser, diode laser , 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),BCS theory (qualitative treatment), Type-I & Type -II super conductors,Magenetic Levitation Applications.
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 & TEM (principles)- Applications in medicine, engineering & science.

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.

Text Books:
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

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2302) ENGINEERING MECHANICS-II

B.Tech I-Year II-Sem: CIVIL& MECH   **L   T   P   C**
                                                            4   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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2305) ENGINEERING GRAPHICS –II

B.Tech I Year II–Sem: Mechanical, Civil

L	T	P	C
3	0	4	4

COURSE OBJECSTIVES:
1. Development of Surfaces are Most useful of real time applications of in industry.
2. Gain knowledge of 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.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2508) OBJECT ORIENTED PROGRMMING & DATA STRUCTURES

B.Tech 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.

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..

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2307) ENGINEERING WORKSHOP/IT WORKSHOP

B.Tech 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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2011) PHYSICAL SCIENCES LAB

B.Tech I Year B. Tech. II-Sem : CIVIL & MECH   **L T P C**
                                                          0 0 3 2

OBJECTIVES:

This Course *On Engineering* Physics /chemistryLab Designed With12 Experiments In An Academic Year The Objective Of Course Is That The Student Will Have Exposure To Various Experimental Skills Which Is Very Essential For An Engineering Student The Experiments Are Selected From Various Areas Of Physics and chemistry Like Physical Optics, Lasers, Fiber Optics, Electricity And Basic Electronics, conductometry, potentiometry, etc..Also The Students Is Exposed To Various Tools Like Screw Gauge, Vernier Callipers, Physical Balance, Spectrometer And Microscope, viscometer, stalagmometer, etc…

ENGINEERIG PHYSICS

1. Determination of energy gap of semiconductor material of p-n junction diode
2. Determination of frequency of electrical vibrator by using Melde's experiment
3. Determination of wavelength of LASER by using diffraction grating
4. Determination of rigidity modulus of given wire using Torsional pendulum
5. R-C circuit analysis
6. Determination of Numerical aperture of given optical fiber

Laboratory Manual:

1 .Laboratory Manual Of Engineering Physics By Dr. Y.Aparna And Dr K. Venkateswara   Rao

(V.G.S Publishers)

ENGINEERING CHEMTSTRY

1) Estimation of ferrous iron by dichrometry.

2) Estimation of hardness of water by EDTA method.

3) Conduct metric titration of strong acid vs. strong base

4) Titration of strong acid vs. strong base by potentiometry.

5) Determination of viscosity of sample oil by Ostwald's viscometer.

6) Determination of Surface tension of lubricants.

TEXT BOOKS:
1) Practical Engineering Chemistry by K. Mukkanti, etal' B'S' Publications, HYderabad.
2) lnorganic quantitative analysis, Vogel'

REFERENCE BOOKS:
1) Text Book of engineering chemistry by R. N. Goyal and Harrmendra Goel, Ane Books Private Ltd.,
2) A text book on experiments and calculation Engg. S.S. Dara'
   lnstrumental methods of chemical analysis, chatwal, Anand, Himalaya Publications

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ2509)   OBJECT ORIENTED PROGRMMING & DATA STRUCTURES LAB

B.Tech 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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B.TECH

II YEAR

I & II SEMESTER SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

(AJ3101) STRENGTH OF MATERIALS - I

B.Tech. II Year- I Semester - CIVIL

L	T	P	C
4	1	0	4

Objectives :
   1: Behavior of bodies subjected to various types of stresses and the associated strains
   2: Shear force and bending moment for determinate beams
   3: Bending and shear stresses for beams in flexure
   4: Stresses arise in thin and thick cylinders subjected to pressure

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 flitched 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

Outcomes:
 1: Explicate the various types of stresses and the associated strains
 2: Compute the Shear force and bending moment for determinate beams
 3: Assess the Bending and shear stresses for beams in flexure
 4: Analyze and design thick, thin and compound cylinders subjected to pressure

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ3102) FLUID MECHANICS

B.Tech. II Year – I Semester-CIVIL   **L T P C**
                                                         4 1 0 4

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

UNIT – I

INTRODUCTION: Dimensions and units- Physical Properties of Fluid specific gravity, Viscosity, Surface Tension, Vapor Pressure, pressure at a point, Pascal's law, Hydrostatic Law-Atmospheric, Gauge and Vacuum pressure-measurement of pressure. Pressure gauges, Manometers: differential and micro Manometers, Hydro static forces on submerged plane, Horizontal, Vertical, Inclined and Curved surfaces-Centre of Pressure.

UNIT – II

FLUID KINEMATICS: Description of fluid flow, Stream line, Path Line and Streak lines and stream tube. Classification of flows: Steady, unsteady, uniform, non-uniform, laminar, turbulent, rotational and irrotational flows-Equation of continuity for one dimensional, two dimensional , three dimensional flows- stream and velocity potential functions, flow net analysis.

UNIT – III

FLUID DYNAMICS: Surface and body forces- Euler's and Bernoulli's Equation for flow along a stream line for 3-D flow,(Navier –Stokes Equations (Explanatory) Momentum equation and it's 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.

UNIIT – IV

CLOSED CONDUCT FLOW: Reynold's experiment-Characteristic 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

BOUNDRY LAYER THEORY :Approximate Solution of Navier Stoke's equation-Boundry layer –Concept, Prandtl contribution, characteristics of boundry layer along a thin flat plate, Vonkarmen momentum integral equation, laminar and turbulent boundry layers (Introduction) BL in transition, separation of BL, Flow around submerged objects-Drag and Lift-Magnus effect.

Text Books:
1. Modi and Seth, " *Fluid Mechanics* ", Standard book house.Latest Edition
2. F M White "*Fluid Mechanics",* Tata Mc Graw Hill Publishers.2011.

Reference Books:
1. Dr.R.K.Bansal *"Fluid Mechanics and Hydraulic Machines",*Laxmi Publications.
2. Rajput *"Fluid Mechanics and Hydraulic Machines",*
3. A.K.Mohanty "*Fluid Mechanics* ", Prentice hall of India Pvt Ltd.
4. J.F.Douglas, J.M.Gaserek and J.A.Swaffirld (Longman), "*Fluid Mechanics*",

Outcomes :
After completion of this course, students will be able to….
1: Apply fundamental knowledge of mathematics to modeling and analysis of fluid flow problems in civil and environmental engineering.
2: Conduct Experiments (in teams) in pipe flows and open channel flows and documenting them in engineering reports.
3: Understand or become aware of disasters caused by an incorrect analysis in hydraulic Engineering system.
4: 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.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ3103) SURVEYING

B.Tech.II Year I-Semester-CIVIL   **L T P C**
                                                            4 0 0 4

 Objectives :
    1: Concepts of surveying using chain, compass & plane table
    2: Concepts of meridian, bearings inter: relationships
    3: Principles of Leveling, Methods of spirit leveling & plotting contours maps by various methods
    4: 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 .Priciples 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& Ashokkumar Jain, “*Surveying Volume I and II*”, LaxmiPublications, 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.

Outcomes:
    1: Describe the concepts of surveying
    2: Apprise compass and theodolite surveying
    3: Describe the concepts of leveling and its methods& discuss different methods to plot contour maps
    4: Describe the new and advance methods of surveying

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ3104) BUILDING MATERIALS, CONSTRUCTION& PLANNING

B.Tech. II Year- I Semester -CIVIL

L	T	P	C
4	0	0	4

Objectives :
1: Occurrence and existence of stone and preparation of brick
2: Classification of lime, composition of cement and properties of other building materials
3: Functional requirements of building and building components
4: 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
3. Relavent IS codes.

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.

Outcomes :

After completion of this course, students should be able to

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

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ3012) ENVIRONMENTAL STUDIES

B.Tech., II Year I Sem: CIVIL   **L   T   P   C**
                                                                     2   1   0   2

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.

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. **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. Threats to biodiversity: habitat 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 of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waste:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary.

UNIT-V
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.

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.

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, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology – Dr. M. Anji Reddy 2007, BS Publications.
6. The syllabus of Environmental Studies prescribed by UGC/JNTUH is approved for adoption.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ3105) STRENGTH OF MATERIALS LABORATORY

B.Tech. II Year I-Semester-CIVIL **L T P C**
                                        0 0 3 2

Objectives:
1: Study the uses of various types of testing machines and capacities
2: Test various materials against various types of straining actions for assessing the strength of materials
3: Approximate analysis of tall structures subjected to horizontal loading
4: 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

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

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ3106) SURVEYING LABORATORY - I

B.Tech. II Year-I Semester-CIVIL   **L T P C**
                                                               0 0 3 2

Objectives:

1: Learn and understand the various basic concept and principles used in surveying like Chain Surveying, Compass surveying, Plane Table Surveying and Leveling.

2:Learn and Understand various instruments used in surveying.

3: Learn and Understand how to calculate area of plot and ground.

4: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.

Outcomes:

1: Prepare map and plan for required site with suitable scale

2: Prepare contour map and estimate the quantity of earthwork required for formation level for road and railway alignment.

3: Judge which type of instrument to be used for carrying out survey for a particular area and estimate the area

4: Judge the profile of ground by observing the available existing map.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ3107) COMPUTER AIDED DRAFTING OF BUILDINGS LAB

B.Tech.II Year I-Semester-CIVIL   L T P C
                                                                       0 0 3 2

Objectives:
1: Use AutoCAD software
2: Use different commands to draw Building Drawings.
3: Draw different components of Doors and Windows
4: Draw different types of Trusses

List of Experiments:

1. Introduction to computer aided drafting.
2. Software for CAD-Introduction to different softwares.
3. Practice exercises on CAD software.
4. Drawing of plan of buildings using software
   a)Single storeyed buildings.   b)Multi storeyed buildings
5. Developing sections and elevations for
   a)Single storeyed buildings.   b)Multi storeyed buildings
6. Detailing of building components like doors, Windows, Roof, Trusses etc. Using CAD software.
7. Exercises on development of working of buildings.

Text Books:
1.Computer Aided Design Laboratory by M.N.Sesha Prakash & Dr.G.S.Servesh-Laxmi publication
2.Engineering Graphics by P.J.Sha-S.Chand & Co.

Outcomes:
1: Utilize basic measurement techniques of fluid mechanics and able to differentiate among measurement techniques their relevance and applications.
2: Draw and detailing of componenets of different types of Doors and Windows
3: Develop Working Drawing of Residential Building
4:Prepare drawing with details of roof trusses.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC AUTONOMOUS)

(AJ4005) PROBABILITY & STATISTICS

B.Tech II Year II Sem : CSE & CIVIL

L T P C
3 1 0 3

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 – Probabilty – 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 distribution . Mathematical Expectation, Moment about origin, Central moments Moment generating function of probability distribution.
Binomial , Poisson , Normal distribution and Exponential distributions.

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

UNIT-IV
Sampling Distributions and Testing of Hypothesis
Sampling: Definitions of population, sampling, statistic, parameter. types of sampling, Expected values of Sample mean and varience, sampling distribution, standard error, sampling distribution of means and sampling distribution of varience.

Parameter Estimations – Likelihood estimate, interval estimations.
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 varience & unknown varience, 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.
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 it's properties. Test of equality of two population variences

Chi-square distribution , it's properties, Chi-square test of goodness of fit .

UNIT- V

Queuing Theory :

Queuing Theory: Notation and assumption, Poisson Process queuing models with Poisson Process input - exponential service, infinite Queue-infinite source, single server model, infinite queue-infinite source, arrival Theorem – pure birth process and death process M/M/1 Model, finite queue-infinite source, single server model.

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 Sciences by Jay I. Devore.

References Books:
1. Mathematics for engineers series –Probability Statistics and Stochastic Process   by K.B.Datta and M.A. 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.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ4108) STRENGTH OF MATERIALS–II

B.Tech. II Year- II Semester -Civil

L T P C
4 1 0 4

Objectives:
   1: Various methods to evaluate slope and deflection
   2: Stresses developed in short and long columns and chimneys
   3: Analysis of statically indeterminate structures
   4: Apply the concept of pure torsion and different types of spring

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 dia, 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:
3. Timoshenko and Gere, "*Mechanics of Materials*", *PWS* Publishing Company, Boston, 4th edn., 1997.
4. 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

Outcomes :
   1: Analyze slope and deflection in beams subjected to loading
   2: Evaluate the stresses in long and short columns with various loading and boundary conditions
   3: Apply principles of Clapeyron's and Castigliano theorem in analyzing indeterminate structures
   4: Explore the behavior of springs and circular shafts subjected to loading

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS)

(AJ4109) CONCRETE TECHNOLOGY

B.Tech. II Year II-Semester-CIVIL   **L T P C**
                                                                        4 0 0 4

Objectives:
1:Use different types of cement as per their properties for different field applications.
2:Learn the methods of testing of aggregates.
3:Design economic concrete mix proportion for different exposure conditions and intended purposes.
4:Supervise various concreting operations.

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 significance – 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– relevant IS codal provisions.
CURING – significance – types of curing.

UNIT - IV
HARDENED CONCRETE : Water / Cement ratio – Abram's Law – Gelspace ratio –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength - relevant IS codal provisions..
TESTING OF HARDENED CONCRETE: Compression tests – Tension tests – Factors affecting strength – Flexure tests – Splitting tests – Pull-out test, Non-destructive testing methods – 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 - Factors effecting – Corbonation – Sulphate attack – Chloride attack- Alkalie aggregate reaction.

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 density concrete – Fibre reinforced concrete – Polymer concrete – High performance concrete – Self compacting concrete– relevant IS codal provisions..
Text books:
1. Properties of Concrete by A.M.Neville – Low priced Edition – 4th edition
2. Concrete Technology by M.S.Shetty. – S.Chand & Co. ; 2004
3. Relevant IS codes

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

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

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ4111) HYDRAULICS & HYDRAULIC MACHINERY

B.Tech.II Year II-Semester-CIVIL   L   T   P   C

                                                        4   1   0   4

 Objectives :
   1: Apply fundamental principles of fluid mechanics for the solution of practical Civil
      Engineering problems of water conveyance in open channels.
   2: Study, Analyze and Design of channels in uniform and Non-uniform flow conditions.
   3: 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.
   4: Study and Analyze different types and elements of Hydro Electric Power Plants.

UNIT – I

OPEN CHANNEL FLOW: Types of flows-Types 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 SIMLITUDE: Dimensional analysis-Rayleigh's method and Buckingham's π-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, expression for work done and efficiency-angular momentum principles, Applications to radial flow turbines.

UNIIT – IV

HYDRAULIC TURBINES: - Classification of Turbines - Heads and efficiencies 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 speed multistage 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. Layout of a typical hydropower plant installation

Text Books:
3. K.Subramanya, " *Open Channel flow*", Tata Mc Graw Hill Publishers.
4. Modi &Seth "*Fluid Mechanics& Hydraulic Machines",* Standard book house.

Reference Books:
5. D.S.Kumar *"Fluid Mechnanics & Fluid power Engineering ",* Kataria & Sons Book Co.
6. Banga & Sharma *"Hydraulic Machines",* Khanna Publications
7. Ranga Raju "*Elements of open channel flow*", Tata Mc Graw Hill Publishers.
8. V.T.Chow, "*Open Channel Flow*", Tata Mc Graw Hill book company.

Outcomes :
After completion of this course, students will be able to….
1: Apply fundamental knowledge of fluid mechanics in solving problems and making design of open channel hydraulics in civil and environmental engineering.
2: Describe and apply dimensional analysis and similarity to develop hydraulic models and testing.
3: Understand the basics of hydraulic machinery and their operation design in water distribution systems.
4: Select and design appropriate pumps, classification, identify and design of hydraulic turbines and their application in Hydro Electric Power Plants.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ4203) BASIC ELECTRICAL & ELECTRONICS ENGINEERING

B.Tech II Year I SEM: CIVIL & MECH   L   T   P   C
                                                           3   0   0   3

Course Objective:
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 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.

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 – Qualitative theory of P-N Junction, P-N Junction diode, V-I characteristic(Forward and Reverse), Temperature dependence, Ideal versus practical, Static and dynamic resistances.
Rectifiers and Filters - The P-N junction as a rectifier - A Half Wave Rectifier, Ripple Factor, Full Wave Rectifier, Bridge Rectifier, Filters-Inductive and Capacitive with qualitative analysis.

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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ4112) FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

B.Tech. II YEAR-IISemester-CIVIL& EEE

L	T	P	C
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Objectives:

1: Compare the result of analytical models introduced in lecture to the actual behavior of real fluid flow

2: Discuss and practice standard measurement techniques of fluid mechanics and their applications.

3: Familiarize the students with the componenets and working principles of the Hydraulic machines-different types of turbines, Pumps, amd other miscellaneous hydraulics machines.

4: Learn and practice writing technical reports and to work on small design projects.

List of Experiments:

1. Calibration of Venturimeter & Orificemeter
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 test on Kaplan Turbine.
12. Performance characteristic of a single stage/multi stage centrifugal pump.
13. Performance characteristic of a reciprocating pump.

Outcomes:

1: Utilize basic measurement techniques of fluid mechanics and able to differentiate among measurement techniques their relevance and applications.

2: Demonstrate Practical understanding of minor and friction losses in pipe flows.

3: Demonstrate practical working of hydraulic machines-different types of Turbines, Pumps, and other miscellaneous hydraulics machines.

4: 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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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ4113) SURVEYING LABORATORY - II

B.Tech.II Year II-Semester-CIVIL   **L T P C**
                                                                          0 0 3 2

Objectives:
   1: Learn and understand the use of theodolite for different angles and method
   2: Learn and understand the use of Levelling instrument for different problems
   3: Learn and understand the setting out works and curves using theodolite and leveling
      instrument.
   4: Learn and understand the using of Total Station

List of Exercises:

   1. Study of theodolite in detail-practice for measurement of horizontal and vertical angles
   2. Measurements of horizontal angles by method of repetition and reiteration
   3. Trigonometric Leveling-Heights and distance problems (Two Exercises)
   4. Height and distance using Principles of tachometric surveying (Two Exercises)
   5. Curve Setting-different methods (two Exercises)
   6. Setting out works for buildings & pipe lines
   7. Determination of area using total station
   8. Contouring using total station
   9. Determination of remote height using total station
   10. State-Out using total station
   11. Distance, gradient, Diff, height between two inaccessible points using total stations.

Outcomes:
   1: Explore to carrying out survey using theodolite for different methods
   2: Explore to carrying out leveling using leveling instrument for different methods
   3: Explore to learn the setting out works and curve setting.
   4: Explore to learn advance method of surveying using total station

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS)

(AJ4204) BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

B.Tech II Year II Semester CIVIL & MECH   **L T P C**

                                                              0 0 3 2

List of Experiments:

1. Verification of Kirchhoff's Laws.

2. Verification of superposition and Reciprocity Theorems.

3. Verification of Maximum Power transfer theorem.

4. Experimental Determination 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 phase transformer.

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)

Note: Student should perform 11 experiments out off 13 experiments. Experiments 7 & 8 are optional.

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JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC - AUTONOMOUS)

(AJMC01) GENDER SENSITIZATION
(An Activity – based Course)

II Year B. Tech, II Semester Common to All Branches   **L T P C**

                                                                   0 0 3 0

Objectives of the Course:
- To develop students sensibility with regard to issues 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.

Learning 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.

Unit – I

UNDERSTANDING GENDER:
Gender: Why should we study it? (Towards a world of Equals: Unit – 1)
Socialization: Making women, making men (Towards a World of Equals: Unit – 2)
Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.
Just Relationships: Being Together and Equals **(Towards a World of Equals: Unit – 12)**
Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Further Reading: Rosa Parks – The Brave Heart.

Unit – II
GENDER AND BIOLOGY:
Missing Women: Sex Selection and its Consequences(Towards a World of Equals: Unit – 4)
Declining Sex Ratio. Demographic Consequences.
Gender Spectrum: Beyond the Binary (Towards a World of Equals: Unit – 10)
Two or Many? Struggles with Discrimination.
Additional Reading: **Our Bodies, Our Health (Towards a World of Equals: Unit – 13)**

Unit – III

GENDER AND LABOUR:
Housework: the Invisible Labor (Towards a World of Equals: Unit – 3)
 "My Mother doesn`t Work". *Share the Load*.
Women`s Work: Its Politics and Economics (Towards a World of Equals: Unit – 7)
Fact and Fiction. Unrecognized and Unaccounted work.
Further Reading: Wages and Conditions of Work

Unit – IV

ISSUES OF VIOLENCE:
Sexual Harassment: Say No! (Towards a World of Equals: Unit – 6)
Sexual Harassment, not Eve – teasing – Coping with Everyday Harassment – Further Reading:
"Chupulu" **Domestic Violence: Speaking Out (Towards a World of Equals: Unit – 8)**
Is Home a Safe Place? – When Women Unite [Film]. Rebuilding Lives. Further Reading. New
Forums for justice.
Thinking about Sexual Violence (Towards a World of Equals: Unit – 11)
Blaming the Victim – "! Fought for my Life ……" – Further Reading. The Caste Face of
Violence.

Unit – V

GENDERS STUDIES:
Knowledge: Through the Lens of Gender (Towards a World of Equals: Unit – 5)
Point of View. Gender and the Structure of Knowledge. Further Reading. Unacknowledged
Women Artists of Telangana
Whose History?Questions for Historians and Others(Towards a World of Equals: Unit – 9)
Reclaiming a Past. Writing other Histories. Further Reading. Missing Pages from Telangana
History.

Essential Reading: All the Units in the Text books, "Towards a World of Equals: A Bilingual
Textbook on Gender" Written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama
Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu.
 Note: Since it is Innterdisciplinary Course, reasource Persons can be drawn from the fields of
English Literature of Sociology or Political Science or any other qualified faculty who has
expertise in this field.

Reference Books:
    1. Sen, Amartya. "More than Once Million Women are Missing". New York Review of
       Books 37.20 (20 December 1990). Print. `We Were Making History……' Life Stories
       of Women in the Telangana People`s Struggle. New Delhi : Kali for Women, 1989.

2. Gautam, Liela and Gita Ramaswamy. "A 'Conversation' between a Daughter and Mother". Broadsheel on Contemporany Politics. Special Issue on Sexuality and Harassment: Gender Politics on Campus Today. Ed.Madhumeeta Sinha and Asma Rasheed. Hydrabad: Anveshi research Center for Women`s Studies, 2014.

3. Abdulali Sohaila. " I Fought For My Life…and Won." Abailable online at: http://www.thealternative. In/lifestyle/i-fought-for-my lifeand-won-sohaila-abdulal/

4. Jeganathan Pradeep, Partha Chatterjee (Ed). "Community, Gender and Violence Subaltern Studies XI". Permanent Block and Ravi Dayal Publishers, New Delhi, 2000

5. K. Kapadia. The Violence of Development: The Politics of Identity, Gender and Social Inequalities in India. London: Zed Books, 2002.

6. S. Benhabib. Situating the self: Gender, Community, and Postmodernism in Contemporary Ethics, London:Routledge, 1992.

7. Virginia Woolf A Room of One`s Oxford: Black Swan. 1992.

8. T. Banuri and M. Mahmood, Just Development: Beyond Adjustment with a Human Face, Karachi: Oxford University Press, 1997.

9. Tripti Lahiri. "By the Numbers: Where India Women Work." Women`s Studies Journal (14 November 2012) Available online at: http://blogs. Wsj.com/India real time/2012/11/14/by – the –numbers – where- Indian- women-works/>

10. K. Satyanarayana and Susie Tharu (Ed.) Steel Nibs Are Sprouting: New Dalit Writing From South India, Dossier 2: Telugu And Kannada http://harpercollints.co.in/BookDetail.asp?Book Code=3732

11. Vimala "Vantilu (The Kitchen)". Omen Writing in India: 600BC to the Present, Volume II The 20th Century. Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 599-601.

12. Shatrughna, Veena et al. Women`s Work and its Impact on Child Health and Nutrition, Hyderabad, National Institute of Nutrition, India Council of Medcial Research 1993.

13. Stress Shakti Sanghatana. "We Were Making History….'Life Stories of Women in the Telangana People`s Struggle. New Delhi:Kali of Women, 1989.

14. Menon, Nivedita. Seeing Like a Feminist. New Delhi. Zubaan-Penguin Books, 2012.

15. Jayaprabha, A. "Chupulu (Stares)". Women Writing in India: 600BC to the Present. Volume II: The 20th Century Ed. Susie Tharu and K. Lalita. Delhi: Oxford University Press, 1995. 596-597.

16. Javeed, Shayam and Anupam Manuhaar. "Women and Wage Discrimination in India: A Critical Analysis". International Journal of Humanilities and Social Science Invention 2, 4(2013).

B.TECH

III YEAR

I & II SEMESTER SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC - AUTONOMOUS, Affiliated to JNTUH)

(AJ5114) DESIGN OF REINFORCED CONCRETE STRUCTURES

B.Tech.III Year I-Semester-Civil   **L / T / P / C**
                                                                    4 / 1 / 0 / 4

Objectives:
This course will develop students' knowledge in/on
    1: Concepts of limit state method of design
    2: Design of reinforced concrete beams for collapse in serviceability limit state
    3: Design of slabs and columns using limit state design
    4: Design of footings, stair cases and
    5: Concept of working stress method

UNIT – I
Fundamentals of Limit State Design: Introduction to reinforced cement concrete, Loads on structures, Methods of design, Code of practice, Stress-strain curves of concrete, Mild steel and Tor steel, Grades of concrete as per IS: 456-2000, Characteristic loads and strengths , Partial safety factors.

Limit State of Collapse in Flexure: Analysis and design of Beams, Singly, doubly reinforced rectangular and flanged sections.

UNIT – II
Shear and Torsion: Shear, torsion, bond and development length.

Limit State of Serviceability: Check for short term deflection for determinate beams, Long term deflection due to creep, Long term deflection due to differential shrinkage.

UNIT – III
Slabs: Design of one way simply supported and continuous slabs and two way slabs as per IS: 456-2000.

Columns: Axially loaded rectangular columns, circular columns with lateral ties and helical reinforcement, axially loaded short columns with uni-axial bending moment.

UNIT – IV
Footings: Design of isolated footing for axially loaded columns, Design of combined footing.

Design of dog legged staircase: Introduction, Types of staircases, Loads on stair case slabs, Design of dog legged staircase.

UNIT – V
Working Stress Method of Design: Design Principles, under reinforced, balanced and over-reinforced beams, Analysis and design of rectangular beams, Design for shear.

Text Books:
1. A.K. Jain, "Limit State Design", Nem Chand Brothers, Roorkee.
2. S. Unnikrishna Pillai and Devdas Menon, "Reinforced Concrete Design", Tata Mc.Graw-Hill Publishing Company Limited, New Delhi.
3. N.Subramanyam " Reinforced Cocrete Structures" Oxford Higher Education Press.

Reference Books:
1. Jai Krishna and O.P. Jain, "Plain and Reinforced Concrete", Nem Chand Brothers, Roorkee.
2. B.C. Punmia, "Reinforced Concrete Structures", Laxmi Publishing Company, New Delhi.
3. IS 456, "Code of practice for Plain and reinforced concrete", Bureau of Indian standards, New Delhi, 2000.
4. IS 875 (part 1-5), "Code of practice for Design loads", Bureau of Indian standards, New Delhi, 1987.

Outcomes:
After completion of this course, students will be able to….
1: Explain the general mechanical behavior of reinforced concrete
2: Analyze and design reinforced concrete flexural members
3: Design one way, two way slabs and columns
4: Design footings and staircase
5: Summarize working stress method

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ5115)   STRUCTURAL ANALYSIS – I

B.Tech.III Year I-Semester-Civil

L / T / P / C
4 / 1 / 0 / 4

Objectives:
This course will develop students' knowledge in/on
1: Distribution of forces at joints
2: Approximate analysis of tall structures subjected to horizontal loading
3: The variation of internal forces in a structural member for moving loads
4: Influence line diagram

UNIT – I
Energy Theorem: Introduction, strain energy in linear Elastic system, expression of strain energy due to axial load, Castiglione's first theorem-unit load method. Deflections of simple beams and pin-jointed plane trusses. Deflections of statically determinate frames.
Indeterminate Trusses: Determination of Static and kinematic indeterminacies, Analysis of trusses having single and two degrees of internal and external indeterminacies- Castigliano's second theorem.

UNIT – II
Slope Deflection Method: Development of SD Equation, sign convention, construction of bending moment diagrams Claperyon's theorem of three moments, analysis of continuous beams, rectangular portal frame, effect of yielding and sinking of support, frame with side Sway, and principle of symmetry

UNIIT – III
Moment Distribution Method: Introduction, Distribution and carryover factor, Application to continuous beams, sinking and yielding of support, portal frame, frame with side Sway, principle of symmetry .Analysis of inclined frames.

UNIT – IV
Moving Loads: Maximum BM and SF diagrams for simple beams traversed by single point load, a pair of point loads, uniformly distributed load shorter and longer than the span, system of point loads, Absolute maximum bending moment and absolute maximum shear force enveloping parabola and equivalent UDL.

UNIT – V
Influence Line Diagrams: Influence line diagram for support reaction, bending moment and shear force for simple and over hanging beams, for girders with cross beams, ILD for stresses in members for warren girder and Pratt truss with sloping shed, for deck and trough type bridges, focal length and counter bracing.

Text Books:
1. C.S.Reddy, "Basic Structural Analysis", Tata Mc Graw Hill Education Pvt. Ltd., New Delhi.
2. Pandit and Gupta, "Structural Analysis vol-1 and vol 2", Tata Mc Graw Hill Publishers.

Reference Books:
1. C.K. Wang "Indeterminate Structural Analysis", McGraw Hill Book Co.
2. B.C. Punmia, A.K.Jain and A.K.jain "Theory of Structures", Laxmi Publications, New Delhi.
3. Vazrani and Ratwani, " Structural Analysis vol-1 and vol 2", Khanna Publishers.

4. S. Ramamrutham and R. Narayan "Theory of Structures", Dhanpat Rai.

Outcomes:
After completion of this course, students will be able to….

1: The distribution of forces at joints and also developing net bending moment and shear force diagrams for indeterminate structures

2: Analyze the tall structures using approximate analysis for horizontal loads

3: Draw the variation of internal forces in structural members for moving loads

4: Draw line diagram for the Support reaction, beams, girders.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ5116) ENGINEERING GEOLOGY AND ROCK MECHANICS

B.Tech.III Year I-Semester - Civil   **L / T / P / C**
                                                                      3 / 0 / 0 / 3

Objectives:
1. To learn about weathering and its effects on rocks and Minerals
2. To know different rocks and the various tests to be done on them..
3. To study about geological structures, geological maps and investigations on ground water table.
4. To understand the geological problems associated with earthquakes, landslides and reservoir.
5. To know the geological analysis of dams and tunnels.

UNIT-I:
General Geology: Introduction to geology Branches and Scope of geology, Surface Futures and internal structure of earth, Importance of geology from civil engineering point of view, Brief study of case histories of failures of some civil engineering constructions due to geological drawback, weathering of rocks and its end product.

UNIT-II:
Mineralogy: Definition of mineral, Importance of minerals, Different methods of study of minerals, Advantages of study of minerals by Physical properties and occurrence of Quartz and its Varieties Feldspar, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chloritr, Kyanite,Garnet, Talc, Calcite, Study of other common economic minerals such as Pyrite, Hematite, Magnetite, Chrorite, Galena, Pyrolusite, Graphite, Magnetite and Bauxite.

UNIT-III:
Petrology: Formation and classification of rocks, Texture and Structure, Physical properties of rocks for Construction purposes, Engineering properties of rocks , Test for rocks as building stone, Aggregate , Foundation stone, Dimensional and Ornamental rocks, Geological classification of rocks-Igneous, Sedimentary and Metamorphic rock, Megascopic and Microscopic study of granite , Dolorite, Basalt, Pegmatite, Laterite, Conglomerate, Sandstone, Shale, Limestone, Gnesis, Schist, Qurtzite, Marble and Slate, Rock Excavation, Stone aggregates.

UNIT-IV:
Rock Mechanics: Introduction, Structural features like Stratification, Lamination, Bedding planes, Dip, Strike, Fault, Folds, Schirtosity joint and their measurements-unconformities, overlaps, inliers, outliers, Importance of structure in civil activities.
Natural Hazardous: Causes and effect of Earthquake and Landslides, Remedial measures to prevent damage to engineering structure, Causes and remedial measures of soil Erosion.
Geological And Geophysical Investigation: Interpretation of geological maps, Use of Aerial maps and remote sensing imaginaries in natural resources surveying, geological methods as applied to civil engineering for subsurface analysis.

UNIT-V:

Dams: Types of dams, Requirements of Dam sites, Reconnaissance-Preliminary and detailed geological investigation for dam site. Geologyof the major dam site of India-Leakage and Silting of Reservoirs-Remedial measures.

Tunnels: Purpose of tunneling and geological problems connected with tunneling-Geothermal step, over break, Logging of tunnel and its necessity.

Text Books:
1. N. Chenna Keshavulu, "Textbook of Engineering Geology", Macmillan Publishers, New Delhi.
2. Parbin Singh, "Engineering and General Geology", S.K. Kataria and Sons, New Delhi.

References:
1. K.V.G.K. Gokhale, "Principles of Engineering Geology", BS Publications, Hyderabad.
2. B.S.S. Narayanaswamy, "Engineering Geology", Dhanpat Rai and Co, New Delhi.

Outcomes:
On completion of this course, students will be able to
1. Identify various minerals
2. Classify different rocks
3. Interpret geological maps and Explore ground water table investigations
4. Describe in detail about earthquakes, landslides and reservoirs
5. Describe in detail about geological aspects of dams and tunnels.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ5117) SOIL MECHANICS

B.Tech.III Year I-Semester - Civil

L / T / P / C
3 / 1 / 0 / 3

Objectives:
1. To know the identification and classification of soils
2. To learn about Permeability, seepage and compaction
3. To understand about consolidation settlements
4. To learn the stress distribution in soils
5. To know the shear strength parameters

UNIT – I:
Basic definitions and phase relationships: Introduction - Soil formation, Soil structure, Definitions of rock, soil and soil mechanics and Soil problems, Phase diagrams, Water content, Specific gravity, Void ratio, Porosity, Degree of saturation, Density of soil, Mass, weight, volume relationships, Relative density.

Identification and classification of soils: Sieve analysis, Stoke's law and its limitations, Grain size distribution curves, Atterberg limits, IS classification of soils, Field identification of soils consistency of soils, Activity, Thixotrophy, Liquidity index, Consistency index and Hydrometer analysis.

UNIT – II:
Permeability and Seepage: Darcy's law and its limitations, Determination of coefficient of permeability, Coefficient of permeability for different soils, Factors affecting permeability of soils, Permeability of stratified soils, Laplace's equation, Stream and potential functions, characteristics of flow net, Construction of flow net, Uses of flow net, Flow net for Anisotropic soils.

Compaction: Mechanism of compaction, Proctor's compaction test, Zero air voids curve, Factors affecting compaction, Effect of compaction on soil properties, Field compaction, and Percentage compaction.

UNIT – III:
Consolidation: Mechanism of consolidation, Characteristic compression curves, Basic definitions, Normal, under and over consolidated clays, Terzaghi's one dimensional consolidation theory- Assumptions, Derivation, Determination of consolidation properties of soils, Magnitude and rate of consolidation settlements.

UNIT – IV:
Stress distribution: Need for finding of stress distribution in soils - Assumptions in elastic theories - Boussinesq equation for point, line, circular and rectangular loads, Westergaard's analysis for point load, Concept and use of pressure bulb - Principle and use of Newmark's influence chart, Contact pressure distribution under rigid and flexible footings in sand and clay.

Shear strength: Introduction, Normal and Shear stresses, Mohr's circle characteristics of Mohr's circle, Mohr-Coulomb theory and Revised Mohr-Coulomb equation.

UNIT – V:
Shear parameters of soils: Direct shear test, unconfined compression test, Tri axial test, Vane shear test, Importance of drainage conditions, Consolidated Drained, Consolidated Undrained and Unconsolidated Undrained shear tests, Factors affecting the shear strength of clays and sands, Liquefaction, Critical void ratio.

Text Books:
1. K.R. Arora," Soil Mechanics and Foundation Engineering", Standard Publishers, New Delhi.
2. C. Venkatramaiah, "Geotechnical Engineering", New Age Publications.

References:
1. Shenbaga R Kaniraj, "Design Aids in Soil Mechanics and Foundation Engineering", Tata McGraw Hill Education Private Limited, New Delhi.
2. T.W. Lambe and Whiteman, R.V "Soil Mechanics", New Age Publications.

Outcomes:
On completion of this course, students will be able to
1. Classify the soils
2. Determine permeability, optimum moisture content and maximum dry density
3. Determine consolidation characteristics of a given soil
4. Identify shear strength parameters of different soils

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS, Affiliated to JNTUH)

(AJ5134)   ENGINEERING HYDROLOGY
(Professional Elective – I)

B.Tech.III Year I-Semester - Civil   **L / T / P / C**
                                                      3 / 1 / 0 / 3

Objectives:
1. To know the Hydrologic cycle and analysis of rainfall data.
2. To understand Evaporation, Infiltration and runoff.
3. To learn Characteristics of Hydrograph and Ground water hydraulics.
4. To know the Principles of flood routing in reservoirs
5. To understand Aquifers and its types and uses

UNIT – I:
Elements of Hydrology: Definition, Hydrologic cycle, Water budgeting, Water potential in India.

Precipitation and its Measurement: Types of Precipitation, Recording & Non-recording type of rain gauges-errors in measurement - Location of rain gauges. Analysis of rain falls data by mass curves, Hyetograph, Intensity duration analysis, Estimation of missing precipitation data, Consistency test of data by double mass curve technique, Probable maximum precipitation.

UNIT – II:
Evaporation and Evapotranspiration: Factors affecting the processes and their estimation, Pan evaporation, Blaney Criddle, Hargreaves, Penmann and Lysimeter methods, Methods of reducing evaporation from reservoirs.

Infiltration and Runoff: Factors affecting infiltration, measurements of infiltration, infiltration indices, Factors affecting runoff, Estimation of runoff from rainfall, Flow duration curve and mass curve and their uses.

UNIT – III:
Hydrograph analysis: Characteristics of hydrograph, separation of base flow, Unit hydrograph, S-Curve hydrograph, Synthetic unit hydrograph, and Dimensionless unit hydrograph.

Groundwater: Types of Aquifers-Unconfined and Confined Aquifers, Well Hydraulics, Recuperation test for yield of open well.

UNIT – IV:
Floods: Rating curve and its extension, reservoir routing, Establishing Storage-Discharge relationship, I.S.D method, channel routing-Muskingum Method, determination of Muskingum parameters k and x.

Design Flood: Methods of estimation of design flood empirical formulae, rational method, Frequency analysis, Gumble's distribution and unit Hydrograph method.

UNIT – V:

Aquifers: Ground water occurrences, 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 Mc Graw Hill Book Co., New Delhi.
2. P. Jayarami Reddy, "A Textbook of Hydrology", Laxmi Publishers, New Delhi.

References:
1**.** R.K. Linsley, M.A. Kohler & J.L.Paulus, "Hydrology for Engineers", Mc Graw Hill Book Co,New Delhi.
2. R.S. Varshney, "Engineering Hydrology", Nemchand Bros., Roorkee.
3. H.M. Raghunath,"Hydrology", New Age International Pulishers, New Delhi.

Outcomes:
On completion of this course, students will be able to
1. Describe Hydrologic cycle and Analyze rainfall data
2. Estimate Evaporation, Infiltration & runoff
3. Examine Characteristics of hydrograph & Compute ground water hydraulics
4. Apply Principles flood routing in reservoirs
5. Describe Aquifers, their parameters and uses

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(UGC-AUTONOMOUS, Affiliated to JNTUH)

(AJ5135) PRE STRESSED CONCRETE
(Professional Elective – I)

B.Tech.III Year I-Semester-Civil

L / T / P / C
3 / 1 / 0 / 3

Objectives:
This course will develop students' knowledge in/on
1: Prestressing of concrete and their losses
2: Analysis and design of sections in flexure
3: Transfer of prestress and design in shear
4: Analysis of indeterminate prestressed concrete members.

UNIT – I
Prestressing Systems: Historical development, concepts of pre-stressing, Advantages, Pre-tensioning and Post-tensioning, Prestressing Systems-Hoyer, Freyssinet, Magnel blaton and Lee-Mc call system, material properties, Need for High strength steel and High strength concrete.

Analysis of Sections: Stress concept, Strength concept, Load balancing concept, Effect of loading on the tensile stresses in tendons, Effect of tendon profile on deflections, Factors influencing deflections, Calculation of Short term and long term deflections.

UNIT – II
Losses of Prestress: Loss of prestress in pre-tensioned and post-tensioned members due to various causes like elastic shortening of concrete, shrinkage of concrete, creep of concrete, relaxation of steel, slip in anchorage, bending of member and frictional loss.

Design of Section for Flexure: Allowable stresses, Elastic design of simple beams having rectangular and I-section for flexure, kern lines, Cable profile and cable layout.

UNIT – III
Design of Section for Shear: Shear and Principal Stresses, Improving shear resistance by different prestressing techniques, horizontal, sloping and vertical prestressing, Analysis of rectangular and I–beam, Design of shear reinforcement, Indian code provisions.IS:1343-2012

Transfer of Prestress: 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 approximate, Guyon and Magnel methods, Anchorage zone reinforcement.

UNIT – IV
Composite Beams: Different types –Propped and Unpropped, Stress Distribution, different shrinkage, Analysis of composite beams, general design Consideration.

Deflection: Importance of control of deflection, factors influencing deflection, short term deflection of uncracked beams-prediction of long term deflection, BIS code requirements.

UNIT – V
Statically Indeterminate Structures: Advantages & disadvantages of continuous PSC beams, primary and secondary moments – P and C lines, Linear transformation concordant and nonconcordant cable profiles, Analysis of continuous beams and simple portal frames.

Prestressed concrete poles: General Features, advantages, shapes of PSC poles, Design considerations, partially prestressed pretension poles.

Text Books:
1. Krishna Raju N, "Prestressed concrete", Tata McGraw Hill Company, New Delhi.
2. Mallic S.K. and Gupta A.P., "Prestressed concrete", Oxford and IBH publishing Co. Pvt. Ltd, 4th edn., 1987.

Reference Books:
1. Lin T.Y. "Design of prestressed concrete structures", John Wiley and sons and Asia Publishing House, Mumbai, 3rd edn., 1982.
2. G. S.Ramaswamy "Modern prestressed concrete design", Arnold Heinimen, New Delhi.
3. N. Rajagopalan "Prestressed Concrete", Alpha Science publishers, New Delhi.
4. ED Nawy "Fundamentals of PreStressed Concrete

Outcomes:
After completion of this course, students will be able to….
1: Appraise the concept of Prestressing in concrete
2: Design prestressed concrete members in flexure
3: Appreciate the transfer of prestress in concrete
4: Analyze a continuous beam and design beams and poles.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ5136) REMOTE SENSING AND GIS
(Professional Elective – I)

B.Tech.III Year I-Semester - Civil

L / T / P / C
3 / 1 / 0 / 3

Objectives:
1. To know Basic concepts of remote sensing, aerial photography and photogrammetry.
2. To learn Basic Principles of Remote Sensing and Techniques.
3. To understand various types of remote sensing and image interpretation.
4. To study the Components of GIS and its representation, scale of level of measurement.
5. To know different data models.

UNIT – I:
Fundamentals of Photogrammetry: Introduction to Aerial photography, Purpose of photography, Types of aerial photography, Scale of photography Time and Season of photography. Basic Geometric characteristics of Aerial photographs resolution of Aerial photos, Tilt and relief displacement.

Aerial Photography and Photogrammetry: Introduction, Terrestrial and Aerial photographs, Vertical and Oblique photographs, Height determination contouring, Photographic Interpretations, Stereoscopy, Parallax bar, Flight Planning- Photo Interpretation.

UNIT – II:
Fundamentals of Remote Sensing: Process of remote sensing, Characteristics, Measurement and Interaction of Electromagnetic radiation (EMR) with earth surface, Image, Pixel and Swath. Remote sensing satellite, Orbits, Sensors and Resolution. Image restoration and Image enhancement.

Remote Sensing Technique: Physics of Remote Sensing, Energy Interactions with Earth Surface Features of Vegetation, Water and Soil, Energy Interactions with Atmosphere.

UNIT – III:
Image Interpretation: Introduction- Active, Passive, Optical Remote sensing, visible, infrared, thermal, sensors and characters. Concept of Microwave remote sensing, SLAR, SAR Scattrometers- Altimeter, Characteristics, Image interpretation characters.

Multi Band Images: Advantages of multi date and multi band images, Digital image processing concepts, Pre-processing, Image enhancement and Classification fundamentals.

UNIT – IV:
Introduction to GIS: Introduction, Concepts , Information system , Components of GIS, Geospatial data architecture, Geographic co ordinate systems, Map projections, Input data for GIS, level and Scale of measurement, Importance of data quality.

GIS data processing: GIS data types, Data Representation, Data sources, Typical GIS data sets, Data Acquisition.

UNIT – V:

Vector Data Model: Representation of simple features, Topology and its importance, Coverage and its data structure.

Raster Data Model: Elements of raster data model, Types of Raster data , Raster data structure.

Text Books:
   1. M. Anji Reddy, "Textbook of Remote Sensing and Geographical Information systems", BS Publications, Hyderabad.
   2. A.M.Chandra and S.K. Gosh. "Remote Sensing and GIS", Narosa Publishing Home", New Delhi.

References:
   1. Kang-tsung Chang, "Introduction to Geographical Information System", Tata McGraw Hill, 4th edn..
   2. Paul A. Longley, Micheal F. Goodchild, David J. Magaine David J.Magaine, David W Rhind, "Geographical Information System" Vol. I and II, John wiley and Sons Inc.

Outcomes:

On completion of this course, students will be able to
   1. Explain the Basic Principles of Remote Sensing and Techniques.
   2. Describe the remote sensing and interpretation technique.
   3. Describe the various types of remote sensing and image interpretation.
   4. Illustrate the components of GIS and its representation.
   5. Know the sources of data and data acquisition.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC - AUTONOMOUS, Affiliated to JNTUH)

(AJ5118) ENGINEERING GEOLOGY LAB

B.Tech.III Year I-Semester - Civil

L / T / P / C
0 / 0 / 3 / 2

Objectives:
This laboratory courses will develop student's knowledge in/on
1. Identify the mineral name by studying the properties
2. Identify the rocks name by studying the properties
3. Interpretation of geological maps

List of Exercises:
1. Study of physical properties and identification of minerals.
2. Study of physical properties and identification of Igneous rocks
3. Study of physical properties and identification of Sedimentary rocks
4. Study of physical properties and identification of Metamorphic rocks
5. Interpretation and drawing of sections for geological maps showing tilted beds, faults, uniformities etc.
6. Simple Structural Geology problems

Text Books:
1. N. Chenna Keshavulu, "Textbook of Engineering Geology", Macmillan Publishers, New Delhi.
2. Parbin Singh, "Engineering and General Geology", S.K. Kataria and Sons, New Delhi.

References:
1. K.V.G.K. Gokhale, "Principles of Engineering Geology", BS Publications, Hyderabad.
2. B.S.S. Narayanaswamy, "Engineering Geology", Dhanpat Rai and Co, New Delhi.
11.

Outcomes:
On completion of this laboratory course, students will be able to
1. Identify various Minerals
2. Identify the rocks
3. Interpret and draw the sections for geological maps showing horizontal beds, vertical beds, inclined beds, folds, faults, unconformities

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC - AUTONOMOUS, Affiliated to JNTUH)

(AJ5119) CONCRETE TECHNOLOGY LABORATORY

B.Tech. III Year I-Semester-Civil   L / T / P / C
                                                                                                        0 / 0 / 3 / 2

Objectives :
This laboratory course will develop students' knowledge in/on
1: Testing of cement
2: Testing of fine aggregates and coarse aggregates
3: Testing of fresh and hardened concrete
4: Non-destructive testing of concrete

LIST OF EXPERIMENTS

1. Fineness of Cement
2. Specific Gravity of Cement
3. Soundness of Cement
4. Standard Consistency of Cement
5. Initial and Final Setting Times of Cement
6. Compressive Strength of Cement
7. Fineness Modulus of Fine and Coarse Aggregates
8. Bulk Density, Specific gravity, Porosity and Void ratio of Fine Aggregate and Coarse Aggregate
9. Bulking of Fine Aggregate
10. Workability of Fresh Concrete
11. Tests on Hardened Concrete
 a) Compressive Strength   b) Split Tensile Strength c) Modulus of rupture

12. Young's Modulus of Concrete
13. Demonstrate Non- Destructive Testing of Concrete (Rebound Hammer Test)

Laboratory Manual:
1. "Concrete Technology Laboratory Manual", prepared by faculty of Department of Civil Engineering.
2. Relevent IS Codes.

Text Books:
1. M.L. Gambhir, "Concrete Technology", Tata McGraw-Hill, New Delhi, 5th edn.
2. M.S. Shetty, "Concrete Technology (Theory and Practice)", S. Chand Company, New Delhi, 7th edn.
3. A.R. Santhakumar, "Concrete Technology", Oxford Publishers, 1st edn.
4. A.M. Neville, "Properties of Concrete", Mc Graw Hill Publications, New Delhi, 5th edn.`

Outcomes :
After completion of this laboratory course, students will be able to
1: Interpret laboratory testing results of cement for construction
2: Interpret laboratory testing results of fine aggregate and coarse aggregate for construction

3: Interpret laboratory testing results of fresh and hardened concrete for construction
4: Demonstrate various methods of non-destructive testing of concrete

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJMC02) VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURE

B.Tech. III Year I-Semester- Civil   L / T / P / C
                                                                         2 / 0 / 0 / 0

Module 1: Values and Self Development-Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non moral valuation, Standards and principles, Value judgments. Importance of cultivation of values, Sense of duty, Devotion, Self reliance, Confidence, Concentration, Truthfulness, Cleanliness, Honesty, Humanity, Power of faith, National unity, Patriotism, Love for nature, Discipline.

Module 2: Personality and Behavior Development- Soul and scientific attitude, God and scientific attitude, Positive thinking, Integrity and discipline, Punctuality, Love and kindness, Avoiding fault finding, Free from anger, Dignity of labor, Universal brotherhood and religious tolerance, True friendship, Happiness vs. suffering love for truth, Aware of self destructive habits, Association and cooperation, Doing best, Saving nature.

Module 3:Character and Competence- Science vs. God, Holy books vs. blind faith, Self management and good health, Science of reincarnation, Equality, Nonviolence, Humility, Role of women, All religions and same message, Mind your mind, Self control, Honesty, Studying effectively.

Module 4:Human Rights- Jurisprudence of human rights nature and definition, Universal protection of human rights, Regional protection of human rights, National level protection of human rights, Human rights and vulnerable groups.

Module 5: Legislative Procedures- Indian constitution, Philosophy, fundamental rights and duties, Legislature, Executive and Judiciary, Constitution and function of parliament, Composition of council of states and house of people, Speaker, Passing of bills, Vigilance, Lokpal and functionaries.

Text Books:
 1. Chakraborty, S.K., Values and Ethics for Organizations Theory and Practice, Oxford University Press, New Delhi, 2001.
 2. Kapoor, S.K., Human rights under International Law and Indian Law, Prentice Hall of India, New Delhi, 2002.
3. Basu, D.D., Indian Constitution, Oxford University Press, New Delhi, 2002.

References:
1. Frankena, W.K., Ethics, Prentice Hall of India, New Delhi, 1990.
2. Meron Theodor, Human Rights and International Law Legal Policy Issues, Vol. 1 and 2, Oxford University Press, New Delhi, 2000.

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(AJ6120)   IRRIGATION ENGINEERING AND HYDRAULIC STRUCTURES

B.Tech.III Year II-Semester - Civil

L / T / P / C
4 / 0 / 0 / 4

Objectives:
1. To know the Concept of reservoir planning and importance of reservoir sedimentation
2. To learn Gravity and earth dams and perform their stability analysis
3. To study various types of head works constructed at the head of the canal and types and different components and their purposes.
4. To understand Canal regulation structures and cross drainage structures featuring in the alignment of the channels.
5. To know Classification of canals and design of irrigation canals by Kennedys and Laceys theories

UNIT-I:
Introduction: Necessity and scope of irrigation: Types of irrigation, Methods of applying water to crops, Soil-waterplant relationship, Soil moisture, Field capacity, Permanent wilting point, Function of irrigation water, Duty, Delta, Irrigation frequency, Water requirements of crops, Estimation of consumptive use, Irrigation efficiencies, Benefits and ill effects of irrigation,Crop rotation.

UNIT-II:
Dams: Gravity dams: forces acting on gravity dam, causes of failure of a gravity dam, foundation for 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.

UNIT-III:
Canal Irrigation: Classification of canals, Canal alignment, Channel design based on Kennedy's theory & Lacy's regime theory, IS-code method, Tractive force theory, Channel cross-section in cutting and filling, Balancingdepth, Necessity of canal lining, Types of lining, Canal outlets, Causes, Effects and remedial measuresof water logging.

UNIT-IV:
Diversion Head Works: Components, layout of diversion head work, Weirs and barrages, Types of weirs, Bligh's creep theory,Lane's theory and Khosla's theory on design of weirs on permeable foundations, Divide wall, Fishladder, Under sluice, Silt ejectors and silt excluders, Upstream and downstream protection measures. Canal fall, Necessity, Location and types of falls, Cistern design, Design principles of slopping glacisfall. Head regulators and cross regulators, Design principles of head regulator and cross regulator.

UNIT-V:

Hydropower Engineering: Introduction – Source of energy, Power potential studies, Flow duration and Power duration curves, Load curves, Load factor, Utilization and capacity factor - Classification of hydropower plants, General layout and components, Penstock and water hammer effect. Power house general layout and its classifications based on location.

Text Books
1. R.S. Varshney, et al "Theory and Design of Irrigation of Structures – Vol.I & II, Nem Chend Bros, Roorkee.
2. S.K. Garg, "Irrigation Engineering and Hydraulic Structures", Khanna Publishers, New Delhi.

References:
1. Bharat Singh, Irrigation Engineering, Nem Chend Bros, Roorkee.
2. G.L. Asawa, "Irrigation Engineering", New Age Publications, New Delhi.
3. K.R. Arora, "Irrigation, Water Power and Water Resources Engineering", Standard Publications,New Delhi.
4. B.C. Punmia, "Irrigation and Water Power Engineering", Standard Publishers, New Delhi.

Outcomes:
On completion of this course, students will be able to
1. Understand importance of reservoir sedimentation in planning for water resources
2. Perform stability analysis for gravity and earth dams.
3. Analyze the parameters needed in the design of weirs/barrages in permeable soils.
4. Design the irrigation canals, canal regulation structures and cross drainage Structures.
5. Design canals using existing theories.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ6121)   STRUCTURAL ANALYSIS – II

B.Tech.III Year II-Semester-Civil   **L / T / P / C**
                                                                      4 / 1 / 0 / 4

Objectives:
This course will develop students' knowledge in/on
    1: Analysis of three and two hinged arches
    2: Cable and suspension bridges under different loads
    3: Analysis of indeterminate structures using flexibility matrix method
    4: Analysis of indeterminate structures using stiffness matrix method
    5: Analysis of Indeterminate trusses

UNIT – I
Three Hinged Arches: Principle of Arch action, Eddy's theorem, Circular and parabolic arches, Determination of horizontal thrust, Bending moment, Normal thrust and radial shear force. Influence line diagrams.
Two Hinged Arches: Principle involved in analysis of two hinged arches. Determination of horizontal thrust, Bending moment, Normal thrust and radial shear force. Influence line diagrams.

UNIT – II
Cables: Forces in cables subjected to point loads and uniformly distributed load. Cables with supports at same levels and different levels, Length of cable, different support conditions, Influence lines diagrams.
Suspension Bridges: Simple suspension bridges with two hinged and three hinged stiffening girders. Bending Moment and Shear Force diagrams, Influence line diagrams.

UNIT – III
Flexibility matrix method-Beams:
Introduction, determination of internal and external statically indeterminacy for different types of structures. Analysis of beams up to second degree of indeterminacy. Bending moment and shear force diagrams.
Flexibility matrix method-Frames: Rectangular portal frames upto 2nd degree of static indeterminacy. Bending moment and shear force diagrams. Analysis of statically indeterminate plane trusses-Up to second degree.

UNIT – IV
Stiffness matrix method -Beams: Introduction, determination of kinematic indeterminacy for different types of structures. Analysis of continuous beams up to second degree of kinematic indeterminacy, bending moment and shear force diagrams.
Stiffness matrix method -Frames: Rectangular portal frames up to second degree of kinematic indeterminacy. Bending moment and shear force diagrams. Analysis of statically indeterminate plane trusses-Up to second degree of kinematic indeterminacy.

UNIT – V
Kani's Method: Introduction, Application to portal frames, frames with Sway, Multi-storied frames, one bay-two storied structures, Symmetry principles.
Approximate Analysis of Multi Storied Frames:
Substitute frame method, portal method and cantilever method.

Text Books:
1. G.S. Pandit and S.P. Gupta "Structural Analysis a Matrix analysis of Structures", Tata McGraw-Hill, New Delhi. Latest Edition
2. C.S.Reddy "Basic Structural Analysis", Tata Mc Graw Hill Education Pvt Ltd., New Delhi.

Reference Books:
1. Vazrani and Ratwani, " Structural Analysis vol-1 and vol 2", Khanna Publishers.
2. S. Ramamrutham and R. Narayan "Theory of Structures", Dhanpat Rai.
3. Sujit Kumar Roy and Subrata Chakrabarty, "Fundamentals of structural analysis with computer analysis and applications", S.Chand and Company Ltd., New Delhi.

Outcomes:
After completion of this course, students will be able to….
1: Analyze three and two hinged arches
2: Analyze cables and suspension bridges under different loadings
3: Develop SFD and BMD for beams and frames using flexibility matrix method
4: Develop SFD and BMD for beams and frames using stiffness matrix method
5: Analyze Indeterminate Structures

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ6122) DESIGN OF STEEL STRUCTURES

B.Tech.III Year II-Semester-Civil   **L / T / P / C**
                                                                      4 / 1 / 0 / 4

Objectives:
This course will develop students' knowledge in/on
    1: Steel structures and philosophy of limit state design
    2: Bolted and welded connections
    3: Tension members and compression members
    4: Flexural members and column bases
    5: Girders

UNIT – I
Structural steel: Historical development, Advantages and disadvantages of structural steel, Types of structural steel, various design philosophies of structural steel, Specifications and codes, loading and load combinations.

Principles of Limit State Design: Limit state design philosophy, Load and material partial safety factors, Design criteria, ultimate limit states and serviceability limit states.

UNIT – II
Bolted Connections: General considerations, Riveted connections, Bolted connections, specifications for connected parts, Types of bolted joints, Lap and Butt connection, Assumptions made in analysis, Failure of bolted connections, Limit states, Efficiency of joints, Strength of plate connections.

Welded Connections: Introduction, Welding, principal types of welds, Types of welded joints, Specifications for fillet welded joints, Strength of fillet welds, Stresses due to individual forces, Combination of stresses, Design of joint.

UNIT – III
Tension Members: Types of tension members, Behavior of tension members, Net sectional area, Analysis of tension members, Sectional efficiency, Design of tension members, Splices in tension members.

Compression Members: Types of column sections, Behavior of compression member, Classification of cross sections, Slenderness for flexural bulking, Design considerations, Analysis and design of compression member, Design of built-up compression member.

Column Bases: Design of slab base, Design of gusseted base and grillage foundation.

UNIT – IV
Flexural Members: Types of sections for beams, Behavior of beams in flexure, Classification of beam cross sections, Stability of beams, Failure modes, Design criteria for beams, Design moment strength for supported beams, Design shear strength of beams, Effective span of beams, Design procedure of simple beams, Built up beam sections, Lateral torsional buckling, Effective length for lateral torsional buckling, Laterally unsupported beams.

UNIT – V
Girders: Design of welded plate girder: Design of main section, Design of end bearing stiffness

and intermediate stiffness

Text Books:
1. M L Gambhir,"Fundamentals of Structural steel design", Mc Graw Hill.
2. S K Duggal, "Limit state design of steel structures", Mc Graw Hill.
3. N. Subramanian, "Design of steel structures", Oxford Higher Education, 2nd edn.

Reference Books:
1. S. S. Bhavikatti, "Design of steel structures ", International Publishing House.
2. IS 800-2010, "Code of practice for General construction in steel", Bureau of Indian standards, New Delhi.
3. SP: 6(1-7)," Handbook for structural engineers", Bureau of Indian standards, New Delhi, 1980.
4. IS 808, "Dimensions for hot rolled steel beam, column, channel and angle sections", Bureau of Indian standards, New Delhi, 1989.

Outcomes:
After completion of this course, students will be able to….
  1: Appraise the importance of steel structures and limit state method of design
  2: Design different types of bolted and welded connections
  3: Classify and design various types of tension and compression members
  4: Design different flexural members and column bases
  5: Design Girders

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ6137) BRIDGE ENGINEERING
(Professional Elective – II)

B.Tech.III Year II-Semester - Civil

L / T / P / C
3 / 1 / 0 / 3

Objectives:
This course will develop students' knowledge in/on
> 1: Basics of bridges and design loads.
> 2: Analyze and design Deck Slab and T Beam Bridge
> 3: Plate girder and Truss bridge.
> 4: Design of bridge bearings, piers and abutments.
> 5: Bridge Inspection and Maintenance

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

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.

UNIT – II
T- Beam Bridges:
General features, Introduction to Pegeard's Method , Design of interior panel slab, Courbon's method of analysis of longitudinal and cross girders.

UNIT – III
Plate Girder Bridge: Components of plate Girder Bridge, Design of plate girder bridge for railway loading.

UNIT – IV
Steel Truss Bridge: Types of Trusses, General and design features, Design of steel truss bridge as per IRC loading.

Unit – V
Bridge Bearings: Types of bearing, forces on bearing, Design of elastomeric bearings, Types of expansion joints as per IRC:83-Part-I, and Part-II

Pier and Abutments: Types of piers and abutments, Forces acting, Stability analysis and design.

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. VK Raina " Concrete Bridge Design & Practise
4. Ram Chandra, Design of Steel Structures, Vol. II, Standard book house, New Delhi.
5. IRC 5, 6 and 7, "Code of Practice for Design of Bridges", Indian Road Congress, New Delhi.
6. IS: 800-1984: "Code of practice for steel construction", Bureau of Indian Standards, New Delhi.
7. IS: 456-2000: "Code of practice for Plain and Reinforced Concrete", Bureau of Indian Standards, New Delhi.

Outcomes :

After completion of this course, students will be able to….
1: Classify bridges and loads acting on them.
2: Design Deck slab and T-beam bridges.
3: Design Plate Girder Bridge and Steel Truss Bridge.
4: Design bridge bearings, piers and abutments.
5: Inspect the bridge and suggest the repair for Maintenance

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ6138) WATERSHED MANAGEMENT
(Professional Elective – II)

B.Tech.IIIYear –II Semester - Civil

L / T / P / C
3 / 1 / 0 / 3

Objectives:
1. To learn how to protect, conserve and improve the land of watershed for more efficient and sustained production & to protect and enhance the water resource originating in the watershed.
2. To know Soil erosion and to reduce the effect of sediment yield on the watershed & to rehabilitate the deteriorating lands.
3. To understand Moderate the floods peaks at downstream areas to increase infiltration of rainwater.
4. To study Increase the production of timbers, fodder and wild life resource & to enhance the ground water recharge, wherever applicable.
5. To learn types of cropping and dry land agriculture.

UNIT – I:
Introduction and basic concepts: Concept of watershed, Introduction to watershed management, objectives of watershed development, need for watershed development in India, Characteristics of Watershed, different stack holders and their relative importance, holders and their relative importance, Watershed management policies and decision making.

UNIT – II:
Watershed Modeling: Standard modeling approaches and classification, system concept for watershed modeling, overall description of different hydrologic processes, modeling of rainfall runoff process, subsurface flows and groundwater flow, Soil Erosion, Estimation of soil erosion.

UNIT – III:
Management of Water Quality: Water quality and pollution, types and sources of pollution, water quality modeling, environmental guidelines for water quality.
Water Harvesting: Rainwater harvesting catchment harvesting harvesting structures, soil moisture conservation, check darns, artificial recharge, farm ponds, and percolation tanks.

UNIT – IV:
Storm Water and Flood Management: Storm water management, design of Drainage system, flood routing through channels and reservoir, flood control and Reservoir operation, case studies of flood damage.
 Drought Management: Drought assessment and classification, drought analysis techniques, drought mitigation planning.

UNIT – V:

Integrated Watershed Management: Introduction to integrated approach, conjunctive use of water resources.

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.

Text Books:
1. Watershed Management by JVS Murthy, – New Age International Publishers
2. Water Resource Engineering by R. Awurb s and WP James, – Prentice

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. "Watershed management :Guidelines for Indian Conditions" By E.M. Tideman, Omega Scientific Publishers.
4. "Hydrology and Soil Conservation Engineering" By Ghanshyam Das, Prentice Hall India.
5. "Watershed Planning & Management" By - Dr. Rajvir Singh, Yash Pulishing House.
6. "Watersheds - Processes, Assessment and Management" By - Pau A. Debarry, John Wiley & Sons.

Outcomes:

On completion of this course, students will be able to
1. Protect or conserve the land for watershed.
2. Provide standard quality of water by encouraging vegetation and waste disposal facilities.
3. Check soil erosion and to reduce the effect of sediment yield on the watershed.
4. Enhance the ground water recharge, wherever applicable.
5. Know the different cropping and dry land agriculture.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS, Affiliated to JNTUH)

(AJ6139) REHABILITATION AND RETROFITTING OF STRUCTURES
(Professional Elective – II)

B.Tech. IIIYear–II Semester - Civil

L / T / P / C
3 / 1 / 0 / 3

Objectives:
This course will develop students' knowledge in/on
    1: Distress and damages of buildings.
    2: Types of NDT.
    3: Corrosion in Reinforcement.
    4: Repairs 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, Partially destructive Testing, Non- Destructive Testing (NDT) and Methods

UNIT – III
Corrosion of Steel Reinforcement, Causes, Mechanism and Prevention. Damage of Structure due to Fire, Fire rating Of Structures, Phenomena of Desiccation.

UNIT – IV
Repair of Structure ,Common types of Repair, Repair in Concrete Structure, 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.

References:
    1. Bungey, "Non-Destructive Evaluation of concrete Structures" Surrey University Press.
    2. W.H.Ranso, "Concrete Repairs and Maintenance Illustrated" RS Means Company.
    3. PC Varghese "

Outcomes:
After completion of this course, students will be able to….
    1:Understand about distress & damage of structures.
    2:Understand about practical and NDT .
    3:Understand about different techniques of repairs of Structures.

4: Able to know about Monitoring of Structures by Sensors.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ6015) ADVANCED ENGLISH COMMUNICATION SKILLS LAB

B.Tech. IIIYear–II Semester - Civil   **L / T / P / C**
                                                                       0 / 0 / 3 / 2

1. **Introduction:**
    The introduction of the English Language 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 an integrated theory and lab course to enable students to use 'good' English and perform the following:
    - Gather ideas and information, to organize ideas relevantly and coherently.
    - Engage in debates.
    - Participate in group discussions.
    - Face interviews.
    - Write project/research reports/technical reports.
    - Make oral presentations.
    - Write formal letters.
    - Transfer information from non-verbal to verbal texts and vice versa.
    - To take part in social and professional communication.

2. **Objectives:**
    This Lab focuses on using computer-aided multimedia 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.

3. **Syllabus**:
    The following course content is prescribed for the Advanced Communication Skills Lab:
    - Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
    - Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
    - Group Discussion – dynamics of group discussion , intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
    - Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
    - Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
    - Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.

➢ Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:
    The English Language Lab shall have two parts:
i)   **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
ii)   **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):
Computer network with Lan with minimum 60 multimedia systems with the following specifications:
    iii)   P – IV Processor
        a) Speed – 2.8 GHZ
        b) RAM – 512 MB Minimum
        c) Hard Disk – 80 GB
    iv)   Headphones of High quality

5. Suggested Software:
   The software consisting of the prescribed topics elaborated above should be procured and used
Suggested Software:
- **Clarity Pronunciation Power** – part II
- **Oxford Advanced Learner's Compass**, 7th 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**
  - ➢ **Team Building,**
  - ➢ **Decision making**
- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

6. Books Recommended:
1. **Effective Technical Communication**, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. **A Course in English communication** by Madhavi Apte, Prentice-Hall of India, 2007.
3. **Communication Skills** by Leena Sen, Prentice-Hall of India, 2005.
4. **Academic Writing- A Practical guide for students** by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
5. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
6. **Body Language- Your Success Mantra** by Dr. Shalini Verma, S. Chand, 2006.
7. **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice**, New Age International (P) Ltd., Publishers, New Delhi.
8. Books on **TOEFL/GRE/GMAT/CAT** by Barron's/cup
9. **IELTS series with CDs** by Cambridge University Press.

10. **Technical Report Writing Today** by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
11. **Basic Communication Skills for Technology** by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
12. **Communication Skills for Engineers** by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
13. **Objective English** by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
14. **Cambridge Preparation for the TOEFL** Test by Jolene Gear & Robert Gear, 4th Edition.
15. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

DISTRIBUTION AND WEIGHTAGE OF MARKS:

Advanced Communication Skills Lab Practicals:

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

2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 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 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.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS, Affiliated to JNTUH)

(AJ6123) SOIL MECHANICS LAB

B.Tech. III Year II-Semester-Civil

L / T / P / C
0 / 0 / 3 / 2

Objectives:
1. To know Classification of Indian soils.
2. To Determination of coefficient of permeability.
3. To Determination compaction characteristics.
4. To Determination of shear strength parameters

List of experiments:
1. Determination of Consistency Limits:
   (a) Liquid limit (b) Plastic limit
2. Classification of Coarse Grained Soil through Sieve Analysis.
3. Determination of Insitu Density by
   (a) Core cutter method (b) Sand replacement method
4. Determination of OMC and Maximum Dry Density by Compaction Method.
5. Determination of Coefficient of Permeability.
   a) Constant head method   b) Falling head method
6. Determination of Coefficient of Consolidation.
7. Determination of Unconsolidated Undrained Shear Strength Parameters Direct Shear test.
8. Determination of Unconsolidated Undrained Shear Strength Parameters Unconfined compression Test.
9. Demonstration of Tri- Axial Shear test.
10. Demonstration of California Bearing Ratio test
11. Demonstration of Vane Shear test

Laboratory Manual:
1. "Geotechnical Engineering Laboratory Manual", prepared by faculty of Department of Civil Engineering.

Text Books:
1. B. M. Das, "Soil Mechanics Laboratory Manual", Oxford University Press, 8th edn, 2012
2. SP 36 (Part – I): 1987-"Compendium of Indian Standards on Soil Engineering", Bureau of Indian Standards, New Delhi.

Outcomes:
On completion of this laboratory course, students will be able to
1. Classify the given soil.
2. Determine coefficient of permeability of different soils.
3. Determine optimum moisture content and maximum dry density for different soils.
4. Determine shear strength parameters.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS, Affiliated to JNTUH)

(AJ6124)   STRUCTURAL ENGINEERING DETAILING LAB

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

Objectives:
This laboratory course will develop students' knowledge in/on
      1: Detailing of Beams, Slab, Columns' and Footings
      2: Detailing of RCC Water Tank
      3: Detailing of steel braced column and grillage foundation.
      .

LIST OF EXPERIMENTS

Preparation of working drawings using AUTO CAD for the following structural elements as per SP-34, the elements are to be designed prior to preparation of drawings.

1   Detailing of R.C.C beams
      a) Simply Supported Beam.
      b) Continuous Beam.
      c) Cantilever Beam.
      d) T-Beam.
      e) L-Beam.
2   Detailing of R.C.C Slabs
      a) One Way and Two Way Slabs.
      b) Simply Supported Slab.
      c) Continuous Slab.
3   Detailing of Tied Columns and Spirally Reinforced Columns.
4   Detailing of Footings for R.C.C Columns.
      a) Combined Footings.
      b) Isolated Footings.
      c) Rectangular and Trapezoidal Footings.
5   Detailing of Beam Column steel joints.
6   Detailing of RCC Water tank/Retaining wall.
7   Detailing of steel braced column.
8   Detailing of grillage foundation.

Laboratory Manual:
1. "Civil Engineering Detailing Laboratory Manual", prepared by the faculty of Civil Engineering.

References:
1. "Hand book on Concrete Reinforcement and Detailing-SP 34-1987", Bureau of Indian Standards-New Delhi.
2. B.C Punmia, A.K.Jain. "R.C.C Designs", Laxmi publishers, New Delhi, 2013.
3. Arya and Ajmani ,"Design of steel structures " Nem Chand and Bros, Roorkee, U.P.

Outcomes:

After completion of this laboratory course, students will be able to

1: Prepare working drawings for Beams, Slabs, Columns, Footings
2: Prepare working drawings RCC Water Tank
3: Prepare working drawings steel braced column and grillage foundation

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJMC03)   ENERGY STUDIES

B.Tech.III Year II – Semester - Civil   **L / T / P / C**
2 / 1 / 0 / 0

Module 1:
Energy Sources – Fossil fuels. Nuclear fuels, hydel, solar, wind and bio fuels in India, Energy Conservation, Nuclear Energy through fission and fusion processes.

Module 2:
Energy Conversion – Energy conversion from source to utility, Solar, Nuclear, Geothermal, Tide and Wind Energies.

Module 3:
Global Energy Scenario-Role of Energy in economic development and social transformation, over all energy demand, availability and consumption, depletion of energy resources and its impact on economy, Non proliferation of Nuclear energy. International policies of G-8, G-20 OPEC and European union countries.

Module 4:
Indian Energy scenario – Commercial and Non commercial forms of energy, Utilization pattern in the past, present and also future prediction, Sector wise energy consumption.

Module 5:
Energy Policy: Energy policy issues at global level, national level and state level, Energy conservation Act 2001, Electricity act 2003, Energy pricing and its impact on global variations.

Text Books:
1. Jose Goldeberg. Thomas Johanson, and Reddy A.K.N., Energy for Sustainable World, Wiley Eastern, 2005.
2. Charles E. Brown, World Energy Resources, Springer Publication, New York, 2002.
3. Culp, A.W., Principles of Energy Conversion, McGraw Hill New York, 2004.

B.TECH

IV YEAR

I & II SEMESTER
SYLLABUS

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC-AUTONOMOUS, Affiliated to JNTUH)

(AJ7125)   ENVIRONMENTAL ENGINEERING

B.Tech.IV Year I-Semester   L / T / P / C
                                                                          4 / 1 / 0 / 4

Objectives:
1. To learn Quality and quantity aspects of water.
2. To understand Operations involved in water treatment and distribution.
3. To know Sewage analysis and hydraulic design of sewer.
4. To study various Methods of sewage treatment and their operations.
5. To learn secondary sewage treatment methods and onsite disposal methods.

UNIT – I:
Water Demand: Classification of sources of water supply, Choice of source, Types of water demand, Per Capita Demand, Factors affecting per-capita demand, Factors affecting water losses, Fluctuations in demand and its effects on different components of water supply scheme, Design period, Population forecasting methods, Fire demand.

Water Quality: Physical, chemical and biological characteristics of water quality, Water borne diseases and their control, Quality standards for municipal supplies.

UNIT – II:
Purification of Water: Purification of water – water treatment: Operations involved in water treatment, Screening, Plain sedimentation, Sedimentation aided with coagulation, Filtration, Disinfection, Softening, Aeration.

Distribution System: General requirements, Layouts of distribution networks, Methods of supply, Systems of supply, Distribution reservoirs – types, functions, Storage capacity of distribution reservoirs, Design of distribution networks, Analysis of complex pipe networks-Hardy Cross method, Appurtenances in distribution system.

UNIT – III:
Quality and Quantity Perspectives of Sewage: Physical, chemical and biological characteristics of sewage, Analysis of sewage, Biological Oxygen Demand and Dissolved Oxygen profile-processes and kinetics involved, Sewerage systems-merits and demerits, Estimation of dry weather flow, Estimation of storm water flow.

Sewer and sewer appurtenances: Hydraulic design of sewer, Hydraulic formulae for design of sewers, Minimum and maximum velocity of flow in sewers, Materials for sewers, Joints in sewers, Shapes of sewers, Sewer appurtenances.

UNIT – IV:
Sewage treatment: Layout and general outline of various units in a waste water treatment plant Process flow diagram, Primary treatment, Screens, Grit chamber, Skimming Tanks, Principles and design of biological treatment, trickling filters Sedimentation Tanks, Theory and Design, Activated sludge process.

UNIT – V:

Secondary treatment of sewage: Sewage filtration, Construction and design of Oxidation Ponds, Oxidation ponds, Aerated lagoons, Rotating biological contractors, Sludge digestion tank, Treatment and disposal of sludge, On-site disposal methods.

Text Books:
4. P.N.Modi, "Water supply Engineering- Environmental Engineering–I", Standard Book House., New Delhi.
5. P.N.Modi,"Sewage Treatment and Disposal – Environmental Engineering-II", Standard Book House., New Delhi.

References:
9. Howard S. Peavy, Donald R. Rower and George Tchobanoglous, "Environmental Engineering", Mc Graw-Hill International Edition.
10. The Expert Committee, CPHEEO "Manual on Water Supply and Treatment", Ministry of Urban Development, Govt. of India, New Delhi.
11. The Expert Committee, CPHEEO, "Manual on Sewerage and Sewage Treatment Systems", Ministry of Urban Development, Govt. of India, New Delhi.

Outcomes:
On completion of this course, students will be able to
1. Analyze problems related to analysis of water quality and quantity
2. Design various unit processes of water treatment and distribution
3. Explain various parameters of sewage and design the sewerage systems
4. Explain and design various units of sewage treatment

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC-AUTONOMOUS, Affiliated to JNTUH)

(AJ7126) HIGHWAY ENGINEERING

B.Tech.IV Year I-Semester   **L / T / P / C**
                                                                  4 / 1 / 0 / 4

Objectives:
1. To know Planning and different types of roads.
2. To study Geometric design of highways and valley curves
3. To understand Highway materials their desirable properties and suitability
4. To learn Design of flexible, rigid pavements and also the construction
5. To study Highway economics and financing of projects

UNIT – I:
Highway development and planning: Introduction, Highway development in India, Necessity for highway planning, Different road development plans; Classification of roads-Road network patterns-Highway alignment-Engineering surveys-Drawing and reports-highway project

UNIT – II:
Geometric design of highways: Factors controlling alignment, Engineering surveys, Cross section elements, Sight distance, Stopping sight distance, Overtaking sight distance, Intermediate sight distance, Design of horizontal alignment, Radius, Super elevation, Design speed, Widening of pavements, Transition curve, Design of vertical alignment, Grades, Grade compensation, Summit and valley curves.

UNIT – III:
Pavement materials: Soil – CBR, tests on aggregates and their desirable properties, Tests on bitumen materials and their desirable properties, Marshall method of mix design, MORTH specifications for semi dense bituminous macadam, Dense bituminous macadam and bituminous concrete.

Pavement design: Factors, design of flexible pavements, CBR method, IRC recommendations, design of rigid pavements, Westergaards stress equation for wheel loads, Warping stresses, Frictional stresses, Critical combination of stresses, IRC recommendations.

UNIT – IV:
Pavement construction: General features of highway construction, Construction specification as per MORTH for flexible and rigid pavements, Construction of joints in cement concrete pavements.

Maintenance and evaluation: Importance of highway maintenance, Failures in flexible and rigid pavements, Pavement maintenance, Periodic, Routine, Special repairs, Pavement evaluation, Strengthening of pavements, Overlay design.

UNIT – V:
Highway drainage: Introduction, Importance of highway drainage, Surface drainage, Sub surface drainage, Erosion control, Road construction in water logged areas.

Highway economics and finance: Introduction, Highway user benefits, Highway cost, Economic analysis and highway finance.

Text Books:
6. S.K. Khanna, C.E.G. Justo, A.Veeraraghavan,"*Highway Engineering*", Nem Chand and Bros.

Reference Books:
12. E.J. Yoder and Witezak, "*Principles of Pavement Design*", John Wiley and Sons, 2nd edn.,
13. L.R.Kadiyali, "*Principles of Highway Engineering*", Khanna Publishers.
14. Relevant IRC Codes IRC: 37, IRC: 38, IRC: 52, IRC: 58, IRC: 66, IRC: 73, IRC 81, IRC: 86 and MORTH.

Outcomes:
On completion of this course, students will be able to
1. Analyze the planning process required for highways and design the geometric features
2. Recommend suitable highway materials and design of flexible, rigid pavement
3. Design overlay, analyze the causes for failure of flexible and rigid pavement
4. Demonstrate highway drainage systems and assess feasibility of highway project

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS, Affiliated to JNTUH)

(AJ7140)   FOUNDATION ENGINEERING
(Professional Elective – III)

B.Tech.IV Year I-Semester

L / T / P / C
3 / 1 / 0 / 3

Objectives:
1. To learn Shallow and deep foundations
2. To know Bearing capacity of soils and foundation settlements
3. To understand the Expansive soils
4. To study Earth pressures on foundations and retaining structures
5. To know Machine Foundation

UNIT – I:
Site investigation and Types of foundation: Types of exploration, Types of samplers, SPT test, Static and dynamic cone penetration tests, Plate load test, Types of foundations, Different types of loads coming on foundations, Choice of foundations.

Shallow foundations: Bearing capacity- Definitions and theories-Terzaghi, Meyerhof, Skempton and Vesic, Terzaghi's bearing capacity equation, Effect of size, shape, Ground water table, depth of embedment and load inclination on bearing capacity, Field determination of bearing capacity, Settlement of foundations, Elastic settlements, Permissible settlements.

UNIT – II:
Deep Foundations: Pile Foundations-Classification of piles, Load bearing capacity of piles, Static formulae, Negative skin friction, Dynamic formulae, ENR and Hiley's formulae, Pile load tests, Group action of piles, Pile Groups in sand, gravel and clay, Settlement of pile groups.

UNIT – III:
Caissons: Types of well foundations, Construction of well foundation, Sinking of open wells, pneumatic caissons, Box caissons and rectification methods.

Foundations on expansive soils: Identification of expansive soils, Problems associated with expansive soils, Design considerations for foundations in expansive soils, under reamed piles.

UNIT – IV:
Slope stability analysis: Introduction, Infinite and Finite slopes, Types of slope failures, Different factors of safety, Stability analysis of finite slope by Swedish and Friction Circle methods, Taylor's stability number, Stability analysis of earthen dam for different conditions.

Earth Pressures: Introduction, Types of lateral earth pressure – Active, at rest and passive earth pressure, Rankine's and Coulomb's earth pressure theories, Culmann's Graphical solution.

UNIT – V:
Machine foundations: Types of machine foundations, Basic definitions, Degree of freedom of block foundation, Field methods of determining design parameters, Cyclic plate load test, block

vibration test, Design criteria and detailing for machine foundations, Vibration analysis of machine foundation**.**

Text Books:
1. K.R. Arora, "Soil Mechanics and Foundation Engineering", Standard Publishers, New Delhi.
2. Shashi K. Gulhati, Manoj Datta, "Geo Technical Engineering" , Mc Grawhill Publications, New Delhi.

References:
3. Srinivasulu and Vaidyanathan, "Handbook of Machine Foundations", Tata Mc Graw Hill Publications, New Delhi.
4. Shenbaga R Kaniraj, "Design Aids in Soil Mechanics and Foundation Engineering", Tata McGraw Hill Education Private Limited, New Delhi.

Outcomes:
On completion of this course, students will be able to
1. Analyze shallow and deep foundations
2. Calculate the bearing capacity of soils and foundation settlements
3. Identify the problems associated with expansive soils
4. Determine the earth pressures on foundations and retaining structures
5. Analyze Machine Foundation

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS, Affiliated to JNTUH)

(AJ7141)   ADVANCED ANALYSIS OF STRUCTURES
(Professional Elective – III)

B.Tech.IV Year I-Semester   **L / T / P / C**
                                                             3 / 1 / 0 / 3

Objectives:
1. To study Analysis of indeterminate structures using flexibility matrix method
2. To learn Analysis of indeterminate structures using stiffness matrix method
3. To know the different elements which are used in FEM.
4. To understand one dimensional and two dimensional Problems in FEM.

UNIT – I:
Indeterminate Trusses: Determination of Static and kinematic indeterminacies, Analysis of trusses having single and two degrees of internal and external indeterminacies-Castiglione's second theorem.

UNIT – II:
Flexibility matrix method-Beams:
Introduction, determination of internal and external statical indeterminacy for different types of structures. Analysis of beams upto second degree of indeterminacy. Bending moment and shear force diagrams.

Flexibility matrix method-Frames: Rectangular portal frames upto 2nd degree of static indeterminacy. Bending moment and shear force diagrams. Analysis of statically indeterminate plane trusses-Up to second degree.

UNIT – III:
Stiffness matrix method -Beams: Introduction, determination of kinematic indeterminacy for different types of structures. Analysis of continuous beams up to second degree of kinematic indeterminacy, bending moment and shear force diagrams.

Stiffness matrix method -Frames: Rectangular portal frames up to second degree of kinematic indeterminacy. Bending moment and shear force diagrams. Analysis of statically indeterminate plane trusses-Up to second degree of kinematic indeterminacy.

UNIT – IV:
Introduction To Finite Element Method: Introduction to Finite Element Method – Basic Equations in Elasticity – Stress strain equations – concept of plane stress – plane strain – advantages and disadvantages of FEM.

One Dimensional Analysis: Finite Element Analysis (FEA) of – one dimensional problems – Bar element – Shape function stiffness matrix

UNIT – V:
Two Dimensional Analysis: FEA Two dimensional problem – CST – LST element – shape function – stress strain relation

Other Elements: Lagrangian – Serendipity elements – Hermite polynomials – regular, irregular 2 D & 3 D element – shape functions.

Text Books:
7. G.S. Pandit and S.P. Gupta "Structural Analysis a Matrix analysis of Structures", Tata McGraw-Hill, New Delhi. Latest Edition
8. Chandrupatla, T.R., and Belegundu, A.D., "Introduction to Finite Element in Engineering", Third Edition, Prentice Hall, India.

References:
15. Vazrani and Ratwani, " Structural Analysis vol-1 and vol 2", Khanna Publishers.
16. S. Ramamrutham and R. Narayan "Theory of Structures", Dhanpat Rai.
17. David V. Hutton,"Fundamentals of Finite Element Analysis", Tata McGraw Hill.
18. Reddy J.N., "An Introduction to Finite Element Method", McGraw-Hill, Intl. Student Edition.

Outcomes:
On completion of this course, students will be able to
1. Develop SFD and BMD for beams and frames using flexibility matrix method.
2. Develop SFD and BMD for beams and frames using stiffness matrix method.
3. Application of Elements and their importance.
4. Solve the one and two dimensional problems.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC- AUTONOMOUS, Affiliated to JNTUH)

(AJ7142) ELEMENTS OF EARTH QUAKE ENGINEERING
(Professional Elective – III)

B.Tech.IV Year I-Semester-Civil   **L / T / P / C**
3 / 1 / 0 / 3

Objectives:
This course will develop students' knowledge in/on
   1: Basic of theory of vibration related to dynamic motion.
   2: Single and multi degree of freedom system.
   3: Vibration analysis and various cases of continuous systems.
   4: Basics of earthquake engineering.

UNIT – I
Engineering Seismology: Earthquake phenomenon causes of earthquakes, Faults ,Plate tectonics, Seismic waves-terms associated with earthquakes, magnitude/Intensity of an earthquake, scale, energy released –earthquake measuring instruments-seismoscopy, Seismograph, accelerograph-strong ground motions, seismic zones of India.

UNIT – II
Fundamentals of Structural Dynamics: Objectives of dynamic analysis, Types of prescribed loading, Methods of discretization, Formulation of equations of motion by different methods, Direct equilibration using Newton's law of motion / D'Alembert's principle, Principle of virtual work and Hamilton principle.

Theory of Vibrations: Introduction, Elements of vibratory system, Degrees of Freedom, Oscillatory motion, Simple Harmonic motion, Vectorial representation of simple harmonic motion, Free vibrations of single degree of freedom system, Undamped and damped vibrations, Critical damping, Logarithmic decrement, Forced vibration of single degree of freedom systems, Harmonic excitation, Dynamic magnification factor.

UNIT – III
Single Degree of Freedom Systems: Formulation and solution of the equation of motion, Free vibration response, Response to Harmonic, Periodic, Impulsive and general dynamic loadings, Duhamel integral.

Multi Degree of Freedom Systems: Selection of the degrees of Freedom, Evaluation of structural property matrices, Formulation of the MDOF equations of motion, Undamped free vibrations, Solutions of Eigen value problem for natural frequencies and mode shapes, Analysis of Dynamic response, Normal co-ordinates, Uncoupled equations of motion, Orthogonal properties of normal modes.

UNIT – IV
Vibration Analysis: Introduction, Stodola method, Fundamental mode analysis, Analysis of second and higher modes, Holzer method, Basic procedure.

Continuous Systems: Introduction, Flexural vibrations of beams, Elementary case, Derivation of governing differential equation of motion, Analysis of Undamped free vibrations of beams in flexure, Natural frequencies and mode shapes of simple beams with different end conditions.

UNIT – V
Basics of Earthquake Analysis: Introduction, Excitation by rigid base translation, lumped mass approach, SDOF and MDOF systems.

Application of I.S. Code method: I. S. Code methods of analysis, introduction to seismic coefficient method and response spectrum method.

Text Books:
   9.   Mario Paz, *"Structural Dynamics"* C.B.S Publishers, New Delhi.

Reference Books:
   4.   Clough & Penzien, "Dynamics of Structures", McGraw Hill.
   5.   Anil K. Chopra, *"Dynamics of Structures",* Pearson Education (Singapore), Delhi.
   6.   I.S: 1893 - 1984, *"Code of practice for Earthquake resistant design of Structures"* and latest I.S: 1893 - 2002 (version) Part-1.

Outcomes:
 After completion of this course, students will be able to….
   1: Apply the theory of vibrations to structural dynamics.
   2: Evaluate the Response for Single and multi degree of freedom system.
   3: Apply the vibration analysis for beams.
   4: Describe various methods of earthquake analysis using IS Code.

(AJ7143) ESTIMATION AND VALUATION
(Professional Elective – IV)

B.Tech.IV Year I-Semester-Civil   L / T / P / C
                                                                        3 / 1 / 0 / 3

Objectives:
This course will develop students' knowledge in/on
1: Measurements and Estimation of various elements in Civil Engineering works.
2: Detailed Estimate for a given building and preparing a tender document.
3: Writing specifications, performing rate analysis and preparing valuation report for a residential building.
4: Types of contract and estimating Civil Engineering works.

UNIT-I
Elements of Quantity Surveying: Scope of Civil Engineering works- Standard terminology used in quantity Surveying- Standard method of measurement.

Measurements: General, Units of measurements, Requirements of estimation, Advantages, Estimation of Isolated and Step foundations. Importance and maintenance of M-Book, Measurement of earth work, Brick Masonry work, Concrete Work, Prestressed concrete work, steel Work-Timber works.

UNIT-II
Estimate of Buildings: Different types of estimates- Methods of estimation: Centre line method and individual wall method-Calculation of quantities of brick work, RCC, PCC, Plastering, White washing and Painting, Estimate of wood works for doors and frames. Preparation of detailed and abstract estimate for framed structures –RCC work, steel work including bar bending schedule.

UNIT-III
Specification and Rate analysis: Objective of specifications, General and detailed specifications for various items of work – Earth work excavation, Lime mortar, Cement concrete, damp proof course, Form work, Brick and stone masonry, Flooring, Painting and wood work. Purpose and requirements of schedule of rates, Procedure of rate analysis. Obtaining rate for different works namely cement works, DPC, Stone masonry, Brick masonry, Plastering, Flooring, and Painting.

UNIT-IV
Road Estimating: Estimate of Earthwork For Roads.

Valuation: Objective of valuation - Definition of various terms such as market value, Book value, Assessed value, Mortgage value, Replacement value, Capital cost, Cost escalation, Sinking fund and Depreciation methods. Fixation of rent, Preparation of valuation report for residential building.

UNIT-V
Tenders: Types of tender, Tender notice, Earnest money, Security deposit, Liquidated Damages, Arbitration, Escalation. Costing and preparation of tender document.

Contracts: General requirements of contract, Types of contract, Conditions, Termination of contract. Departmental procedures for execution of works.

Text Books:
1. B. N. Dutta, "Estimating and Costing in Civil Engineering", UBS Publishers, New Delhi.
2. M. Chakraborty, "Estimating, Costing, Specification and Valuation in Civil Engineering".

Reference Books:
1. D.D Kohli and R.C Kohli, "A Text Book of Estimating and Costing (Civil)",
   S. Chand and Company Ltd.

Outcomes :
After completion of this course, students will be able to….
1: Discuss types of measurements pertaining Civil Engineering works.
2: Prepare detailed estimate and tender document for building.
3: Perform rate analysis as per Schedule of Rates(SOR) and prepare valuation report for a Residential building.
4: Prepare detailed contract document and estimate for different types of Civil Engineering works.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ7144) THEORY OF ELASTICITY & PLASTICITY
(Professional Elective – IV)

B.Tech IV Year I-Semester-Civil

L / T / P / C
3 / 1 / 0 / 3

Objectives:
This course will develop students' knowledge in/on
1: Impart knowledge of Principle stresses and strains
2: Analytical skills of solving problems using plain stress and plain strain
3: Impart of engineering application of plasticity
4: Provide the student knowledge of fundamentals of theory of Plasticity

UNIT – I
Introduction: State of stress at a point in three-dimensional elasticity, Principal stresses, Octahedral stresses, Strain at a point, Equilibrium and compatibility conditions, Generalized Hooke's law.

UNIT – II
Plane Cartesian Elasticity: Plane stress, plane strain, Equations of equilibrium in two dimensions, Compatibility of strain, Boundary conditions, governing differential equation in Cartesian coordinates, Airy's stress function, Two-dimensional problems in rectangular co-ordinates, Method of solution by polynomials.

UNIT – III
Plane Problems in Polar Co - ordinates: Solution of two dimensional problem in polar coordinates, Stress distribution in radially symmetric problems, Effect of circular holes, concentrated force acting on a beam, Stress on a circular disc.

UNIT – IV
Torsion of Non - circular shafts: Saint Venant's method, stress Function Method of solution, Boundary conditions for torsion, problems - Membrane Analogy.

UNIT – V
Theory of Plasticity: Yielding and various yield criteria, yield surface, Heigh Westergard stress space subsequent yield surface, loading and unloading, Plastic stress, strain relations , Prandit's Equations, Relation based on Tresca criteria.

Text Books:
3. Dr. Sadhu Singh, Theory of Plasticity, Khanna Publishers, New Delhi.
4. Kamal kumar and R.C. Ghai, Advanced Mechanics of Materials.
5. "Theory of Plasticity by J.Chakarbarthy, McGrawhill Publications.
6. Theory of Elasticity by Y.C.Fung

Reference Books:
7. Timoshenko & Goodier, Theory of Elasticity, McGraw Hill Book Co. Ltd.
8. Theory of Elasticity by Gurucharan Singh

Outcomes:
 After completion of this course, students will be able to….
1: Execute the stress state and stresses analysis Topic of Work: The stresses
   State analysis
2: Use the numerical methods for the problem of the theory of elasticity in
   Practice
3: Use theory for solution of practice problem of stress and strain analysis
   Final examination
4: Impart the knowledge on Plasticity.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ7145) TRAFFIC ENGINEERING AND TRANSPORTATION PLANNING
(Professional Elective – IV)

B.Tech.IV Year I-Semester

L / T / P / C
3 / 1 / 0 / 3

Objectives:
1. To learn about Elements, characteristics and measures of traffic flow system
2. To know Various types of traffic studies and surveys, causes and preventive measures for traffic accidents
3. To study Concepts of traffic signaling, rotaries and interchanges in highways
4. To understand Traffic control devices, transportation planning and warrants for sign provision

UNIT – I:
Traffic Characteristics: Road user characteristics, Perception reaction, Driver strategy. Characteristics of vehicle, Kinematics and dynamics of vehicle.

Traffic Flow and Capacity: Nature of traffic flow, Relation between speed, Flow and density. Traffic capacity, Level of service (LOS), Basic definitions, Factors affecting capacity and LOS, Capacity of urban/rural highway with or without access control.

UNIT –II:
Traffic Studies and Surveys: Traffic volume studies, Methods and presentation of data. Origination-destination surveys, Methods and uses. Speed studies, Methods and presentation of data. Time and delay studies, Methods, Merits and demerits.

Accident Investigations: Traffic accident terminology, Accident studies- causative factors of road accidents, Accident analysis, Accident prevention.

UNIT– III:
Traffic Signals: Purpose of traffic signalling, Signal warrants. Signal design, Webster's method and IRC method. Signal coordination, Terminology, Principles of coordinated operations.

Rotary and Interchanges: Channelization, Design of intersection, Capacity of rotary, Interchanges at grade and grade separated.

UNIT – IV:
Traffic Operations and Control Devices: Traffic regulations, one way streets, Conflict points, Traffic signs, Traffic markings selection and design of flyover and bridges.

UNIT – V:
Transportation Planning: Introduction**,** Objectives and policies, Urban transport planning process, Travel demand forecasting, Trip generation, Trip distribution and traffic assignment, Advanced method of transportation planning.

Text books:
1. S.K Khanna, CEG Justo, A. Veeraraghavan, "Highway Engineering", Nem Chand and Bros.
2. L. R. Kadiyali, "Traffic Engineering and Transportation Planning" Khanna Publishers, 7th edn.

References:
1. Relevant IRC Codes IRC-53, IRC-65, IRC-64, IRC-67, IRC-66.
2. Fred Mannering and Walter Kilareski., "Principles of Highways Engineering and Traffic Analysis" - John Wiley and Sons Publication.
3. "Highway Capacity Manual", 2000.

Outcomes:
On completion of the course, the student will be able to
1. Explain the elements of traffic engineering, their characteristics and effects on traffic system.
2. Discuss the Different traffic studies and surveys, causes and preventive measures for traffic accidents.
3. Determine the signal time and state the different types of rotaries and interchanges.
4. Explain the different traffic control devices and stages of transportation planning.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ7127) ENVIRONMENTAL ENGINEERING LAB

B.Tech. IV Year I-Semester   L / T / P / C
                                                              0   / 0 / 3 / 2

Objectives:
1. To study Physical analysis of water sample
2. To study Chemical analysis of water sample
3. To Determine the dissolved oxygen in water sample

List of Experiments:
1. Determination of Acidity
2. Determination Alkalinity of water sample
3. Determination pH and Turbidity of water sample
4. Determination of Total Solids, Total dissolved solids, Suspended solids and Conductivity of water sample
5. Determination of Hardness of water sample
6. Determination of Chlorides
7. Determination of Optimum Coagulant dosage of water sample using Jar test
8. Determination of Chlorine demand
9. Determination of Chloride content of water sample
10. Determination of Dissolved Oxygen of water sample
11. Determination of Biological Oxygen Demand of water sample
12. Determination of Chemical Oxygen Demand of water sample

Laboratory Manual:
1. "Environmental Engineering Laboratory Manual", prepared by the faculty of Civil Engineering.

References:
1. B. Kotaiah and Dr. N. Kumara Swamy, "Environmental Engineering Laboratory Manual", Charotar Publishing House Pvt. Ltd.
2. P.N.Modi, "Water supply Engineering- Environmental Engineering –I", Standard Book House., New Delhi.
3. P.N.Modi,"Sewage Treatment & Disposal – Environmental Engineering-II", Standard Book House, New Delhi.

Outcomes:
On completion of this laboratory course, students will be able to
1. Characterize the quality of water for suspended matter by physical tests.
2. Evaluate the quality of water for hardness, chlorides using chemical analysis.
3. Measure Dissolved Oxygen concentration to assess the quality of water.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(UGC- AUTONOMOUS, Affiliated to JNTUH)

(AJ7128) HIGHWAY ENGINEERING LABORATORY

B.Tech. IV Year I-Semester-Civil

L / T / P / C
0 / 0 / 3 / 2

Objectives:

This laboratory course will develop students' knowledge in/on

1: Highway material testing

2: Desirable properties of pavement materials and their applications

3: To select the suitable material and recommend the tested material for pavement construction

LIST OF EXPERIMENTS

Road Aggregates Testing:

1   Aggregate crushing test
2   Aggregate abrasion test
3   Aggregate specific gravity
4   Aggregate impact test
5   Aggregate shape test
6   Aggregate attrition test

Bitumen Testing

7   Ductility test for bitumen
8   Softening point test for bitumen
9   Penetration test for bitumen
10   Flash and fire point test for bitumen

Laboratory Manual:

1. "Highway Engineering Laboratory Manual", prepared by faculty of Department of Civil Engineering.

Text books:

1. S.K. Khanna, C.E.G. Justo and A. Veeraraghavan, "Highway material testing", Nem Chand and Bros publications.

Outcomes:

After completion of this laboratory course, students will be able to…

1: Conduct various tests on pavement materials.

2: Interpret the results obtained from testing.

3: Recommend the tested material for pavement construction.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ8146)   GROUND IMPROVEMENT TECHNIQUES
(Professional Elective – V)

B.Tech.IV Year II-Semester
L / T / P / C
3 / 1 / 0 / 3

Objectives:
1. To Identify basic deficiencies of various soil deposits
2. To understand position to decide various ways and means of improving the soil
3. To learn the implementing techniques of improvement in Soil
4. To study Compaction using Piles and Soil Stability

UNIT — I:
Introduction to Ground Modification: Need and objectives, Identification of soil types, Selection of suitable ground improvement techniques based on soil condition In situ and laboratory tests to characterize problematic soils .Geotechnical problems in alluvial, laterite and black cotton soils - - methods of ground improvement and their applications

UNIT — II
Mechanical Modification: Deep Compaction Techniques- Blasting Vibro compaction, Dynamic Tamping and Compaction piles.

UNIT — III:
Hydraulic Modification: Objectives and techniques, traditional dewatering methods and their choice, Design of dewatering system, Electro-osmosis, Electro-kinetic dewatering. Filtration, Drainage and Seepage control with Geosynthetics, Preloading and vertical drains, Seepage analysis for two dimensional flow-fully and partially penetrating slots in homogenous deposits (Simple cases only).

UNIT — IV:
Physical and Chemical Modification: Modification by admixtures, Shotcreting and Guniting Technology. Types of grouts - Grouting equipment and machinery - Injection methods - Grout monitoring – Stabilisation with cement, lime and chemicals - Stabilisation of expansive soils. 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, - Applications of reinforced earth – reinforcement with strip, and grid reinforced soil. In-situ ground reinforcement, ground anchors, rock bolting and soil nailing. Concept of reinforcement - Types of reinforcement material use of Geotextiles for filtration, drainage and separation in road and other works.

Text Books:
1. Koerner R.M., "Construction and Geotechnical Methods in Foundation Engineering", McGraw-Hill.
2. Purushothama Raj, P. "Ground Improvement Techniques", Tata McGraw-Hill Publishing Company, New Delhi.

References:

1. Koerner, R. M., Designing with Geosynthetics — Prentice Hall, New Jersey.
2. Jones C. J. F. P. — Earth Reinforcement and soil structures — Butterworths, London.
3. Xianthakos, Abreimson and Bruce – Ground Control and Improvement .
4. Hall, Glassgow.Jones J.E.P., Earth Reinforcement and Soil Structure, Butterworths.

Outcomes:

On completion of this course, students will be able to
1. Perform the deep compaction techniques.
2. Know the modification of admixtures.
3. Know the modification by soil reinforcement.
4. Know compaction of piles and soil stability.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ8147) RAILWAY AND AIRPORT ENGINEERING
(Professional Elective – V)

B.Tech IV Year II-Semester   L / T / P / C
                                                                        3 / 1 / 0 / 3

Objectives:
1. To learn Structure and organization of railways, development of railways and its requirements.
2. To study Railway track components as per requirements and also geometric design of railway line
3. To Identify and interpreting the process related to airport planning and also related surveys.
4. To understand Zoning laws, approach zone and runway length & factors controlling taxiways and design of airfield pavement.

UNIT – I:
History of Indian railways: Developments in Indian railways, Organization, Railway finance, Classification of railway lines, Undertakings under ministry of railways.

Railway gauge: Gauges, types, choice of gauge, Problems caused by change of gauge, Importance of good alignment, Basic requirements of an ideal alignment, Traffic, reconnaissance, Preliminary and final location surveys.

UNIT – II:
Tracks, Rails and Sleepers: Requirement of good track, maintenance, Forces acting on track, coning of wheels, Functions of rails and types of rail, Rail wear, Rail failure detection, Functions and requirements of sleepers, Sleeper density, Types of sleepers.

Ballast, Sub-grade and Creep of Rails: Types and functions of ballast, Requirements of good ballast, Design of ballast section, Specification, tests on ballast, Slopes, execution of earth work in embankment and cutting, Failure of railway embankment, Theories for development of creep, Causes, effects of creep, Measurement of creep, Adjustments of creep.

UNIT – III:
Geometric Design: Details of geometric design, Gradients, grade compensation, Circular curves, Super elevation, safe speed, Transition curves, widening of curves, Vertical curves, Check rails.
Points, Crossing, Level Crossing: Important terms, switches, Tongue rails, Crossing, Turnouts, Layout of turnout, Classification of level crossing, Dimensions.

UNIT – IV:
Air transportation: Structure and organization of air transport, Directorate of civil aviation, National & International airports authority, Airports Authority of India, International Civil Aviation Organization.

Airport characteristics and airport planning: Relation between aircrafts and airports, Requirements of aircraft types, Field length regulations, Weight components, Aero plane

component parts, Classification of flying activity, Relation of aircraft to landing facility, Airport master plan, Regional planning, Site selection, Surveys.

UNIT – V:
Runway design: Zoning laws, Classification of obstructions and approach zone, Runway orientation, Basic runway length, Correction for elevation, Temperature and gradient, Runway geometric design.

Airport layout: Airport, Runway, gate and taxiway capacities, Airport and Runway configuration, Intersection design, Terminal and building area, Parking, Apron, Hanger

Taxiway design: Factors controlling taxiway layout, Geometric design standards for taxiway, Exit taxiways.

Text Books:
10. Satish Chandra and M.M. Agarwal , "Railway Engineering", Oxford Publishers.
11. S.C.Saxena and S.P.Arora, "A Text Book of Railway Engineering", Dhanpat Rai and Sons, Delhi.
12. S.K Khanna, M.G. Arora and S.S. Jain, "Airport Planning and Design", Nem Chand and Bros.
References:
19. J.S. Mundrey, "Railway Track Engineering", Tata McGraw Hill.
20. Rangwala., "Railway Engineering " Charotar Publishers.
21. Norman Ashford, Paul H. Wright., "Airport Engineering", Wiley Publicaations.
22. Rangwala, "Airport Engineering", Charotar Publishers.
23. Subhash C.Saxena, "Airport Engineering and planning" CBS Publications.

Outcomes:
On completion of this course, students will be able to
1. Explain the importance of railways and requirements of alignment.
2. Design the elements of railway track.
3. Analyze the planning process for airports.
4. Compute runway length, airport layout & design air field pavements.

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(AJ8148) FINITE ELEMENT METHOD
(Professional Elective – V)

B.Tech IV Year II-Semester   L / T / P / C
                                                              3 / 1 / 0 / 3

Objectives:
1. To know the basics of Finite Element theory and its advantages.
2. To learn different elements which are used in FEM.
3. To study one dimensional and two dimensional Problems in FEM.
4. To understand the static and Dynamic applications of FEM

UNIT – I:
Introduction to Finite Element Method: Introduction to Finite Element Method – Basic Equations in Elasticity – Stress strain equations – concept of plane stress – plane strain – advantages and disadvantages of FEM

Element Properties: Element shapes – nodes-nodal degree of freedom – strain displacement relation.

UNIT – II:
One Dimensional Analysis: Finite Element Analysis (FEA) of – one dimensional problems – Bar element – Shape function stiffness matrix

Beam Element: FEA Beam elements – stress strain relation – shape functions – stiffness matrix – continuous beams

UNIT – III:
Two Dimensional Analysis: FEA Two dimensional problem – CST – LST element – shape function – stress strain relation

Other Elements: Lagrangian – Serendipity elements – Hermite polynomials – regular, irregular 2 D & 3 D element – shape functions.

UNIT – IV:
Isoparametric formulation – Concepts of isoparametric elements for 2D analysis – formulation of CST element, 4-noded and 8-noded iso-parametric quadrilateral elements.

UNIT – V:
Applications: Plate Bending Problems - Finite Elements for Elastic Stability - Finite Elements in Fluid Mechanics- Dynamic Analysis

Text Books:
1. David V. Hutton,"Fundamentals of Finite Element Analysis", Tata McGraw Hill.
2. Chandrupatla, T.R., and Belegundu, A.D., "Introduction to Finite Element in Engineering", Third Edition, Prentice Hall, India.

References:
1. Reddy J.N., "An Introduction to Finite Element Method", McGraw-Hill, Intl. Student Edition.
2. Krishnamoorthy C. S. ,"Finite Element Analysis Theory and Programming", Tata McGraw Hill Education.
3. Zienkiewics, "The finite element method, Basic formulation and linear problems", Vol.1, 4th Edition, McGraw-Hill, Book Co.
4. Rao S.S, "The Finite Element Method in Engineering", Pergaman Press.
5. Cook R. D.,"Concepts and Applications of Finite Element Analysis", Wiley and Sons.

Outcomes:

On completion of this course, students will be able to
1. Develop computer programming codes for different applications.
2. Know the applications of elements and their importance.
3. Solve one and two dimensional problems.
4. Do static and dynamic analysis using FEM.

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(AJ8149) CONSTRUCTION PLANNING & PROJECT MANAGEMENT
(Professional Elective – VI)

Class: B.Tech.IV Year II-Semester
L / T / P / C
3 / 1 / 0 / 3

Objectives:
1. To know the Concepts of construction planning and project management
2. To learn project scheduling like PERT & CPM
3. To study Objectives of construction management
4. To understand Management information & control systems

UNIT – I:
Introduction: Historical background, planning for construction projects, steps involved in Planning objectives and principles of planning, Advantages, limitations and stages of planning, Bar charts and its limitations, Milestone charts, Work break down, Events and activities.

UNIT – II:
Networks: Rules for networks, Numbering the events, PERT and CPM, Project duration, Calculation of floats, Time estimates, Calculation of slacks and probable completion time.
Applications in Construction Engineering: Cost Analysis and control: Direct cost, Indirect cost, Optimization of cost, Exercises in civil engineering projects, Cost control in construction project, Resource analysis- smoothening and leveling in various construction projects.

UNIT – III:
Construction management: Introduction, Significance of construction management, Objectives and functions of construction management, Resources for construction industry, Construction team Major problems in construction industry, Functions and responsibilities of construction manager, Case studies, Future of construction management.

UNIT – IV:
Pre- Tendering and procurement: Pre-tending process and stages, Pre-Qualification of bidders, Overview of Procurement Management, Basic Steps in Procurement Process, Public Procurement in India, E-Procurement, , Indian Contract Act 1872, Definition of Contract and its applicability.**Construction contracts:** Understanding project contracts, Types of construction contracts, Standard conditions in construction contracts, Contractual documents, Conditions and specifications of contract.

Contracts Performance Management: Control and flexibility in contracts, Monitoring and controlling, Technical and operational performance of contracts, Controlling risks, Incentives and penalties, Change order management. **Contract Conditions:** Important contract clauses, Terms of payments, Retention, Acceptance and final payment, Time of completion, Extension of time, Maintenance period, Termination of contract and condition for termination.

UNIT – V:
Management information and control systems: Management Information and Control Systems, Communication, System Concepts, Need for Management Information, Design of Management Information Systems, Computer Processing, Value of Information, Management Information Systems in Construction Industry.
Decision making in construction industry: Benefit cost analysis, replacement analysis, Break even analysis, Risk management in construction industry.

Text Books:

13. Moder, J.J., Phillips, C.R., and Davis, E.W., Project Management with CPM and PERT and precedence diagramming, C.B.S. Publishers & Distributors, New Delhi.
14. Gajaria G.T., "Laws Relating to Building and Engineering Contracts in India", M. M. Tripathi Private Ltd.,Bombay, 1982 Tamilnadu PWD Code, 1986
15. Brien. J.J., CPM in Construction Management, McGraw Hill Book Company Inc., NY.

References:

9. S.Seetharaman, Construction Engineering and Management, Umesh publication, New Delhi.
10. Construction planning and Management, U.K.Srivastava, Galgotia Publications Pvt Ltd
11. V. K. Raina., "Construction and Contract Management" Shroff Publishers
12. B. S Ramaswamy, "Contracts and their Management", LexisNexis India, 2008.

Outcomes:

On completion of this course, students will be able to

1. Explain the importance of Construction planning
2. Do Project planning and its implementation
3. Explain the pre-tendering stages and standard forms of contract& appraise the performance of contract and contract administration
4. Understand construction project control processes and Management Information System

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
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(AJ8150) INDUSTRIAL WASTE WATER TEARTMENT
(Professional Elective – VI)

B.Tech.IV Year –II Semester   **L / T / P / C**
                                                           3 / 1 / 0 / 3

Objectives:
1. To learn Pollution and its Effects.
2. To know different types of industrial wastes.
3. To study Treatment plants.
4. To understand 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:
16. Industrial Waste Water pollution Control by W.wesley Eckenfelder-McGraw Hill
17. Industrial Treatment by Rao & Datta.

References:
7. Water Supply and Waste Water Engineering by D. Lal & A. K. Upadhyay- S. K .Kataria & Sons.

Outcomes:
On completion of this course, students will be able to
1. Know the methods to minimize the Pollution.
2. Do the operating of Treatment Plant.
3. Reduce volume of waste water.
4. Know about Maintenance of Treatment plant.

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(AJ8151) ADVANCED REINFORCED CONCRETE STRUCTURES
(Professional Elective – VI)

B.Tech. IV Year II-Semester   **L / T / P / C**
                                                               3 / 1 / 0 / 3

Objectives:
1. To learn Design of Flat slab and grid slab.
2. To know Behavior of retaining walls.
3. To understand the behavior of water retaining structures.
4. To study 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:
18. B.C. Punmia, "Reinforced Concrete Structures, Vol. I, II, III & IV", Laxmi Publishing Company.
19. Krishna Raju, "Advanced Reinforced Concrete Structures,Tata McGrawHill Book Education Pvt Ltd.

Referencs:
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:
On completion of this course, students will be able to
1. Design and detailing of Flat slab and grid slab.
2. Design and detailing of different types of earth retaining walls.
3. Design and detailing of various water retaining structures.
4. Design and detailing of different types of foundations, Bunkers and Silos.

OPEN ELECTIVES

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES
(UGC - AUTONOMOUS, Affiliated to JNTUH)

(AJ5129)   DISASTER MANAGEMENT AND MITIGATION
(Open Elective)

B.Tech.III Year I-Semester

L / T / P / C
3 / 0 / 0 / 3

Objectives:
1. To understand the disaster phenomenon, its different contextual aspects, impacts and public health consequences.
2. To learn the International Strategy for Disaster Reduction and to increase skills and abilities for implementing the Disaster Risk Reduction (DRR) Strategy.
3. To know the skills and abilities to analyze potential effects of disasters, strategies and methods to deliver public health response to avert these effects.
4. To understand the design, implement and evaluate research on disasters.

UNIT - I:
Environmental Hazards & Disasters: Meaning of Environmental hazards, Environmental Disasters and Environmental stress. Concept of Environmental Hazards, Environmental stress & Environmental Disasters. Different approaches & relation with human Ecology - Landscape Approach – Ecosystem Approach - Perception approach - Human ecology & its application in geographical researches.

UNIT - II:
Types of Environmental hazards & Disasters: Natural hazards and Disasters - Man induced hazards & Disasters - Natural Hazards - Planetary Hazards / Disasters - Extra Planetary Hazards / disasters - Planetary Hazards - Endogenous Hazards - Exogenous Hazards

UNIT - III:
Endogenous Hazards - Volcanic eruption - Earthquakes - landslides - Volcanic Hazards / Disasters - Causes and distribution of Volcanoes - Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions - Earthquake Hazards / disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of - earthquakes - Earthquake Hazards in India - Human adjustment, perception & mitigation of earthquake.

UNIT - IV:
Exogenous hazards / disasters - Infrequent events - Cumulative atmospheric hazards / disasters

Infrequent events: Cyclones - Lightning - Hailstorms

Cyclones: Tropical cyclones & Local storms - Destruction by tropical cyclones & local storms (causes, distribution human adjustment, perception & mitigation) Cumulative atmospheric hazards/ disasters :- Floods - Droughts - Cold waves - Heal waves Floods :- Causes of floods - Flood hazards India - Flood control measures (Human adjustment, perception & mitigation) Droughts :- Impacts of droughts - Drought hazards in India - Drought control measures -

UNIT - V:
Chemical hazards / disasters: Release of toxic chemicals, nuclear explosion , Sedimentation processes: - Global Sedimentation problems - Regional Sedimentation problems - Sedimentation & Environmental problems - Corrective measures of Erosion & Sedimentation

Soil Erosion: Mechanics & forms of Soil Erosion - Factors 7 causes of Soil Erosion - Conservation measures of Soil Erosion.

Biological hazards / disasters: Population Explosion. Emerging approaches in Disaster Management - Three stages: Pre-disaster Stage (preparedness), Emergency Stage, Post Disaster stage – Rehabilitation Application of various technologies in Disaster risk: Geographic information systems - Remote sensing- contribution of remote sensing and GIS - Case study.

Text Books:
1. Disaster Mitigation: Experiences And Reflections by Pradeep Sahni
2. Natural Hazards & Disasters by Donald Hyndman & David Hyndman - Cengage Learning

References:
1. R. B. Singh (Ed) Environmental Geography, Heritage Publishers New Delhi, 1990
2. Savinder Singh Environmental Geography, Prayag Pustak Bhawann 1997
3. Kates, B. I & White, G. F The Environment as Hazards, oxford, New York, 1978
4. R. B. Singh (Ed) Disaster Management, Rawat Publication, New Delhi, 2000

Outcomes:
On completion of this course, students will be able to

1. Integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels, even when limited information is available.
2. Describe, analyze and evaluate the environmental, social, cultural, economic, legal and organizational aspects influencing vulnerabilities and capacities to face disasters.
3. Work theoretically and practically in the processes of disaster management (disaster risk reduction, response, and recovery) and relate their interconnections, particularly in the field of the Public Health aspects of the disasters.
4. Manage the Public Health aspects of the disasters.

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(AJ5130) ENVIRONMENTAL IMPACT ASSESSMENT
(Open Elective)

B.Tech.III Year I-Semester   **L / T / P / C**
                                                             3 / 0 / 0 / 3

Objectives:
1. To know the types of impact, its effect and what kind of action we need to take
2. To understand Monitoring of impact and its methodologies
3. How to predict the impact, tools & water pollution.
4. To Identify and mitigation measures of Soil & noise pollution
5. To learn identification of biological impact and other assessments of impact.

UNIT – I:
Definition of EIA,Types of EIA, Various types of environmental impacts, direct and indirect impacts, cumulative impacts, induced impacts, EIA principles ,process ,benefits and flaws, environmental impact statement, objectives of EIA, Environmental sustainability, identification of potential impacts, affected environment, impact prediction, impact assessment, impact mitigation, selecting the proposed action, environmental monitoring, public consultation.

UNIT – II:
Creation of EIA Data base. compilation, Environmental inventory: Baseline Data Generation, Environmental monitoring networking design (EMND), monitoring Stations, Data products and sources, impact identification methodologies, interaction-Matrix methods, use of the Leopold matrix, checklist methodologies: simple checklists, Descriptive checklists, uses of checklists, network methodologies.

UNIT – III
Meteorological data, Ambient Air quality Monitoring, Air quality standards and regulations, impact prediction, impact prediction approach, utilization of dispersion models, impact prediction tools, Impact assessment(IA): significance and assessment of the impacts, impact mitigation measures.
Impacts on water environment – Sources of pollution, Major pollutants- water quality parameters, surface water contaminants and their impacts, Existing Groundwater Quality environment – standards-prediction and assessment of impacts- mitigation measures.

UNIT – IV:
Soil pollution, causes, soil erosion, desertification, salinisation, acidification, land filling of waste, impacts on soils, conceptual approach: Identification, prediction and assessment of soil quantity-quality impacts, description of existing resources. : Identification and incorporation of mitigation measures. Impacts on noise environment: basics of noise pollution. Noise exposure forecast. Standards and guidelines. Impact prediction. Assessment of impact significance. : Identification and incorporation of mitigation measures

UNIT – V:
Status of wetlands, Threats to wetlands, Ecology impact of Assessment system: importance of biological impact   Assessment, Identification prediction and assessment and significance of biological impacts, Mitigation measures, conservation of flora & fauna
Impacts and socio economic and other environment: Components considerations, human environment socio economic factors, advantages of impact assessment- assessment of impact on historical structures-Mitigation measures.

Text Books:
1. Environmental Impact Assessment,Canter,L.W.,1977, McGraw Hills, New york
2. Environmental Science and engineering, by J. Glyn and Gary W.Hein Ke- Prentice Hall publishers.

References:
1. Technological guidance manuals of EIA. MOEF,Gol.
2. Environmental Impact Assessment,2003,Y. Anjaneyulu,B.S Publications.
3. Environmental Impact Assessment principles and applications, Erickson, P.A,
4. Environmental Impact Assessment: Theory and practice, Dr.M.Anji Reddy, BS Publications.

Outcomes:
On completion of this course, students will be able to
1. Assess Impact and its control.
2. Measure the impact and different checklist to measure the impact.
3. Know the types of prediction tools to assess the impact and prevent the water, soil & Noise pollution.
4. Predict and measure the biological impact and Historical structure impact.

JAYAMUKHI INSTITUTE OF TECHNOLOGICAL SCIENCES

(AUTONOMOUS-UGC, Affiliated to JNTUH)

(AJ5131) BASICS OF CIVIL ENGINEERING
(Open Elective)

B.Tech.III Year I-Semester   **L / T / P / C**
                                                                                              3 / 0 / 0 / 3

Objectives:
1. To know the different building materials and their uses.
2. To learn the phases and techniques in building construction.
3. To understand the surveying and its applications
4. To learn about rail, road and air transportations
5. To know about Soil & Construction Management

UNIT – I:
Civil Engineering & Building Materials: Introduction to civil engineering, Natural and artificial materials & its uses , Cement and its types and uses , Cement Mortars, Concrete as Building Materials, Miscellaneous building materials.
UNIT – II:
Building Construction: Building planning, Foundations, Super structures, Dampness and its prevention, Cost effective Construction techniques.
UNIT – III:
Surveying: Introduction to Surveying, Types of surveying and its application.
UNIT – IV:
Transportation Engineering: Introduction, Advanced transportation planning and uses, Highway alignment and design, Introduction to Railway Engineering and Airport Engineering.
UNIT – V:
Soil Mechanics: Introduction to Soil Mechanics and Classification of soil, Basic definition.
Construction Management: Introduction, Planning, Scheduling and Controlling. Tools of Construction Management(WBS & PERT).

Text Books:
1. Basic Civil Engineering by S.S.Bhavikatti
2. Basics of Civil Engineering by Dr.B.C.Punmia,Ashok K.Jain,Arun K.Jain
3. Basic civil engineering by Shibu Nalpat,Nalpat Publishers
4. Building materials and construction by Arora & Bindra, Dhanput Roy Publications.
References:
1. Basics of Civil Engineering by Subhash Chander; Jain Brothers.
2. Building Construction by PC Verghese PHI
3. Building materials by Duggal, New Age Publications.
4. Text book of surveying by C.Venkataramaiah, Universities Press
5. Surveying theory and practice seventh edition by James M. and Anderson Edward M. Mikhail TATA McGraw Hill.
Outcomes:
On completion of this course, students will be able to
1. Understand about construction materials different stages of construction.
2. Know the different phases in construction.
3. Exposure about surveying.
4. Understand about Transportation and planning.
5. Understand about Soil Mechanics & Construction Management

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(UGC- AUTONOMOUS, Affiliated to JNTUH)

(AJ6132) QUANTITY SURVEYING & COSTING
(Open Elective)

B.Tech.III Year II-Semester **L / T / P / C**
3 / 0 / 0 / 3

Objectives:
1. To know the Measurements of various elements in Civil Engineering works.
2. To learn Detailed Estimate for a given building, Earthwork for Roads & Canals.
3. To understand Writing specifications, performing rate analysis and costing.
4. To prepare Valuation report for a residential building.

UNIT-I:
Measurements: General Items of Works in Building, Standard Units of measurements, Requirements of estimation, Advantages of Estimation, Working out quantities for detailed and abstract estimates-Approximate method of Estimating.

UNIT-II:
Estimate of Buildings: Detailed Estimate of Buildings ,Calculation of quantities of brick work, RCC, PCC, Plastering, White washing and Painting, Estimate of wood works for doors and frames. Preparation of detailed and abstract estimate for framed structures –RCC work, steel work including bar bending schedule.

UNIT-III:
Estimating for Earthwork: Estimate of Earthwork for Roads and Canals

UNIT-IV:
Costing: Objective of specifications, General and detailed specifications for various items of work – Earth work excavation, Lime mortar, Cement concrete, damp proof course, Form work, Brick and stone masonry, Flooring, Painting and wood work. Purpose and requirements of schedule of rates, Procedure of rate analysis.

UNIT-V:
Valuation: Objective of valuation - Definition of various terms such as market value, Book value, Assessed value, Mortgage value, Replacement value, Capital cost, Cost escalation, Sinking fund and Depreciation methods. Fixation of rent, Preparation of valuation report for residential building.

Text Books:
3. B. N. Dutta, "Estimating and Costing in Civil Engineering", UBS Publishers, New Delhi.
4. M. Chakraborty, "Estimating, Costing, Specification and Valuation in Civil Engineering.

References:
2. D.D Kohli and R.C Kohli, "A Text Book of Estimating and Costing (Civil)", S. Chand and Company Ltd.

Outcomes:
On completion of this course, students will be able to
1. Know types of measurements pertaining Civil Engineering works.
2. Prepare detailed estimate for building.
3. Perform rate analysis as per Schedule of Rates (SOR).
4. Prepare valuation report for a residential building.

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(AJ7133) CONSTRUCTION PROJECT MANAGEMENT
(Open Elective)

B.Tech.IV Year I-Semester

L / T / P / C
3 / 0 / 0 / 3

Objectives:
1. To study the Concepts of construction project management.
2. To know Project planning methods PERT & CPM
3. To learn Objectives of construction management
4. To understand Stages of pre-tendering and standard forms of contract
5. To learn Indian Contract Act, Arbitration and Conciliation Act

UNIT – I:
Quantity Surveying: Basic principles of estimating, Project cost estimation-preliminary and detailed estimation. Bill of Quantities (BOQ) and specification.

Rate Analysis: Principles of rate analysis, Direct, Indirect cost and overhead charges. Standard methods followed by government and contractors organization

UNIT – II:
Networks: Rules for networks, Numbering the events, PERT and CPM, Project duration, Calculation of floats, Time estimates, Calculation of slacks and probable completion time.
Applications in Construction Engineering: Cost Analysis and control: Direct cost, Indirect cost, Optimization of cost, Exercises in civil engineering projects, Cost control in construction project, Resource analysis- smoothening and leveling in various construction projects.

UNIT – III:
Construction Management: Introduction, Significance of construction management, Objectives and functions of construction management, Resources for construction industry, Construction team Major problems in construction industry, Functions and responsibilities of construction manager, Case studies, Future of construction management.

UNIT – IV:
Pre- Tendering and procurement: Pre-tending process and stages, Pre-Qualification of bidders, Overview of Procurement Management, Basic Steps in Procurement Process, Public Procurement in India, E-Procurement, , Indian Contract Act 1872, Definition of Contract and its applicability.

Construction contracts: Understanding project contracts, Types of construction contracts, Standard conditions in construction contracts, Contractual documents, Conditions and specifications of contract.

UNIT – V:
Decision making in construction industry: Benefit cost analysis, replacement analysis, Break even analysis, Risk management in construction industry.
Claims and Arbitration: Indian contract act and arbitration act, Variations in work and conditions, Claims and disputes, Liquidated damages. Rights, Responsibilities and duties of client (Owner). Architect, Engineer and Contractor.

Text Books:
1. Moder, J.J., Phillips, C.R., and Davis, E.W., Project Management with CPM and PERT and precedence diagramming, C.B.S. Publishers & Distributors, New Delhi.
2. Gajaria G.T., "Laws Relating to Building and Engineering Contracts in India", M. M. Tripathi Private Ltd.,Bombay, 1982 Tamilnadu PWD Code, 1986

References:
1. S.Seetharaman, Construction Engineering and Management, Umesh publication, New Delhi.
2. Construction planning and Management, U.K.Srivastava, Galgotia Publications Pvt Ltd
3. V. K. Raina., "Construction and Contract Management" Shroff Publishers
4. B. S Ramaswamy, "Contracts and their Management", LexisNexis India, 2008.

Outcomes:
On completion of this course, students will be able to
1. Identify and describe the procedure for calculating project cost
2. Knowledge in management tools CPM & PERT
3. Explain the pre-tendering stages and standard forms of contract
4. Appraise the performance of contract and contract administration
5. Expedite the importance of Contract Act, Arbitration and Conciliation Act