ACADEMIC REGULATIONS (R – 14)
COURSE STRUCTURE
AND
DETAILED SYLLABI

FOR

B. Tech Regular Four Year Degree Courses
(For the Batches Admitted From 2014-2015)

&

B. Tech (Lateral Entry Scheme)
(For the Batches Admitted From 2015-2016)

CIVIL ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

(Affiliated to JNTUA, Ananthapuramu, Approved by AICTE, New Delhi)

R.V.S. NAGAR, CHITTOOR- 517 127 (AP)

FOREWORD

The autonomy is conferred on Sri Venkateswara College of Engineering and technology by JNT University, Anantapur based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independetly in accordance with the set nomrs of the monitoring bodies like UGC and AICTE. It reflects the confidence of the affiliating University in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own curriculum, examination system and monitoring mechanism, independent of the affiliating University but under its observance.

Sri Venkateswara College of Engineering and Technology is proud to win the confidence of all the above bodies monitorng the quality in education and has gladly accepted the responsibility of sustaining, the standards and ethics for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTUA, Anantapur to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, to produce quality engineering graduates to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications needed are to be sought at appropriate time and with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The cooperaton of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and brighter prospects of engineering graduates.

Principal

VISION

Carving the youth as dynamic, competent, valued and knowledgeable professionals who shall lead the Nation to a better future.

MISSION

- ✓ Providing Quality Education, student-centered teaching-learning processes and state-of-art infrastructure for professional aspirants hailing from both rural and urban areas.
- ✓ Imparting technical education that encourages independent thinking, develops strong domain of knowledge, hones contemporary skills and positive attitudes towards holistic growth of young minds.
- ✓ Evolving the Institution into a Center of Academic and Research Excellence.

QUALITY POLICY

Sri Venkateswara College of Engineering and Technology strides towards excellence by adopting a system of quality policies and processes with continued improvements to enhance students' skills and talent for their exemplary contribution to the society, the nation and the world.

Appendix - II

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous)
(Affiliated to J.N.T. University Anantapur, Ananthapuramu).
ACADEMIC REGULATIONS
B.Tech. Regular Four Year Degree Program
(For the batches admitted from the academic year 2014-15)
and

B.Tech. (Lateral Entry Scheme)

(For the batches admitted from the academic year 2015-16)

Applicability — All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2014-2015 onwards. Any reference to "College" in these rules and regulations stands for Sri Venkateswara College of Engineering and Technology (Autonomous).

Extent — All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sri Venkateswara College of Engineering and Technology (A) shall be the Chairman of the Academic Council.

Admission

Admission in to first year of Four Year B.Tech., Degree Program of study in Engineering :

Eligibility — A candidate seeking admission into the first year of four year B.Tech., Degree Program should have

Passed either Intermediate Public Examination conducted by the Board of Intermediate Education, Government of Andhra Pradesh with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination recognized by the Board of Intermediate Education and JNTU Anantapur) or Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by State Board of Technical Education, Government of Andhra Pradesh and JNTU Anantapur) for admission.

Admission — As per the existing stipulations of A.P

Procedure State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B.Tech., Degree Program as follows:

Seats under various categories are filled as per the norms prescribed by the Government of Andhra Pradesh.

3.2 Admission into the second year of four Year B.Tech., Degree Program in Engineering:

3.2.1 Eligibility Candidates qualified in ECET (FDH) and / or admitted by the Convener, ECET (FDH).

In all such cases for admission, when needed, Permissions from the statutory bodies are to be obtained.

3.2.2 Admission Procedure Lateral Entry seats are filled as per the norms prescribed by the Government of Andhra Pradesh from time to time.

4. Programs of study offered leading to the award of B.Tech degree

1. B.Tech (Civil Engineering)
2. B.Tech (Electrical & Electronics Engineering)
3. B.Tech (Mechanical Engineering)
4. B.Tech (Electronics & Communication Engineering)
5. B.Tech (Computer Science & Engineering)
6. B.Tech (Information Technology)
7. B.Tech (Automobile Engineering)

5. Academic year : The College shall follow semester pattern from first year onwards. I, II semesters of First Year of four Year B.Tech., Program shall have a minimum of 14 instructional weeks. From second year onwards each semester shall have a minimum of 16 instructional weeks.

6. Course Structure : Each Program of study shall consist of:

- **General subjects comprise of the following courses: (5 to 10%)**
  i. English Language /Communication Skills / Mind Skills
  ii. Humanities and Social Sciences
  iii. Principles of Management

The above courses are common to all Branches.

- **Basic science subjects comprise of the following courses: (15 to 25%)**
  i. Mathematics
  ii. Physics
  iii. Chemistry

  The above courses are common to all branches.

- **Basic Engineering subjects comprise some of the following courses, depending upon the branch: (15 to 25%)**
  i. Engineering Drawing
  ii. Engineering workshop
  iii. Engineering Mechanics
  iv. Basic Mechanical Engineering
  v. Basic Electrical & Electronics Engineering
  vi. Computer Programming

- **Core Subjects: (45 to 55%)**

  The list of professional subjects is chosen as per the suggestions of the experts to impart broad based knowledge needed in the concerned branch of study.

- **Elective subjects: (10 to 15%)**

  Electives will be offered to the students to diversify the spectrum of knowledge.

  These electives can also be chosen based on the interest of the student to broaden his individual skill and knowledge in the specialized area.

  Main Project: Main Project shall be carried out in the institution / industry during IV year II semester for a period of one semester. The project report shall be submitted to the department after successful completion.

7. Credit System :Credits are assigned based on the following norms.

Subject	Semester Pattern	
	Hours / Week	**Credits**
Theory	01	01
Practical	03	02
Drawing Practice	02	01
Project Work	--	**16**

i. As a norm, for the theory subjects, **one credit** for one contact period per week is assigned.

ii. As a norm, for practical courses **two credits** will be assigned for three contact periods per week.

iii. Tutorials do not carry any credits. However, each of the analytical and problem oriented courses will have one tutorial period per week.

iv. For Project work where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

- The four year curriculum of any B.Tech, Program of study shall have a total of **176** credits.
- In the case of lateral entry students, B.Tech. program of study shall have a total of **132** credits.
- The exact requirements of credits for each subject will be as recommended by the concerned Board of Studies and approved by the Academic Council.

8. Examination System : All components in any Program of study will be Evaluated continuously through internal evaluation and an external evaluation component conducted as semester-end examination.

8.1 Distribution of Marks:

S. No	Examination	Marks %	Examination and Evaluation	Scheme of examination
1	Theory	70	Semester-end examination (external Paper setting and external evaluation)	This Examination question paper in theory subjects will be for a maximum of 70 marks. The question paper shall consists of two parts **Part A:** 5 short answer questions shall be given for a maximum 20 marks with one question from each unit. No choice will be given and all questions carry equal marks. **Part B**: 5 Descriptive/ problematic questions shall be given for a maximum of 50 marks with one question from each unit with internal choice i.e either or type. All questions carry

					equal marks.
		30	20	Mid– Examination of 120 Min. duration (Internal evaluation). The question paper shall be of descriptive type with 5 questions out of which 4 are to be answered and evaluated for 20 marks.	Two (02) mid-term exams, each for 20 marks are to be conducted. Better of the two shall be considered for awarding internal marks. **Mid-I:** After first spell of instructions(First 2 Units) **Mid-II:** After second spell of instructions (Last 3 Units.)
			10	Assignment (Internal evaluation)	Two assignments shall be given and each will be evaluated for 10 marks. Average of two Assignments shall be taken as internal marks for the assignments. **Assignment-I:** After first spell of instructions(First 2 Units) **Assignment-II:** After second spell of instructions (Last 3 Units.)
2	Laboratory	70	Semester-end Lab Examination (External evaluation)		70 marks are allotted for laboratory examination during semester-end.
		30	20	Continuous evaluation	Performance in laboratory experiments and Record are considered.
			10	Internal test	Practical Test at the end of the semester.
					➢ Marks scored in the continuous evaluation and internal test are considered for awarding internal marks.

3	Drawing	70	Semester-end drawing Examination (External evaluation)		70 marks are allotted for drawing examination during semester-end.
		30	20	Continuous evaluation	Performance in Drawing classes will be considered.
			10	Internal test	Two tests will be conducted. Better of the two will be taken.
					➢ Marks scored in the continuous evaluation and internal test are considered for awarding internal marks.
4	Project Work	300	200	External evaluation	Semester-end Project Viva-Voce Examination by a Committee as detailed under 8.2.
			100	Internal evaluation	Continuous evaluation by the Departmental Committee

Wherever the Question paper is different from the conventional pattern, the concerned pattern of question paper will be given at the end of the syllabus of that subject.

8.2 Project Work Evaluation : The Semester-End Examination (Viva-voce) shall be conducted by a Committee consisting of External examiner (nominated by the Chief Controller of Examinations), HOD, & Supervisor. The evaluation of project work shall be conducted at the end of the IV year second semester. The Internal Evaluation shall be made by the Departmental Committee, on the basis of two project reviews of each student.

8.3 Eligibility to appear for the Semester-End examination:

8.3.1 A student shall be eligible to appear for Semester –End examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

8.3.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds by the College Academic Committee. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

8.3.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned and the candidate will be detained.

8.3.4 Detained students are not eligible to take their end examination of that class and their registration shall stand cancelled.

8.3.5 A student detained due to shortage of attendance, will have to

repeat that semester when offered next.

8.4 Evaluation: Following procedure governs the evaluation.

8.4.1 The marks for the internal evaluation components will be added to the external evaluation marks secured in the Semester –End examinations, to arrive at total marks for any subject in that semester.

8.4.2 Performance in all the subjects is tabulated program-wise and will be scrutinized by the Results Committee and subject-wise marks lists are finalized. Total marks obtained in each subject are converted into letter grades.
Results Committee comprises of Principal, Controller of Examinations, one Senior Professor nominated by the Principal and the University Nominee.

8.4.3 Student-wise tabulation is done and student-wise Grade Sheet is generated and issued to the students.

8.5 Revaluation / Recounting:

Students shall be permitted for request for recounting/revaluation of the Semester-End examination answer scripts within a stipulated period after payment of prescribed fee. After recounting or revaluation, records are updated with changes if any and the student will be issued a revised grade sheet. If there are no changes, the same will be intimated to the students.

8.6 Supplementary Examination:

8.6.1 In addition to the regular Semester- End examinations conducted, the College may also schedule and conduct supplementary examinations for all the subjects of other semesters when feasible for the benefit of students. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

9. Academic Requirements for Promotion/ completion of regular B.Tech Program of study:

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/completion of regular B.Tech Program of study.

9.1 For students admitted in B.Tech (Regular) Program:

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design drawing subject or project, if he secures not less than 35% of marks in the Semester End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from second year to third year only if he fulfills the academic requirement of securing 44 credits from:

a) Two regular and two supplementary examinations of I-year I semester.

b) Two regular and one supplementary examinations of I-year II semester.

c) One regular and one supplementary examination of second year I semester.

d) One regular examination of II- year II Semester.

Irrespective of whether the candidates appear for Semester-End examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year Program of study only if he fulfills the academic requirements of securing 66 credits from:

a) Three regular and three supplementary examinations of I-year I semester.
b) Three regular and two supplementary examinations of I-year II Semester
c) Two regular and two supplementary examination of second year I semester.
d) Two regular and one supplementary examinations second year II semester.
e) One regular and one supplementary examination of third year I semester.
f) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appears for the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits by sections 9.1(ii) and 9.1 (iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III year I semester or IV year I semester as the case may be.

iv. A student shall register for all the 176 credits and earn all the 176 credits. Marks obtained in all the 176 credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn 176 credits as indicated in the course structure within eight academic years from the year of his admission shall forfeit his seat in B. Tech., Program and his admission stands cancelled.

9.2 For Lateral Entry Students (batches admitted from 2015-2016):

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the Semester-End examination and a minimum of 40% of marks in the sum total of the internal evaluation and Semester-End examination taken together.

ii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of securing 44 credits from the following examinations.

a) Two regular and two supplementary examinations of II year I semester.
b) Two regular and one supplementary examination of II year II semester.

c) One regular and one supplementary examination of III year I semester.

d) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appear the Semester-End examination or not as per the normal Course of study and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I semester.

i. A student shall register for all 132 credits and earn all the 132 credits. Marks obtained in all 132 credits shall be considered for the award of the class based on CGPA.

ii. A student who fails to earn 132 credits as indicated in the Course structure within six academic years from the year of his admission shall forfeit his seat in B.Tech., Program and his admission stands cancelled.

9.3 **Audit Courses:** Any student who wishes to pursue audit course can register for the same with the concerned teacher and attend to the classes regularly. No examination will be conducted, no grade will be given for the audit courses. However such of those students who have registered and got the requisite attendance of 75% in the audit course, it will be mentioned in their grade sheet.

10. **Transitory Regulations:**

Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch they join later.

A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years, for the award of B.Tech Degree.

11. **Grades, Grade Point Average and Cumulative Grade Point Average**

11.1 **Grade System:** After all the components and sub-components of any subject (including laboratory subjects) are evaluated, the final total marks obtained will be converted to letter grades on a **"10 point scale"** described below.

% of marks obtained	Grade	Grade Points(GP)
90 to 100	A+	10
80 to 89	A	9
70 to 79	B	8
60 to 69	C	7
50 to 59	D	6

40 to 49	E	5
Less than 40 in sum of Internal & External (or) Less than 35 in External	F	0
Not Appeared	N	0

- **Pass Marks:** A student is declared to have passed theory and/ or laboratory subject, if he secures minimum of 35% marks in external examination, and a minimum of 40% marks in the sum total of internal evaluation and external examination taken together. Otherwise he will be awarded fail grade – F in such subject irrespective of internal marks.
- F is considered as a fail grade indicating that the student has to pass the semester-end examination in that subject in future and obtain a grade other than F and N for clearing this subject.

11.2 Grade Point Average (GPA):

Grade Point Average (GPA) will be calculated as given below on a "10 Point scale" as an Index of the student's performance at the end of each semester:

$$\textbf{GPA} = \frac{\sum(\boldsymbol{CXGP})}{\sum \boldsymbol{C}}$$

Where C denotes the credits assigned to the subjects undertaken in that semester and GP denotes the grade points earned by the student in the respective subjects.

11.3 Cumulative Grade Point Average (CGPA):

At the end of every semester, a Cumulative Grade Point Average (CGPA) on a 10 Point scale is computed considering all the subjects passed up to that point as an index of overall Performance up to that Point as given below:

$$\textbf{CGPA} = \frac{\sum(\boldsymbol{CXGP})}{\sum \boldsymbol{C}}$$

Where C denotes the credits assigned to subjects undertaken upto the end of the current year/semester and GP denotes the grade points earned by the student in the respective courses.

11.4 Grade Sheet: A grade sheet (Marks Memorandum) will be issued to each student Indicating his performance in all subjects registered in that semester Indicating the GPA and CGPA. GPA and CGPA will be rounded off to the second place of decimal.

12. Consolidated Grade Sheet: After successful completion of the entire Program of study, a Consolidated Grade Sheet containing performance of all academic years will be issued as a final record. Transcripts will also be issued, if required, after payment of requisite fee.

13. Award of Degree : The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur,

Ananthapuramu on the recommendation of the Principal of SVCET (Autonomous), Chittoor.

13.1 Eligibility : A student shall be eligible for the award of B.Tech., Degree if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the program of study for which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
- Obtained CGPA greater than or equal to 5.0 (Minimum requirement for declaring as passed.)

13.2 Award of Class : Declaration of Class is based on CGPA.

Cumulative Grade Point Average	Class
≥7.0	First Class with Distinction
≥6.0 and<7.0	First Class
>5.0 and <6.0	Second Class
5.0	Pass Class

14. With – Holding of Results: If the candidate has not paid dues to the university/ college or if any case of in-discipline is pending against him, the result of the candidate shall be withheld and he will not be allowed / promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

15. Additional academic regulations:

i. A regular student has to complete all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years.

ii. A student can appear for any number of supplementary examinations till he clears all subjects within the stipulated period.

iii. A grade sheet (marks memorandum) will be issued to the student indicating his performance in all the courses of that semester along with the GPA and CGPA.

iv. Any canvassing / impressing the administration, examiners, faculty or staff in any form, the candidate is liable for punishment as per the mal practice rules appended here with.

v. When a student is absent for any examination (internal or external) he is treated as to have appeared and obtained zero marks in that component (course) and grading is done accordingly.

vi. When a component is cancelled as a penalty, he is awarded zero marks in that component.

16. Amendments to regulations:

The Academic Council of Sri Venkateswara College of Engineering and Technology (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other Policy relevant to the needs of the society or industrial requirements etc.., without prior notice.

17. General:

Where the words "he", "him", "his", "himself" occur in the regulations, they include "she", "her", "herself".

Note: Failure to read and understand the regulations is not an excuse.

SRI VENKATESWARA COLLEGE OF ENGINNERING & TECHNOLOGY
(AUTONOMOUS)
(AFFILIATED TO JNTUA, ANANTAPUR)
RULES FOR DISCIPLINARY ACTION FOR MALPRACTICE / 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/year. The Hall Ticket of the candidate is to be cancelled.

3.	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 to appear for the remaining examinations of the subjects of that Semester/year.
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 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 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.	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 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 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.

6.	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 of seat.
7.	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 impostor is an outsider, he will be handed over to the police and a case is registered against him.

8.	Refuses to obey the orders of the Chief Superintendent / Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in-charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction or property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
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.	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.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Examination committee for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

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

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)
R.V.S. NAGAR, CHITTOOR- 517 127 ANDHRA PRADESH
DEPARTMENT OF CIVIL ENGINEERING

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P/D		Internal	External	Total
1	14AHS01	Technical English - I	3	-	-	3	30	70	100
2	14AHS02	Engineering Mathematics-I	3	1	-	3	30	70	100
3	14AHS03	Engineering Chemistry	3	1	-	3	30	70	100
4	14AME01	Engineering Drawing	2	-	4	4	30	70	100
5	14ACE01	Engineering Mechanics	3	1	-	3	30	70	100
6	14AHS07	Technical English Lab - I	-	-	3	2	30	70	100
7	14AHS08	Engineering Chemistry Lab	-	-	3	2	30	70	100
8	14ACE03	AutoCAD Fundamentals Lab	-	-	3	2	30	70	100
		TOTAL	**14**	**3**	**13**	**22**	**240**	**560**	**800**

Scheme of Instruction and Examination under R14 Regulations

I-B.TECH., I-SEMESTER

I-B.TECH., II-SEMESTER

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total
1	14AHS06	Engineering Mathematics - II	3	1	-	3	30	70	100
2	14AHS04	Engineering Physics	3	1	-	3	30	70	100
3	14AHS05	Environmental Science	3	1	-	3	30	70	100
4	14ACS02	Programming in C & Data Structures	3	2	-	4	30	70	100
5	14ACE04	Strength of Materials -I	3	1	-	3	30	70	100
6	14AHS09	Engineering Physics Lab	-	-	3	2	30	70	100
7	14ACS04	C & Data Structures Lab	-	-	3	2	30	70	100
8	14AME03	Engineering Workshop	-	-	3	2	30	70	100
		TOTAL	**15**	**6**	**9**	**22**	**240**	**560**	**800**

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Scheme of Instruction and Examination under R14 Regulations

II-B.TECH., I-SEMESTER

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P/D		Internal	External	Total
1	14AHS10	Probability & Statistics	3	1	-	3	30	70	100
2	14ACE06	Strength of Materials - II	3	1	-	3	30	70	100
3	14ACE07	Fluid Mechanics	3	1	-	3	30	70	100
4	14ACE08	Surveying	3	1	-	3	30	70	100
5	14ACE09	Building Materials and Construction	3	-	-	3	30	70	100
6	14ACE10	Building planning and Computer Aided Drafting of Buildings	2	-	3	3	30	70	100
7	14ACE13	Civil Engineering Material Testing Lab	-	-	3	2	30	70	100
8	14ACE14	Surveying Lab	-	-	3	2	30	70	100
		TOTAL	**17**	**4**	**9**	**22**	**240**	**560**	**800**

II-B.TECH., II-SEMESTER

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P/D		Internal	External	Total
1	14AEE14	Basic Electrical Engineering and Mechanical Engineering	3	1	-	3	30	70	100
2	14ACE16	Structural Analysis -I	3	1		3	30	70	100
3	14AHS12	Managerial Economics and Financial Analysis	3	1	-	3	30	70	100
4	14ACE17	Hydrology and Irrigation Engineering	3	1		3	30	70	100
5	14ACE18	Hydraulics and Hydraulic Machinery	3	1	-	3	30	70	100
6	14ACE19	Engineering Geology	3	1	-	3	30	70	100
7	14ACE20	Fluid Mechanics and Hydraulic Machinery Lab	-	-	3	2	30	70	100
8	14ACE21	Engineering Geology Lab	-	-	3	2	30	70	100
		TOTAL	**18**	**6**	**6**	**22**	**240**	**560**	**800**
		Audit Course							
9	14AHS15	Quantitative Aptitude and Reasoning-I	3	-	-	-	-	-	-

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Scheme of Instruction and Examination under R14 Regulations

III-B.TECH., I-SEMESTER

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total
1	14AHS13	Technical English – II	3	1	-	3	30	70	100
2	14ACE24	Design and Drawing of Reinforced Structures	3	1	-	3	30	70	100
3	14ACE25	Structural Analysis –II	3	1	-	3	30	70	100
4	14ACE26	Water Resources Engineering	3	1	-	3	30	70	100
5	14ACE27	Environmental Engineering - I	3	1	-	3	30	70	100
6	14ACE28	Geotechnical Engineering - I	3	1	-	3	30	70	100
7	14AHS14	Technical English Lab –II	-	-	4	2	30	70	100
8	14ACE29	Geotechnical Engineering Lab	-	-	4	2	30	70	100
9.	14ACE59	Comprehensive Online Examination	-	-	-	1	-	100	100
		TOTAL	**18**	**6**	**8**	**23**	**240**	**660**	**900**
		Audit Course							
10.	14AHS16	Quantitative Aptitude and Reasoning-II	3	-	-	-	-	-	-

III-B.TECH., II-SEMESTER

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total
1	14ACE30	Design and Drawing of Steel Structures	3	1	-	3	30	70	100
2	14ACE31	Transportation Engineering	3	1	-	3	30	70	100
3	14ACE32	Estimation, Costing and Valuation	3	1	-	3	30	70	100
4	14ACE33	Environmental Engineering - II	3	1	-	3	30	70	100
5	14ACE34	Geotechnical Engineering - II	3	1	-	3	30	70	100
6	14ACE35	Choice Based Credit Courses (Inter Department)	3	1	-	3	30	70	100
7	14ACE36	Environmental Engineering Lab	-	-	4	2	30	70	100
8	14ACE37	Concrete & Highway Materials Lab	-	-	4	2	30	70	100
9.	14ACE60	Comprehensive Online Examination	-		-	1	-	100	100
		TOTAL	**18**	**6**	**8**	**23**	**240**	**660**	**900**
		Audit Course							
10.	14ACE58	Total Quality Management in Civil Engineering	3	-	-	-	-	-	-

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Scheme of Instruction and Examination under R14 Regulations

IV-B.TECH., I-SEMESTER

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P/D		Internal	External	Total
1	14ACE38	Finite Element Methods in Civil Engineering	3	1	-	3	30	70	100
2	14ACE39	Design and Drawing of Irrigation Structures	1	-	3	3	30	70	100
3	14ACE40	Bridge Engineering	3	1	-	3	30	70	100
4	14ACE41	Advanced Structural Engineering	3	1	-	3	30	70	100
5		**CBCC Dept. Specific**	3	1	-	3	30	70	100
	14ACE42	Prestressed Concrete							
	14ACE43	Remote Sensing and GIS							
	14ACE44	Traffic Engineering							
6		**CBCC Dept. Specific**	3	1	-	3	30	70	100
	14ACE45	Urban and Regional Planning							
	14ACE46	Repair and Rehabilitation of Structures							
	14ACE47	Construction Technology and Project Management							
7	14ACE48	CAD Lab	-	-	4	2	30	70	100
8	14ACE49	GIS Lab	-	-	4	2	30	70	100
		TOTAL	**16**	**5**	**11**	**22**	**240**	**560**	**800**
		Audit Course							
9	14AMB02	Professional Ethics	3	-	-	-	-	-	-

IV-B.TECH., II-SEMESTER

S.No	Course Code	Subject	Hours/Week			Credits	Maximum Marks		
			L	T	P		Internal	External	Total
1	14ACE50/ 14ACE51/ 14ACE52	MOOC (Set of subjects to be specified by the respective board)	-	-	-	3	30	70	100
2	14ACE53/ 14ACE54/ 14ACE55	MOOC (Set of subjects to be specified by the respective board)	-	-	-	3	30	70	100
3.	14ACE57	Comprehensive Viva-Voce	-	-	-	2	-	100	100
4.	14ACE56	Project Work	-	-	-	12	60	140	200
		TOTAL	**-**	**-**	**-**	**20**	**120**	**380**	**500**

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I B.Tech I Semester	**L**	**T**	**P**	**C**
Code:14AHS02	**3**	**1**	**-**	**3**

ENGINEERING MATHEMATICS-I

(Common to all branches)

Outcomes:

After completion of the course the student will be able to

1. Define the areas of application of differential equations.
2. Apply the principles of differential equations, functions of variables separable, integration, Laplace transforms andvector calculus to the engineering and scientific problems.
3. Solve problems using various computational methods.

UNIT-I

DIFFERENTIAL EQUATIONS: Linear and Bernoulli's Equations – Non - homogenous Linear Differential equation of second and higher order with constant co-efficient. Newton's law of cooling- **L**-R-C circuits.

UNIT-II

FUNCTIONS OF SEVERAL VARIABLES: Maxima and Minima for functions of two variables – Lagrange's method of multipliers of 3 variables only.

Curve Tracing: Cartesian and polar curves. **Radius of Curvature**: Cartesian and polar curves.

UNIT-III

APPLICATIONS OF INTEGRATION: Length of an arc and area using line integral.

Multiple Integrals: Double and Triple integrals -Change of variables-Change of Order of integration (Cartesian and polar forms). Surface area and Volume of solid ofrevolution.

UNIT-IV

LAPLACE TRANSFORMS: Laplace transforms of standard functions - First Shifting Theorem - Transforms of derivatives and integrals- Unit step Function – Second Shifting Theorem –Laplace transforms of Periodic functions – Inverse Laplace transforms - Convolution theorem.

UNIT-V

VECTOR CALCULUS: Gradient, Divergence, Curl and their properties (without identities).

Vector Integration: Line Integrals – Potential functions - Area, Surface and Volume integrals -

Green's theorem- Stoke's theorem& Gauss Divergence theorems (without proof) – problems on Green's,Stoke's and Gauss's Theorem

Text Books:

1. B.V.Ramana, *A Text book of Engineering Mathematics-I*, Tata Mc Grawhill
2. T.K.V.Iyengar, B.Krishna Gandhi and others, *A Text book of Engineering Mathematics –I*, S.Chand andcompany.
3. Dr.B.S.Grewal, *Higher Engineering Mathematics*.
4. E.Rukmangadachari and Keshava Reddy, *A Text book of Engineering Mathematics-I*, Pearson Education

References:

1. C.Sankaraiah,A Text book of Engineering Mathematics, VGS book links
2. Thomson ,*A Text book of Engineering Mathematics*, Book Collection
3. N.Bail, M.Goyal & C.Walking, *A Text book of Advanced Engineering Mathematics-A* computer approach

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**3**	**3**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**2**	**3**
CO2	**3**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**3**	**2**
CO3	**2**	**2**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**3**	**2**

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I B.Tech I Semester	**L**	**T**	**P**	**C**
Code:14AHS04	**3**	**1**	**-**	**3**

ENGINEERING PHYSICS

(Common to EEE,ECE,CSE & IT)

Outcomes

After completion of the course the student will be able to

1. Apply the knowledge of Physics in the field of Communications, Electrodynamics, Solid State Physics and Optics.
2. Develop the working of different tools and devices
3. Develop problem solving skills and understanding.

UNIT I

OPTICS: Interference- Interference in thin films by reflection – Newton Rings. Diffraction- Fraunhofer diffraction due to single slit-Diffraction Grating.

MODERN OPTICS

Introduction to lasers – Characteristics of lasers – Spontaneous and stimulated emission of radiation – Einstein's coefficients – population inversion –Ruby laser - He-Ne laser Applications of laser. Introduction to fiber optics – Principle of optical fiber – Acceptance angle and acceptance cone – Numerical aperture – Classification of Optical Fibers- Attenuation in optical fibers – Optical fiber communication system- Applications of optical fibers.

UNIT II

CRYSTAL STRUCTURES AND X-RAY DIFFRACTION: Introduction – Space lattice – Basis – Unit cell – Lattice parameter – Crystal systems – Bravais lattices – Structure and packing fractions of Simple cubic, body centered cubic, face centered cubic crystals-Directions and planes in crystals – Miller Indices – Separation between successive [h k l] planes – Bragg's law-X-Ray Diffraction by Powder method

ULTRASONICS Introduction – Production of ultrasonics by piezoelectric method – Properties and detection of Ultrasonic waves – Applications in non-destructive testing.

UNIT III

PRINCIPLES OF QUANTUM MECHANICS: Wave and particles – de Broglie hypotheses – Matter waves – Schrödinger time independent wave equation – Physical significance of wave function – Particle in one dimensional box

FREE ELECTRON THEORY: Classical free electron theory – Equation for electrical conductivity - Quantum free electron theory – Fermi-Dirac distribution –Kronig-Penny model (qualitative)

UNIT IV

DIELECTRIC PROPERTIES: Introduction – Dielectric constant – Electronic, Ionic and Oriental polarizations (qualitative) – Local Field- Clausius-Mossotti equation – Piezoelectricity - Ferroelctricty.

MAGNETIC PROPERTIES

Introduction – magnetic moment – Classification of magnetic materials – Hysteresis curve – Hard and Soft Magnetic Materials-Applications.

UNIT V

SEMICONDUCTORS: Introduction – Intrinsic and extrinsic Semiconductors–Fermi level-Equation of conductivity - Drift and diffusion – Einstein's equation – Hall Effect.

SUPERCONDUCTORS: General properties of superconductors – Meissner effect – Penetration depth – Type Iand Type II superconductors – Flux quantization – Josephson effect – Application of superconductors.

NANOMATERIALS: Introduction– Basic principles of nanomaterials – Growth of nanomaterials: Sol-Gel method-Chemical vapor deposition–Properties of nanomaterials-Carbon Nano Tubes -Application of carbon nano tubes and nanomaterials.

Text Books:

1. Avadhanulu and *KshirasagarA Text book of Engineering Physics*, Revised Edition, S.Chand, New Delhi2014
2. Gaur and Gupta:*Engineering Physics, New Delhi*, DhanpatRai Publishers, 2010
3. K. Thyagarajan*: Engineering Physics,Delhi*, Tata Mcgraw Hill Publishers, 2013.

Reference Books:

1. Pillai.S.O*: Solid State Physics*, 6thedition,NewDelhi:New Age International, 2005.
2. Chattopadhyay, K.K; Banerjee,A.N: *Introduction to Nano Science and Technology*,New Delhi:PHI,2009 .
3. Resnick, Halliday and Walker*: Fundamentals of Physics*, 9th Edition, New Delhi: Wiley Publishers,2010.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	-	-	-	-	-	-	-	-	2	1
CO2	3	2	-	2	1	-	-	-	-	-	-	1	-	-
CO3	3	2	-	2	1	-	-	-	-	-	-	1	-	-

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I B.Tech I Semester	**L**	**T**	**P**	**C**
Code:14AHS05	**3**	**1**	**-**	**3**

ENVIRONMENTAL SCIENCE

(Common to EEE,ECE,CSE & IT)

Outcomes:

After completion of the course the student will be able to

1. develop critical thinking (or) observation skills and apply them in the analysis of a problem (or) question relatedto the environment.
2. analyse and interpret the complex relationships between natural and human systems.
3. analyse and interpret the fundamental physical, chemical and biological principles that govern natural process.

UNIT-I

ENVIRONMENT AND NATURAL RESOURCE MANAGEMENT: Definition, Scope and Importance of Environmental Science, Need for Public Awareness, Components of Environment (Atmosphere, Hydrosphere, Lithosphere and Biosphere) Renewable and non-renewable Natural resources and associated problems: **Forest resources:** Use and over-exploitation, deforestation, case studies – Timber extraction, Mining, Dams and other effects on forest and tribal people. **Water resources:** Use and over utilization of surface and ground water, Floods, Drought, conflicts over water, dams-benefits and problems. **Food resources**: Sources of food, impacts of overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. **Energy resources:** Renewable and Non-renewable energy resources

UNIT-II

ECOSYSTEMS: Concept of an ecosystem, Structure and function of an ecosystem (Producers, Consumers and decomposers) – Energy flow in the ecosystem – Food chains, food webs and ecological pyramids – Ecological Succession.
TYPES OF ECOSYSTEMS:

a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem

d. Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT-III

BIODIVERSITY AND ITS CONSERVATION: Introduction, Definition, Types of biodiversity (genetic, species and ecosystem diversity)- Bio-geographical classification of India, Values of biodiversity(Consumptive use, Productive use, Social use, Ethical use, Aesthetic and Option values)- India as a mega diversity nation-Hot spots of India-Threats to biodiversity(habitat loss, Poaching of wildlife, man-wildlife conflicts)-Endangered and endemic species of India-Conservation of biodiversity(In-situ and Ex-situ conservation of biodiversity).

UNIT-IV

ENVIRONMENTAL POLLUTION AND ACT'S: Definition, causes, effects and control measures of:

a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise Pollution e. Thermal Pollution f. nuclear hazards. Solid Waste Management: Causes, effects and control measures of urban and industrial wastes.

ACT'S: Environment Protection Act-Air (Prevention and Control of Pollution) Act-Water (Prevention and control of Pollution) Act-Wildlife Protection Act-Forest Conservation Act-

Disaster management: Floods, Earthquake, Cyclone and Landslides.

UNIT-V

SOCIAL ISSUES AND THE ENVIRONMENT: From unsustainable to sustainable development, Water conservation(rainwater harvesting, watershed management)-Resettlement and rehabilitation of people its problems and concerns, Environmental ethics, Global warming, Acid rain, Ozone layer depletion-Population growth, variation among nation, Population explosion-Family Welfare Programme-Environment and human health-Human Rights-Value Education-HIV/AIDS-Women and Child Welfare Programmes-Role of Information Technology in Environment and human health.

Field Work: Visit to local polluted site-Urban/Industrial.

Text Books:

1. ErachBharucha, *Textbook of Environmental Studies for Undergraduate courses by from UGC.*
2. Dr.Raghavan Nambiar.K, *Text Book of Environmental Studies*, Sitech publications, 2010.
3. Benny Joseph, *Environmental Studies* by Mc.GrawHill Publications, 2010.

References:

1. Dr.Suresh.K.Dhameja, *Environmental Studies*, S.K. Kataria& Sons Publishers, 2012.
2. Sharma. J.P.,*Comprehensive Environmental Studies*, Laxmi Publications, 2010.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	-	-	-	-	-	-	-	1
CO2	3	3	-	2	1	-	-	-	-	-	-	1
CO3	3	3	-	2	1	-	-	-	-	-	-	1

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I B.Tech I Semester	**L**	**T**	**P**	**C**
Code:14AHS09	**-**	**-**	**3**	**2**

ENGINEERING PHYSICS LAB

(Common to EEE,ECE,CSE & IT)

Outcomes:

After completion of the course the student will be able to

1. analyze scientific data from different physics laboratory instruments.
2. Develop manipulative, observational and reporting skills.
3. Use modern devices and technologies based on optics, electrodynamics,semiconductors, lasers and optical fibers.

ENGINEERING PHYSICS LAB:

A minimum of 10 experiments to be conducted during the academic year

1. Determine the wavelengths of given light source - Spectrometer.
2. Dispersive power of prism
3. Determine the wavelength of given laser source – Diffraction grating.
4. Determine the particle size by using laser source
5. Determine the thickness of thin wire by Interference.
6. Determine the radius of curvature of given plano convex lens by forming Newton Rings.
7. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
8. Numerical Aperture of an optical fiber.
9. Bending losses in Optical Fiber.
10. Determine the wavelength of Laser source by using optical fiber.
11. Determination of Hall Coefficient and Carrier concentration in the given Semiconductor.
12. Determine the energy loss of ferromagnetic sample by plotting B-H curve
13. Energy gap of a given semiconductor.
14. Determine the Dielectric constant of Barium Titanate.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	1	-	-	-	-	-	-	-	-	-	-	-
CO3	3	-	-	-	1	-	-	-	-	-	-	-

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	L	T	P	C
I B.Tech II Semester				
Code:14AHS01	**3**	**-**	**-**	**3**

TECHNICAL ENGLISH-I

(Common to EEE,ECE,CSE & IT)

Outcomes:

After completion of the course the student will be able to

1. Develop language skills by observing the rules of grammar, vocabulary and composition that arenecessary.
2. Apply intelligent and innovative use of rules in order to be able to generatecreative output in tune with the demands of industry and the corporate world.
3. Develop skills in comprehension and the ability to express themselvesthrough listening, reading, speaking and writing.
4. Distinguish between formal English and functional English.

UNIT-I **EMERGING TECHNOLOGIES:**

Solar Thermal Power-Cloud Computing

UNIT-II **ENVIRONMENTAL CONSCIOUSNESS:**

Climate Change- Green cover-Pollution

UNIT-III **ENERGY:**

Renewable and Non-Renewable sources-Alternative sources-Conservation-Nuclear Energy

UNIT-IV **ENGINEERING ETHICS:**

Challenger Disaster-Biotechnology-Genetic Engineering-ProtectionFrom Natural Calamities

UNIT-V **TRAVEL AND TOURSIM:**

Advantages and Disadvantages of Travel –Tourism - Atithi Devo Bhava-Tourism in India**.**

- **The teacher shall cover the following components which are given as exercises in theprescribed text book while teaching each of the five units listed above.**

REMEDIAL GRAMMAR:

1. Articles
2. Prepositions
3. Time & Tense
4. Sentence Construction-Strategies (avoiding Repetition and ambiguity)
5. Sentence Transformation (Degrees, Voice, Speech & synthesis)
6. Common Errors in English

VOCABULARY:

1. Roots-Prefixes-Suffixes(RPS Method)
2. Synonyms
3. Antonyms
4. Phrasal Verbs
5. Idioms
6. One-word substitutes

WRITING PRACTICE (COMPOSITION):

1. Paragraph-Writing(Descriptive, Narrative, Persuasive, Expository and Creative)
2. Summarizing
3. Note-Making and Note taking
4. Letter-Writing (Formal & Informal)
5. Report writing

Texts for classroom study:

(Prescribed Text book: Mindscapes-English for Technologies and Engineers, published by Orient Black Swan, 2012)

Reference Books:

1. M. Ashraf RizWi, *"Technical English Communication"*, Tata Mc Graw Hill, Latest Edition.
2. V.R. Narayana Swamy, *"Strengthen Your Writing"*, 1st edition, Orient longman, 2003.
3. Thomas Elliot Berry. *"The Most Common Mistakes in English Usuage"*, 1st Edition, Tata McGraw Hill,2004.
4. Margaret M Maison, *"Examine your English"*, 1st edition, Orient Longman, 1999.
5. Andrea J Rutherford ,*Basic communication skills for Technology*, Pearson Education, Asia.
6. MeenakshiRaman Sangeetha Sharma, *Technical communication* , Oxford
7. *Cambridge International of Phrasal Verbs*, Cambridge.
8. Martin Hewings ,*Essential English Grammar* , Cambridge
9. John Eastwood ,Oxford Practice Grammar, Oxford.
10. Daniel Jones ,*English Pronouncing Dictionary*, Oxford.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	3		-	1	1
CO2	3	2	-	-	-	-	-	-	-	3		-	2	1
CO3	3	3	-	-	-	3	-	-	-	3		-	1	2
CO4	2	2	-	-	-	1	-	-	-	3		-	1	2

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Code:14AHS06	**3**	**1**	**-**	**3**

ENGINEERING MATHEMATICS-II

(Common to All Branches)

Outcomes:

After completion of the course the student will be able to

1. Explore application of matrices, interpolation, partial differential equations and transforms.
2. Apply the principles of matrices, curve fitting, partial differential equations, transforms etc. To the engineering and scientific problems.
3. Provide s o l u t i o n s using various computational methods.

UNIT-I

MATRICES: Rank of a matrix-Echelon form, Normal form -solution of linear system of homogeneous and non-homogeneous equations -Gauss elimination method.

Eigen values and Eigen vectors - Cayley-Hamilton theorem - Linear Transformations - Orthogonal transformations - Diagonalization of a matrix. Quadratic forms- Reduction of Quadratic form to Canonical form and their nature.

UNIT-II

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Introduction - The Bisection method -The method of false position - Newton - Raphson method.

Curve Fitting: Fitting a straight line - Second degree curve- Exponential curve - Power curve by method ofleast squares.

Interpolation: Forward Differences - backward differences-Newton's forward and backward differencesformulae for interpolation - Lagrange's interpolation formula - Inverse interpolation .

UNIT-III

Numerical differentiation-First and second order derivatives- . Numerical integration-Trapezoidal rule -Simpson's 1/3 rule - Numerical solutions of ordinary differential equations by Taylor's series-Picard's method of successive Approximations - Euler's Method – Runge-Kutta Methods – Predictor - corrector method - Milne's method

UNIT-IV

FOURIER SERIES: Fourier series- Even and odd functions-Fourier series in an arbitrary interval - - Half- range Fourier sine and cosine expansions. Fourier integral theorem (statement) -Fourier sine and cosine integrals. Fourier Transforms - Fourier sine and cosine Transforms.

UNIT-V

PARTIAL DIFFERENTIAL EQUATIONS: Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Method of separation of variables - solution of one dimensional wave equation, heat equation and two – dimensional Laplace's equation.

RANSFORMS: Inverse Z- transforms – Properties - Damping rule- Shifting rule - Initial and final value theorems. Convolution theorem - Solution of difference equations by Z- transforms.

Text Books:

1. Iyengar T.K.V., Krishna Gandhi.B and others, *Mathematical Methods*, New Delhi, S.Chand & company,2012.
2. Sankar rao G.,Kesav Reddy.E, *Mathematical Methods*, International publishinghouse,Pvt.ltd
3. Sastry .S.S., *Introduction to Numerical analysis*.New Delhi,Prentice Hall ofIndia,2003
4. Dr..Grewal .B.S, *Higher Engineering Mathematics*,New Delhi,Khanna Publishers,2004

References:

1. Erwin Kreyszig ,*Advanced Engineering Mathematics*. John Wiley & Sons.
2. Jain.M.K, IyengarT.K.V,.Jain.R.K. *Numerical Methods for Scientific and Engineering Computation.* Newage International publishers.
3. Pal, *Mathematical Methods* ,Oxford University Press,2009.
4. Ranganatham.S,Prasad M.S.S.N.,Ramesh Babu.V, *Numerical Analysis*, S.Chand & company
5. Sankaraiah .C, *Mathematical Methods*, Vijayawada,V.G.S Book links,2007.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	2	3	-	-	-	-	-	-	1	1	2	3
CO2	3	2	1	1	-	-	-	-	-	-	1	2	3	2
CO3	2	3	2	2	-	-	-	-	-	-	1	1	3	2

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Code:14AHS03	**3**	**1**	**-**	**3**

ENGINEERING CHEMISTRY

(Common to EEE,ECE,CSE & IT)

Outcomes:

After completion of the course students will be able to understand

1. Relate impact of hard water and its removal, formation of corrosion, effect of corrosion and designing of corrosionresistance articles.
2. Select suitable engineering materials for specific applications.
3. Select suitable fuels, calculation of air requirements for combustion of fuel, applications of different batteries and fuel cells.

UNIT – I: WATER TECHNOLOGY

Hardness of Water and its unit of expression – Estimation of hardness in water by EDTA titration method – Numerical problems – Effect of different water impurities (Hardness, Dissolved Oxygen and Chlorides) on boiler troubles – Water softening methods – zeolite process – Ion Exchange process – Demineralization of Brakish Water – Electrodialysis and Reverse Osmosis.

UNIT – II: CHEMISTRY OF CORROSION

Dry and Wet corrosion – causes of corrosion – mechanism of corrosion – Galvanic series – Galvanic and Concentration cell corrosion – Factors influencing the corrosion – Control of corrosion – Cathodic protection – Sacrificial anodic and Impressed current cathodic protection – Electro Plating and Electroless plating (Copper and Nickel).

UNIT – III: MATERIALS CHEMISTRY

Organic (High Polymers & Lubricants)

Plastics: Thermosetting and thermoplastics – Engineering applications and properties of PE, PTFE, PVC, Nylon and Bakelite.

Rubbers: Processing of Natural Rubbers – Vulcanization – Compounding of Rubber – Synthetic Rubber – Buna S, Buna N, Silicone rubber properties and applications.

Lubricants: Definition – Function of Lubricants – Classification of Lubricants – Properties of Lubricants (Viscosity Index – Flash and Fire point – Cloud and Pour point – Aniline point – Neutralization number – Mechanical strength).

Inorganic (Refractories & Cement)

Refractories: Definition – Classification – Important properties of refractories (Refractoriness, RUL, Thermal stability, Porosity, Dimensional stability and Mechanical strength).

Cement: Definition – Composition – Classification of cements – Setting and Hardening of cement.

UNIT – IV: FUELS AND COMBUSTION

Fuels: Classification of Solid, Liquid and Gaseous fuels – Calorific value – HCV, LCV. Measurement of calorific value using Bomb calorimeter and Junkers gas calorimeter – Numerical problems – Fuel rating system – Octane and Cetane numbers and their influence on I.C. Engines.

Combustion: Combustion products and calculation of air requirement (numerical problems) – Flue gas analysis by Orsat's apparatus.

UNIT – V: ELECTROCHEMICAL CELLS

Electrochemical Cells – Standard electrode potential – Working principles and applications of different batteries – Dry cell, Lithium-ion cell, Lead-acid cell and Nickel-cadmium cell. Recharging of Batteries –Battery rating (A-h rating) – Working principles and applications of hydrogen-oxygen and methanol-oxygen fuel cells – Principle of solar cells.

Text Books:

1. Prof. K.N.Jayaveera, Dr.G.V.Subba Reddy and Dr.C. Ramachandraiah, *Chemistry for Engineers* ,McGraw HillHigher Education Hyd., 3rd edition, 2009.
2. S.S. Dara and S.S. Umare ,*A text book of Engineering Chemistry*: S. Chand & Co. Ltd., 12th edition, 2010.
3. Jain & Jain, *A text book of Engineering Chemistry:* Dhanpat Rai Publishing Company, 15th edition, New Delhi,2008.

Reference Books:

1. Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra ,*Engineering Chemistry*: ScitechPublications(India) Pvt. Limted, Hyderabad, 2009.
2. C.V. Agarwal, C. Parameswara Murthy and Andra Naidu ,*Chemistry of Engineering Materials*: BS
3. Publications, Hyderabad, 9th edition, 2006.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	1	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	3	-	-	-	-	-	-	-	-	-	-	1	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

	L	T	P	C
I B.Tech II Semester				
Code:14AHS07	**-**	**-**	**3**	**2**

TECHNICAL ENGLISH LAB-I

(Common to EEE,ECE,CSE & IT)

Outcomes:

After completion of the course the student will be able to

1. Recognize English sounds- Monophthongs, diphthongs and consonant sounds.
2. Use correct pronunciation in English.
3. Distinguish between Received Pronunciation and Indian variety.
4. Use English with correct stress and intonation patterns because English is arhythmic language.

SYLLABUS:

The following course content is prescribed for the **English Language Laboratory** sessions.

UNIT-I Organs of speech, speech mechanism, vowels, consonants, diphthongs, syllable division, word stress, intonation, phonetic transcription with support of speech solutions, dictionary practice with AHD & CALD software.

UNIT-II Speaking of past, present & Future, Role play-Graded exercise with support of exercises from English Mastery, TOEFL Mastery & CALD Software.

UNIT-III **FUNCTIONAL ENGLISH-I**

Situational conversation-Grader exercises with support of Rosetta Stone Software

UNIT-IV **FUNCTIONAL ENGLISH-II**

Situational conversation-Grader exercises with support of Rosetta Stone Software

- Greeting/Self-introduction
- Expressing the cause of something
- Describe a current situation
- Speaking traditions/customs/public issues
- Making plans for vacation
- Expressing of emotions
- Shopping –bargaining price and making purchases
- Making an appointment

- Naming foods and describing tastes
- Reporting other person's messages
- Requesting
- Asking for directions and describing
- Making suggestions, agreements and refusals

UNIT-V GROUP DISCUSSIONS:

Do's and Don'ts of a G.D, Speaking on Knowledge based, controversial or abstract topics.

Reference Books:

1. English Language lab manual prepared by the Department of English
2. T. Balasubramaniyam, *A Text Book of English Phonetics for Indian students*, Macmillan Ltd., 2000.
3. Sasikumar.V and P.V. Dhamija,. *Spoken English: A Self-Learning Guide to Conversation Practice. 34thReprint.* Tata MCGraw Hill. New Delhi,1993.
4. Daniel Jones ,*English Pronouncing Dictionary*, Current Edition with CD.
5. R.K. Bansal and J.B. Harrison, Orient Longman, *Spoken English*, 2006 Edn.
6. Krishna Mohan & NP Singh (Macmillan), *Speaking English Effectively*
7. J. Sethi, Kamlesh Sadan and & D.V. Jindal, *A Practical course in English Pronunciation, (with twoAudio cassettes)* Prentice- Hall of India Pvt.Ltd., New Delhi.
8. English Dictionary For Advanced Learners, (with CD) international edn. Macmillan 2009.
9. E. Suresh Kumar, P. Sreehari, *A Handbook for English Language Laboratories, Foundation Books,* 2009.
10. Delta's Key to the Next Generation TOEFL Test, 6 audio CDs, New Age International Publishers, 2007.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	**2**	**-**	**-**	**-**	**2**	**2**	**-**	**-**	**-**	**-**	**2**	**1**	**2**	**3**
CO2	**-**	**3**	**-**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**3**
CO3	**-**	**3**	**-**	**2**	**-**	**3**	**-**	**-**	**3**	**-**	**-**	**-**	**2**	**3**
CO4	**-**	**-**	**2**	**-**	**-**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**3**	**-**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

	L	T	P	C
I B.Tech II Semester				
Code:14AHS08	**-**	**-**	**3**	**2**

ENGINEERING CHEMISTRY LAB

(Common to EEE,ECE,CSE & IT)

Outcomes:

After completion of practical's student will be able to

1. use volumetric analysis for the estimation of metal ions, hardness of water, dissolve oxygen in water, chlorides inwater, oxygen demand for water, alkalinity and acidity of water,
2. explain the importance of viscosity index, flash point and fire point of lubricants,
3. evaluation of eutectic temperature of binary system, and use of conductometer and potentiometer.

Any **TEN** of the following experiments

1. Estimation of Hardness of water by EDTA method.
2. Estimation of Dissolved Oxygen in Water.
3. Estimation of Chlorides in Water sample.
4. Determination of Chemical Oxygen Demand.
5. Determination of Acidity of Water sample.
6. Determination of Alkalinity of Water sample.
7. Estimation of Copper by EDTA method.
8. Estimation of Ferrous Ion by Potassium Dichromate method.
9. Determination of Flash and Fire point by using Pensky Marten's apparatus.
10. Determination of viscosity of oils through Redwood viscometer No.1.
11. Determination of viscosity of oils through Redwood viscometer No.2.
12. Determination of Eutectic temperature of Binary system (Urea-Benzoic acid).
13. Acid- Base titration by Conductometric method.
14. Redox titrations by Potentiometry.
15. Titration of Strong acid vs Strong base by Potentiometry.

Text Books:

1. Chemistry Pre-lab manual by Dr K. N. Jayaveera and K.B. Chandra Sekhar, S.M. Enterprizes Ltd.,2007.
2. Vogel's Textbook of Quantitative Inorganic Analysis, ELBS Edition, 1994.

Equipment Required:

1. Glassware: Burettes, Pipettes, Standard Flasks, Beakers, Measuring jars, BOD bottles and Reagentbottles.
2. Analytical balance,
3. Reflux Condensers,
4. Pensky Marten's apparatus,
5. Redwood viscometer,
6. Bomb calorimeter,
7. Conductometer, Potentiometer.

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

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester CE

L	T	P	C
3	1	0	3

14AHS10 PROBABILITY AND STASTISTICS

Expected Outcomes: After Completion of the course student will be able to

1. Sample the data and analyse it.
2. Optimize a function with two or more variables.
3. Apply suitable tests and evaluate the acceptance of the hypothesis.
4. apply different estimations and hypothesis to solve the problems

UNIT-I

PROBABILITY AND RANDOM VARIABLES: Sample space and events – Probability - The axioms of probability – Addition theorem of Probability – Conditional probability – Baye's theorem. Discrete and Continuous random variables – Mean and Variance.

UNIT-II

DISTRIBUTIONS AND SAMPLING THEORY: Distribution Functions – Binomial, Poisson and Normal Distributions.

SAMPLING DISTRIBUTIONS Populations and Samples – Sampling distributions of mean.

UNIT-III

ESTIMATION & TESTING OF HYPOTHESIS: Populations and Samples – Point Estimation – Interval estimation – Bayesian estimation.Type I error and Type II errors, One tail, two tail tests - Hypothesis concerning one and two means Hypothesis concerning one and two proportions.

UNIT-IV

TESTING OF SIGNIFICANCE (SMALL SAMPLES)

Student- t-test, F-test, Chi-square **[χ^2]** test**:** χ^2 **test** goodness of fit – the analysis of RxC tables, ANOVA – I way and II way classification.

UNIT-V

QUALITY CONTROL & QUEUEING THEORY: Introduction to Quality Control, Construction of $\bar{X}$, Range chart, C - chart and P charts. Pure Birth and Death process- M/M/1 Model – Problems on M/M/1 Model.

Text Books:

1. Iyengar. T.K.V., Krishna Gandhi B., Probability & Statistics, 2012,S.Chand & Company, New Delhi.
2. S.C. Gupta and Kapoor, A text book of Probability and Statistics, 2014, Sultan Chand Publications, New Delhi.

Reference Books:

1. Miller and John Freund. E., Probability & Statistics for Engineers, Eighth Edition, 2010, Pearson Education, New Delhi.

2. J.L. Devore, Probability & Statistics for engineering and sciences, 8th Edition, 2011, Ceneage Learning.
3. R.E. Walpole, R.H. Mayers, S.L. Mayers and K. Ye, Probability and Statistics for engineering and scientists, 8th Edition, 2006, Pearson Education.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO2	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO3	2	1	--	2	--	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--			--	--	--	--	--	2	--	--

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester CE

L	T	P	C
3	1	0	3

14ACE06 STRENGTH OF MATERIALS –II

Expected Outcomes: After Completion of the course the student will be able to

1. Calculate principal stresses and strains for axial loading, Inclined plane for biaxial stresses.
2. Analyse the close and open coiled helical springs and torsion of circular shafts.
3. Understand the principle of thin and thick cylinders and apply the same for unsymmetrical bending problems.
4. Analyse the curved beams.

UNIT I

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

THEORIES OF FAILURES: Various Theories of failures like Maximum Principal stress theory –Maximum Principal Strain theory – Maximum shear stress theory – Maximum strain energy theory –Maximum shear strain energy theory.

UNIT II

THIN CYLINDERS & THICK CYLINDERS: Thin seamless cylindrical shells – Derivation of formula for longitudinal and circumferential stresses – hoop, longitudinal and volumetric strains – Changes in dia. and volume of thin cylinders – Thin spherical shells. 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.

UNIT III

TORSION OF CIRCULAR SHAFTS – Theory of pure torsion – Derivation of Torsion equations: – Assumptions made in the theory of pure torsion – Torsional moment of resistance – Polar section modulus – Power transmitted by shafts – Combined bending and torsion and end thrust – Design of shafts according to theories of failure.

SPRINGS:

Introduction – Types of springs – deflection of close and open coiled helical springs under axial pull and axial couple –springs in series and parallel – Carriage or leaf springs.

UNIT IV

UNSYMETRICAL BENDING: Introduction – Centroidal principal 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 under unsymmetrical bending.

UNIT V

CURVED BEAMS: Introduction – circular beams loaded uniformly and supported on symmetrically placed Columns – Semicircular beam simply-supported on three equally spaced supports.

Text Books:

1.B.C Punmia, Ashok Kumar Jain & Arun Kumar Jain, SMTS –2, Theory of structures, twelfth edition 2005 Laxmi Publications.

2. S.S. Bhavikatti, Strength of Materials, Third edition 2009, Vikas publishers, New Delhi.

Reference Books:

1. Subramaniyan, Strength of Materials, Second Edition 2010 Oxford University Press, New Delhi.

2. L.S.Srinath et al., Strength of Materials, Macmillan India Ltd., New Delhi.

3. S.B.Junnarkar & Adavi, Mechanics of structures –1, Charotor Publications House, Anand, Gujrat

4. R.K.Bansal, A Text book of Strength of materials, Fourth edition 2010 Laxmi Publications (P) Ltd., New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO2	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO3	2	1	--	2	--	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--			--	--	--	--	--	2	--	--

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester CE

L	T	P	C
3	1	0	3

14ACE07 FLUID MECHANICS

Expected Outcomes: After Completion of the course student will be able to

1. Analyse fluid flow under static and dynamic conditions using fundamental principles.
2. Analyse the different types of flows, momentum applications.
3. Analyse the pipes flows and its losses and know the application of Moody's chart.
4. Understand working principles of different flow measuring devices and to analyse the boundary layer problems.

UNIT-I

Fluid Properties: Dimensions and units - Definition of a fluid – Physical properties of fluids- Density, Specific weight, Specific volume, Specific gravity, Compressibility, Vapour pressure, Surface tension and capillarity and Viscosity.

Fluid Statics: Pascal's law, Pressure variation in a static fluid – Atmospheric, gauge and absolute pressures, Measurement of pressure – Piezometer – U–tube and inverted U–tube manometers and Bourdon's pressure gauge, Hydrostatic forces on plane and curved surfaces, Center of pressure.

UNIT-II

Fluid Kinematics: Types of flow – Streamline – Streak line – Path line – Stream tube – Control volume and control surface – General control volume equation – Continuity equation in one and three dimensional forms – Stream function and velocity potential function – Flow net – Acceleration of a fluid particle – Local and convective accelerations – Tangential and normal accelerations.

Fluid Dynamics: Euler's equation of motion along a streamline – Bernoulli's energy equation – Energy correction factor – Impulse–momentum equation – Momentum correction factor – Force on a bend – Energy gradient line – Hydraulic gradient line – Analysis of free liquid jets – Forced vortex and free vortex .

UNIT-III

Laminar Flow: Reynolds' experiment – Regimes of flow - laminar flow, turbulent flow, transitional flow – Reynolds' number – Laminar flow through circular pipes – Hagen Poiseuille equation – Laminar flow through parallel plates, introduction of Hardy Cross method.

Boundary Layer Theory: Concept of Boundary Layer Flow- Boundary layer along a thin flat plate. Boundary layer Separation and its Control, Flow around submerged objects-Drag and lift.

UNIT-IV

Analysis of pipe Flow: Forces acting on open pipe and buried pipe, Minor losses in pipe flow – Pipes in series and parallel – Siphon – Pipe networks –Velocity distribution for turbulent flow in pipes – Rough and smooth pipes – Darcy–Weisbach equation – Variation of friction Factor – Moody's chart.

UNIT-V

Flow Measurement: Velocity measurement by Pitot tube and Pitot static tube – Discharge measurement by Venturimeter and orifice meter – Orifices and mouthpieces – Flow over Rectangular, Triangular and Trapezoidal and Stepped Notches and Broad Crested Weirs.

TEXT BOOKS:

1. P.N. Modi & S.M. Seth, Hydraulics and Fluid Mechanics including Hydraulic Machines, Twentieth Edition 2015, Standard Book House, New Delhi.
2. Richardson, Fluid Mechanics, First Edition, 1989, Taylor and Francis Publications

REFERENCES:

1. Streeter & Wylie, Fluid Mechanics, Mc Graw Hills Publications.
2. C.M. White, Fluid Mechanics, Mc Graw Hills Publications.
3. Fluid Mechanics and Fluid Power Engineering : Dr R.S.Kumar , S. Chand Publications
4. D.S. Kumar, Fluid Mechanics and Fluid Power Engineering, Katson Publishing House, Delhi.2004
5. R.K.Bansal, A Text Book of Fluid Mechanics and Hydraulic machinery, Ninth Edition 2003 Laxmi Publications (P) Ltd.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	--	--	--	--	--	--	--	--	--	--	2	--	--
CO2	3	-	--	--	--	--	--	--	--	--	--	--	2	--	--
CO3	2	1	--	--	--	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--			--	1	1	--	--	2	--	--

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

	L	T	P	C
II B.Tech-I Semester CE	**3**	**1**	**-**	**3**

14ACE08 **SURVEYING**

Expected Outcomes: After Completion of the course student will be able to

1. Apply the basic principles of surveying and usage of surveying instruments in all civil engineering activities, including the construction of buildings, bridges, roads and high ways, pipe lines, dams, ports and harbours
2. Prepare demarcation of ownership and / or delimitation of land, property, etc through surveying process.
3. Interpret data for planning, designing and execution, able to employ green field.
4. Use total station and able to assess the electromagnetic distances.

UNIT-I

INTRODUCTION: Principle of Surveying. Different types of Surveys (chain, Tape, compass and plane table).

ANGLES, AZIMUTHS AND BEARINGS: Units of angle measurement. Meridians, Azimuths bearings. Magnetic declination, Local attraction and corrections to angles and bearing of lines.

LEVELLING AND CONTOURING: Concept and Terminology, Temporary adjustments for a dumpy level. Determinations of Reduced Levels by Height of Instrument (HI) and Rise and Fall Methods. Characteristics and Uses of contours-Methods of conducting contour surveys.

UNIT-II

COMPUTATION OF AREAS AND VOLUMES: computation of areas and volumes for regular and irregular boundaries (Mid ordinate rules, Trapezoidal rule, Simpson's one-third rule). Determination of the capacity of reservoir, volume of barrow pits. Errors-accidental, probable, error of closure, relative, error due to incorrect ranging.

UNIT-III

THEODOLITE: Theodolite, description, uses and temporary adjustments Measurement of horizontal and vertical angles. Principles of Electronic Theodolite. Sources of error in theodolite work (Instrumental, Personal, and Natural).

CURVES: Types of curves, design and setting out-simple and compound curves. Setting out works

UNIT-IV

TOTAL STATION: Introduction to total station. Advantages and disadvantages, types, measuring angles. Electronic distance measurements.

UINT-V

GLOBAL POSITIONING SYSTEM (GPS): Principles and operation. Coordinate systems for GPS. Fundamental of GPS positioning Errors in GPS observations.

REMOTE SENSING: Principles of Remote sensing, different types of satellites, Simple Image Processor, Digital Index number (DIN), Digital Elevation model (DEM)

TEXT BOOKS:

1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain, Surveying (Vol-1, 2 &3), sixteenth 2005, Laxmi Publications (P) Ltd., New Delhi.
2. R.Subramanian, Surveying and leveling, Second Edition, 2005, Oxford university press, New Delhi.

REFERENCES:

1. Chandra AM, Plane Surveying, New age International PVT. Ltd., Publishers, New Delhi, 2002.
2. Chandra AM, Higher Surveying, New age International PVT. Ltd., Publishers, New Delhi, 2002.
3. C.Venkatramaiah, Text book of surveying, First Edition, 1996, Universities Press, New Delhi.
4. Duggal S.K., Surveying (Vol-1&2), Tata MC.Graw Hill Publishing Co. Ltd. Fourth Edition 2005, New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
CO1	3		--	--	--	--	--	--	--	--	--	--	2	2	--
CO2	3	3	--	--	--	--	--	--	--	--	--	--	2	2	--
CO3	3	3	--	--	2	--	--	--	--	--	--	--	2	2	--
CO4	3	3	--	3	2			--	3	3	--	2	2	2	--

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester CE

L	T	P	C
3	1	0	3

14ACE09 BUILDING MATERIALS AND CONSTRUCTION

Expected Outcomes: After Completion of the course student will be able to

1. Describe relevant physical and mechanical properties pertaining to the construction industry.
2. Demonstrate the relevant BIS testing procedure to be carried out to ascertain the quality of building materials.
3. develop ability to choose the modern construction material appropriate to the climate and functional aspects of the buildings and know about the causes of deterioration, crack pattern and damages.
4. Develop construction technique to be followed in brick, stone and hollow block masonry, Concreting, flooring, roofing, plastering and painting etc.

UNIT I

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

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

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

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

UNIT II

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

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

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

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

Modern Materials of construction: Galvanized iron, Fiber-reinforced plastics, steel aluminum, Properties and uses of iron, aluminum, glass, plastic, rubber, gypsum.

UNIT III

BUILDING COMPONENTS: Foundation, Sub and Super structure, roofing, doors and windows and flooring.

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

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

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

STAIRS: Terminology – Types of stairs.

UNIT IV

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

BUILDING SERVICES:

VENTILATION: Necessity – Functional requirements – Natural and mechanical ventilation.

LIGHTING: Day and artificial lighting – Types of lighting in working places.

FIRE PROTECTION: Causes – Fire load – General fire safety requirements – Fire resistant construction, rain water harvesting for buildings.

GREEN BUILDING: Outlines of Green Building Concept.

UNIT V

REPAIR AND REHABILITATION OF BUILDINGS:

Introduction- Need for rehabilitation- Types of damages-Effects of damages-Rehabilitation methods (Grouting)-Methods of Repair (Shortcreting, epoxy-cement mortar injection).

Text Books:

1. S.C.Rangwala , K.S. Rangwala and P.S. Rangwala, Engineering materials, 41st Edition: 2014, charotar Publishers, Anand.
2. Dr. B.C, Punmia, Building construction, Tenth Edition, 2012, Laxmi Publications (P) Ltd., New Delhi.

Reference Books:

1. S.K. Duggal, Building materials, Fourth Edition, 2012, New Age international(P)Ltd., New Delhi.
2. N.L.Arora and B.L. Gupta, Building construction, 2014 Edition, Satya prakshan publications, New Delhi.
3. Bureau of Indian Standards, National Building Code of India-2005, New Delhi.
4. R.N.Raikar , Diagnosis and treatment of structures in distress, Published by R&D Centre of Structural Designers & Consultants Pvt.Ltd., Mumbai, 1994.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
CO1	3	--	--	--	--	--	--	--	--	--	--	--	3	2	--
CO2	3	--	--	--	--	--	--	--	--	--	--	--	2	2	--
CO3	3	--	--	--	--	--	--	--	--	--	--	--	3	1	--
CO4	3	--	--	--	--	2	2	--	--	--	--	--	2	2	--

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L	T	P	C
2	0	3	3

II B.Tech – I Semester CE

14ACE10 BUILDING PLANNING AND COMPUTER AIDED DRAFTING OF BUILDINGS

Expected Outcomes: After Completion of the course student will be able to

1. Interpret the regulations for layout planning and preparation of drawings.
2 Design building drawings for residential building and hospital buildings.
3 develop scheduling and network planning of a construction project.
4 Illustrate the symbols and plan of a residential building using Auto Cad Software.

PART-A

UNIT – I

Principles of Building Planning: Introduction – Selection of Site – Orientation, location of buildings, thermal comfort, roominess, grouping, circulation, privacy, sanitation, elegance, economy, flexibility and practical considerations, Eco system concept.

UNIT – II

Building Bye–laws and Regulations: Introduction-Objectives of building bye-laws-Principles underlying building bye laws-Terminology – Floor area ratio (FAR), Floor space index (FSI)-Classification of buildings-Open space requirements- Built up area limitations-Height of the buildings-Wall thickness-Lighting and ventilation requirements.

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

UNIT – III

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

PART-B

UNIT – IV

DRAWING EXERCISES (Hands on Exercises):

1 a) Conventional signs used in building drawing
b) Doors, windows and ventilator
2 Single storied residential building with RCC Roof (Copying Exercise)
3 Drawing plan, elevation and section of a single storied residential building for the given line sketch and specifications
4 Multi–storied residential building with RCC roof
5 Drawing plan, elevation and section of an industrial building for the given line sketch and specifications
6 Planning and drawing of plan, elevation and section of a single storied residential building with RCC roof for the given site and accommodation details

Note: Subject to the availability of classes, there shall be 10 (Ten) drawing classes of two periods each.

LIST OF EXPERIMENTS:

1) Introduction to CAD (Computer Aided Drafting).
2) General commands and their practices.
3) Software for CAD and Introduction to different software's.
4) Practice exercise on CAD software. (Not to Scale figure).
5) Draw a plan to single storeyed building (1BHK, 2BHK, 3BHK).
6) Draw a plan for multi storeyed building (1BHK, 2BHK, 3BHK).
7) Development of sections and elevations for single and multi storeyed buildings.
8) Development components of buildings

I. Doors. II. Windows. III. Trusses.

FINAL EXAMINATION PATTERN:

The end examination paper shall consist of **Part A** and **Part B**. Part A consists of three questions (from the syllabus of the Units I, II, & III), out of which two questions are to be answered. Each question carries 15 marks. Part B consists of compulsory question with internal choice (from the syllabus of Unit IV) for 40 marks.

FOR INTERNAL ASSESSMENT:

Out of the total sessional marks of 30 allotted for this subject, 20 marks are to be awarded based on the performance in the two sessional examinations, 10 marks are to be awarded based on the day to day work of submission of drawing sheets.

Text Books:

1. Gurucharan Singh and Jagadish Singh, Planning and Designing and Scheduling, 2014, Standard publishers, New Delhi.
2. Kumaraswamy N., Kameswara Rao A., Building planning & Drawing, Seventh Edition, 2013, Charotar Publishing. New Delhi.

Reference:

1. Building by laws by state and Central Governments and Municipal corporations.
2. Shah.M.G., Building drawing, 2002, Tata McGraw-Hill, 1992.
3. S.C.Rangwala, Civil Engineering Drawing, Second Edition, 1991, Charotar Pulbishing House., New Delhi.
4. Dr.B.C.Punmia & Khandelwal, PERT and CPM, Fourth Edition, 2002, Project planning and control, Laxmi Publications.
5. Bureau of Indian Standards, National Building Code of India, New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3				2	2							3		
CO2	3				3								3		
CO3	3				2	2							3		
CO4	3				2								3		

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14ACE13 CIVIL ENGINEERING MATERIAL TESTING LABORATORY

Expected Outcomes: After completion of the course the student will be able to

1. Estimate Young's modulus, tensional rigidity of mild steel rods.
2. Calculate the hardness of mild steel and HYSD specimens.
3. Analyze the strength of wood, concrete, stone and bricks.
4. Evaluate the quality of wood, concrete, stone and bricks

List of Experiments

1. Study the stress–strain characteristics of mild steel rod using universal testing machine.
2. Determination of compressive strength of wood and concrete cube using compressive testing machine.
3. Determination of direct shear strength of rod using compressive testing machine.
4. Estimation of the modulus of elasticity of given material by measuring deflection in beams
    a. Simply supported beam.
    b. Over hanging beam.
5. Determination of the modulus of rigidity of given material using torsion testing machine.
6. Determination of the modulus of rigidity of given material using spring testing machine.
7. Determination of Brinnell's hardness & Rock well hardness numbers of given material.
8. Determination of impact strength (Izod and Charpy) using impact testing machine.
9. Determination of the compressive strength of a stone sample.
10. Test on bricks – Water absorption, Efflorescence, Compressive strength.

CO PO MAPPING															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**
CO2	**3**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**
CO3	**3**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**
CO4	**3**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**1**	**-**

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II B.TECH-I Semester CE

14ACE14 **SURVEYING LABORATORY**

Expected outcomes: After completion of the course the student will be able to

1. Apply various survey instruments for computation of area of a land.
2. Conduct survey work in all civil engineering projects, including the construction of buildings, roads and highways, rail track laying with curves, pipe lines, dams, ports and harbor as well as delimitation of land and property, etc.
3. Estimate accurate measurements of horizontal and vertical angles by theodolite and total station.
4. Develop computing the horizontal as well as vertical distance using tangential tachometry and expertise in handling of dumphy level, theodolite and total station for developing contour maps and longer sightetion of objective distance and difference in elevation.

EXERCISE – 1

Chain and tape Survey for plotting a land and its area computation.

Plane table Survey for plotting of a land and its area computation.

Study of Prismatic Compass and determination of distance between two inaccessible points by the compass and plain table survey.

Determination of the distance between inaccessible points by intersection method of plane tabling.

EXERCISE – 2

Study of dumpy level and its determination of difference in elevation between two points by height of collimation and rise fall and methods

EXERCISE – 3

Study of transit theodolite and Measurement of horizontal and vertical angles by Repetition method.

EXERCISE – 4

Measurements of distances difference in elevation between two objects and their heights using theodolites.

EXERCISE – 5

To set out simple curve using linear measurements methods – (Perpendicular offsets from long chord) and rankine's deflection angle method.

EXERCISE – 6

Study of total station instrument and Demonstration of Total Station Instrument to determine height of remote object, horizontal distance and co-ordinates of points using Total Station Instrument.

EXERCISE – 7

GPS Receiver (Using GPS- measure the building site, and set curves) Overview of GPS.

EXERCISE – 8

Field Work – one week (survey) camp compulsory.

CO PO MAPPING															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO2	**3**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO3	**3**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO4	**3**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**

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II B.Tech – II Semester CE

L	T	P	C
3	1	0	3

14AEE14 BASIC ELECTRICAL ENGINEERING & MECHANICAL ENGINEERING

PART - A

BASIC ELECTRICAL ENGINEERING

Expected Outcomes: After completion of the course the student will be able to

1. Understand the fundamentals of electrical circuits.
2. Apply the concept of all types of Electrical Machines like DC, AC, machines and Transformer.
3. Demonstrate the principle of measuring instruments.

UNIT I

ELECTRIC CIRCUITS: Basic definitions, Types of elements, Ohm's Law-, Resistive networks, Kirchhoff's Law, Inductive networks, Capacitive networks, Series, Parallel circuits and Star-delta and delta-star transformations.

UNIT II

DC MACHINES: Principle of Operation of DC Generator - EMF equation – types – DC motor types – torque equation – applications- three point starter.

AC MACHINES: Principle of Operation of alternators-regulation by synchronous impedance method – principle of operation of induction motor-slip-torque characteristics-applications.

UNIT III

TRANSFORMERS: Principle of operation of single phase transformers – EMF equation-losses-efficiency and regulation.

INSTRUMENTS: Basic Principle of indicating instruments-permanent magnet moving coil and moving iron instruments.

Text Books:

1. HUGHES, Electrical and Electronic Technology, Tenth Edition, 2010 - Pearson Publications., New Delhi.
2. B.L.Theraja: Electrical Technology, Volume: II, 23rd Edition 2008, S. CHAND Publications.

Reference Books:

1. J.P. Nagrath& D. P Kothari: Basic Electrical Engineering — PHI Publications
2. A.S Morris: Principles of measurements and instrumentation: Pearson.

PART - B

BASIC MECHANICAL ENGINEERING

Expected Outcomes: After completion of the course the student will be able to

1. Apply various welding equipment and various types of wildings used in the infrastructure construction.
2. apply basic working principles of I.C Engines and its applications
3. use various material handling equipment used in the civil construction works.
4. Demonstrate various earth moving equipments used in the civil construction works

Unit IV

WELDING: Classification of welding processes. Types of welds, welded joints, and their characteristics. welding fluxes and filler rods Gas welding, Arc welding, Forge welding, Resistance welding, Thermit welding, Plasma Arc welding, Inert Gas welding, TIG, MIG welding, and Friction welding, welding defects – causes and remedies. Introduction to Under water welding

Soldering & Brazing – Methods and types.

Cutting of Metals – Oxy Acetylene Gas cutting, plasma arc cutting, Cutting of ferrous and non-ferrous metals.

Unit V

Description and working of I.C. Engines – 4 stroke and 2 stroke engines – comparison and applications,

Reciprocating Air compressors – description and working of single stage and multi stage reciprocating air compressors – inter cooling, description and working of roots blower, vane blower, Centrifugal compressor, transmission of power; chain and gear drive-simple problems.

Earth moving machinery and mechanical handling equipments –hoist crane, Fork lift, bulldozer – power showels – Excavators (JCB) – concrete mixer – Belt and bucket conveyers - Lift and Escalators in buildings.

Text Books

1. S.B Mathur & S.Domkundwar, Elements of Mechanical Engineering, Dhanpat Rai &Co
2. O.P Khanna, Welding technology, Dhanpat Rai &Co.

NOTE: Three questions from **PART – A** and Two questions from **PART-B** may be set for final examination question paper.

CO PO MAPPING															
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
CO1	**3**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO2	**3**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO3	**3**	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**

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II B.Tech – II Semester CE

14ACE16 STRUCTURAL ANALYSIS - I

Expected Outcomes: After completion of the course the Students will be able to

1. Identify the method of analysis for indeterminate structures
2. explain the importance of the shape factor, deflection of beams
3. Analyze a member with moving loads.
4. Perform analysis for truss members.

UNIT I

FIXED BEAMS & CONTINUOUS BEAMS: Introduction to statically indeterminate beams with uniformly distributed load, central point load, eccentric point load, number of point loads, uniformly varying load, couple and combination of loads – Shear force and Bending moment diagrams –Deflection of fixed beams effect of sinking of support, effect of rotation of a support.

UNIT II

SLOPE-DEFLECTION & MOMENT DISTRIBUTION METHOD: Introduction, derivation of slope deflection equation, application to continuous beams with and without settlement of supports. Introduction to moment distribution method- application to continuous beams with and without settlement of supports.

UNIT III

ENERGY THEOREMS: Introduction-Strain energy in linear elastic system, expression of strain energy due to axial load, bending moment and shear forces – Castiglione's first theorem-Deflections of simple beams and pin jointed trusses.

UNIT IV

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

UNIT V

ANALYSIS OF INDETERMINATE STRUCTURES: Indeterminate Structural Analysis –
Determination of static and kinematic indeterminacies – Solution of trusses with up to two degrees of internal and external indeterminacies – Castiglione's theorem.

Text Books:

1. B.C. Punmia, A.K Jain & A.K.Jain, SMTS–2, Theory of Structures, Twelfth Edition, 2004,

Laxmi Publications.

2. C.S.Reddy, Basic Structural Analysis, Third Edition, 2010, TATA Mc. Graw Hill.

Reference Books:

1. Timoshenko & Young, Theory of Structures, TATA Mc. Graw Hill.
2. Wilbur and Norri's, Elementary Structural Analysis, TATA Mc. Graw Hill.
3. Vazirani & Ratwani, Analysis of Structures–Vol.II, Sixteenth Edition, 2015, Khanna Publishers.
4. Ramamrutham, Theory of Structures, Ninth Edition, 2014, DhapatRai Publications.
5. C.K.Wang, Intermediate Structural Analysis, , First Edition, 2010, Standard Publications

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
CO1	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO2	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO3	2	1	--	2	--	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--			--	--	--	--	--	2	--	--

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II B.Tech – II Semester CE

14AHS12 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to Civil, Mechanical & Automobile Engineering)

Expected Outcomes: After the completion of the course student will be able to

1. Understand concepts of managerial economics
2. Develop an understanding of economic principles and to enhance skills in high-level problem solving and critical thinking
3. Evaluate the economic environment and the impact of governmental economic policies on consumers and financial institutions.
4. Apply financial accounting in the field of Engineering.

UNIT – I

INTRODUCTION TO MANAGERIAL ECONOMICS

Managerial Economics: Definition, Nature and Scope – Demand analysis: Law of demand, Demand determinants, Elasticity of Demand: Definition, Types, Measurement and Significance – Demand forecasting methods (Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach)

UNIT – II

THEORY OF PRODUCTION AND COST ANALYSIS

Production function – Cobb Douglas Production function – Laws of Returns – Internal and External economies of scale **COST ANALYSIS:** Cost concepts, Fixed vs. Variable costs, Explicit vs. Implicit Costs, Out of Pocket costs Vs Imputed costs, Opportunity Cost and Sunk costs **BREAK EVEN ANALYSIS:** Concept of Break Even Point (BEP) – Break Even Chart – Assumptions underlying and Practical significance of BEP (Simple Problems).

UNIT – III

INTRODUCTION TO MARKETS AND BUSINESS ORGANIZATIONS:

Market structures – Types of Competition – Features of perfect competition, Monopoly, Monopolistic competition – Price-Output Determination under perfect competition and Monopoly – Types of Business organization – Features, Merits and demerits of Sole proprietorship, Partnership and Joint stock companies – Types of companies – Public enterprises –Types and Features – Changing business environment in post – Liberalization scenario.

UNIT – IV

CAPITAL AND CAPITAL BUDGETING:

Capital and its Significance – Types of capital – Estimation of fixed and working capital requirements – Methods and sources of raising capital – Capital Budgeting Methods**:** Payback Method, Accounting Rate of Return (ARR), and Net Present Value (NPV) Method (Simple Problems).

UNIT –V

FINANCIAL ACCOUNTING AND FINANCIAL ANALYSIS THROUGH RATIOS:

Double entry book keeping – Journal – Ledger – Trial Balance –Trading Account and balance sheet with simple adjustments **Ratio analysis:** Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt- Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Aryasri A. R., Managerial Economics and Financial Analysis, 4/E, TMH, 2009.
2. Varshney R.L. and K.L. Maheswari, Managerial Economics, Sultan Chand & Sons, 19/E, 2009.

REFERENCES:

1. Gupta R.L., Financial Accounting, Volume I, Sultan Chand & Sons, New Delhi, 2001
2. James C. Van Horne, Financial Management policy, 12/E, PHI, 2001.
3. Joel Dean, Managerial Economics, PHI, 2001.
4. Siddiqui S.A. and Siddiqui A.S., Managerial Economics and Financial Analysis, New Age international, 2009.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
CO1	3	--	--	--	2	--	--	--	--	--	--	2	2	--	--
CO2	3	--	--	--	2	--	--	--	--	--	--	2	2	--	--
CO3	2	--	--	--	1	--	--	--	--	--	--	2	2	--	--
CO4	2	--	--	--	1			--	--	--	--	2	2	--	--

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II B.Tech – II Semester CE

14ACE17 HYDROLOGY AND IRRIGATION ENGINEERING

Expected Outcomes: After completion of the course Students will be able to

1. Understand the concepts of duty and delta
2. Prepare and analyze the hydrographs, ground water resources
3. Understand the concepts of irrigation, types of soils and water requirement for crops.
4. Design Head works, canal outlets and canal lining and diversion head works.

UNIT I

HYDROLOGY: Engineering hydrology and its applications. Hydrologic cycle; precipitation-evaporation and transformation, infiltration and percolation and run-off, rainfall measurement, by different types of rain gauges, computation of average rainfall over a basin.

Measurement of evaporation and Infiltration- factors affecting infiltration, measurement of infiltration, infiltration indices; Run off- Factors affecting run- off, Computation of run-off; Design Flood; Estimation of maximum rate of run-off.

UNIT II

HYDROGRAPH ANALYSIS: Hydrograph- Unit Hydrograph- construction and limitations of Unit hydrograph, Application of the unit hydrograph to the construction of a flood hydrograph resulting from rainfall of unit duration; S-hydrograph, separation of base flow.

Rainfall and Run-off: Relations, flow mass curve, Intensity-duration-frequency relationship, Components of run-off. Factors influencing run-off. Rainfall and run-off relationships. Flow mass curve.

UNIT III

IRRIGATION: Necessity and Importance of Irrigation; advantages and ill effects of Irrigation; types of Irrigation; methods of application of Irrigation water; quality for Irrigation water. Duty and delta; duty at various places; relation between duty and delta; factors affecting duty; methods of improving duty.

soil fertility; Soil-water-plant relationship; vertical distribution of soil moisture; soil moisture tension; soil moisture stress; various soil moisture constants; Limiting soil moisture conditions; Depth and frequency of irrigation; Gross command area; Culturable command area; Culturable cultivated and uncultivated area; Irrigation efficiencies; Determination of irrigation requirements of crops; Assessment of Irrigation water. Consumptive use of water Evapotranspiration and computation of Irrigation crop water requirements.

UNIT IV

CHANNELS – SILT THEORIES: Classification; Canal alignment; Inundation canals; Cross–section of an irrigation channel; Balancing depth; Borrow pit; Spoil bank; Land width; Silt theories– Kennedy's theory, Kennedy's method of channel design; Drawbacks in Kennedy's theory; Lacey's regime theory- Lacey's theory applied to channel design; Defects in Lacey's theory; Comparison of Kennedy's and Lacey's theory.

WATER LOGGING AND CANAL LINING: Water logging; Effects of water logging; Causes of water logging; Remedial measures; Saline and alkaline soils and their reclamation; Losses in canal; Lining of irrigation channels – necessity, advantages and disadvantages; Types of lining; Design of lined canal.

UNIT V

DIVERSION HEADS WORKS: Types of diversion head works; Diversion and Storage head works; weirs and barrages; Layouts of diversion head works; components; Causes and failure of hydraulic structures on permeable foundations; Bligh's creep theory; Khoslas theory; Determination of uplift pressure, impervious floors using Bligh's and Khoslas theory; Exit gradient, Check dams.

CANALOUTLETS: Introduction; types of outlet; flexibility, proportionality, setting, hyper proportional outlet, sub-proportional outlet, sensitivity, efficiency of an outlet, drowning ratio, modular limit; pipe outlet; Kennedy's gauge outlet; Gibb's module; canal escape.

Text Books:

1. K.Subramanya, Engineering Hydrology, Fourth Edition, 2013, Tata Mcgraw Hill Company, Delhi
2. S. K. Garg, Irrigation Engineering and Hydraulic structures, First Edition, 2006, Khanna Publishers, Delhi.

Reference Books:

1. Punmia&Lal, Irrigation and water power engineering, Sixteenth Edition, 2009, Laxmi publications Pvt. Ltd., New Delhi
2. Srinivasan, Engineering Hydrology, Oxford Publishers, New Delhi
3. P.N.Modi, Irrigation Water Resources & Water Power Engineering, Seventh Edition, 2008, Standard Book House.
4. D.K. Majundar, Irrigation Water Management, Second Edition, Printice Hall of India.\
5. S. Jayarami Reddy, Engineering Hydrology, Laxmi publications, Third Edition, 2011, Pvt. Ltd., New Delhi

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PS O1	PS O2	PSO3
CO1	3	2	--	--	--	--	--	--	--	--	--	--	3	3	--
CO2	3	1	--	--	--	--	--	--	--	--	--	--	2	2	--
CO3	3	--	--	--	--	--	--	--	--	--	--	--	2	2	--
CO4	3	--	--	--	--	2	2	--	--	--	--	2	3	3	--

(AUTONOMOUS)

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II B.Tech – II Semester CE

14ACE18 HYDRAULICS & HYDRAULIC MACHINERY

Expected Outcomes: After completion of the course Students will be able to

1 Understand various types of flows, channels and velocity distribution.
2 describe concepts of jets and turbines.
3 Demonstrate the performance of different pumps.
4 Apply the concepts of dimensional analysis and hydropower engineering

UNIT I

OPEN CHANNEL FLOW-UNIFORM FLOW: Introduction, Classification of flows, Types of channels; Flow analysis: The Chezyequation, Empirical formulae for the Chezy constant, hydraulically efficient channel sections: Rectangular, Trapezoidal, Triangular and Circular channels; Velocity distribution; Energy and momentum correction factors. Application of Bernoulli's equation to open channel flow.

OPEN CHANNEL FLOW- NON – UNIFORM FLOW: Concept of specific energy; Specific energy curves; Critical flow; Critical flow in a rectangular channel; Critical slope; discharge curve, Different slope conditions; Channel transitions- Reduction in width of a rectangular channel, Raised bottom in a rectangular channel, venture flume, Momentum principle applied to open channel flow; Specific force; Specific force curve.

UNIT II

OPEN CHANNEL FLOW- GRADUALLY VARIED FLOW: Introduction, Dynamic equation;

Dynamic equation for GVF in wide Rectangular channel, classification of channel bottom slopes, Surface Profiles; Characteristics of surface profiles, Back water Curves and Draw down curves; Examples of various types of water surface profiles; Control section, Computation of surface profiles by single step method.

OPEN CHANNEL FLOW- RAPIDLY VARIED FLOW: Hydraulic jump; Elements and characteristics of hydraulic jump; Hydraulic jump in rectangular channels, height and length of the jump, Energy loss in a hydraulic jump, Types of hydraulic jump; applications of hydraulic jump; Location of hydraulic jump,.

UNIT III

IMPACT OF JETS: Hydrodynamic force of jets on stationary and moving flat inclined and curved vanes, jet striking centrally and at tip, velocity triangles at inlet and outlet, expressions formwork done and efficiency-Angular momentum principle, Torque and head transferred in roto dynamic machines.

UNIT IV

HYDRAULIC TURBINES-I: Introduction, head and efficiencies of hydraulic turbines,

Classification of turbines; pelton wheel: parts, Velocity triangles, work done and efficiency, working proportions, design of pelton wheel. Radial flow reaction turbines: velocity triangles and work done for inward radial flow turbine, degree of reaction, discharge, speed ratio, flow ratio.

HYDRAULIC TURBINES-II: Francis turbine: main components and working, work done and efficiencies, design proportions; design of Francis turbine runner. Kaplan turbine: main components and working, working proportions. Draft tube: theory and efficiency; specific speed, unit quantities, characteristic curves of hydraulic turbines. Cavitations: causes, effects.

UNIT V

CENTRIFUGAL PUMPS: Introduction, component parts and working of a centrifugal pump, work done by the impeller; heads, losses and efficiencies; minimum starting speed; Priming; specific speed; limitation of suction lift, net positive suction head(NPSH);Performance and characteristic curves; Cavitations effects ;Multistage centrifugal pumps; troubles and remedies.

Text Books:

1. P.N. Modi& S.M. Seth, Hydraulics and Fluid Mechanics including Hydraulic Machines, Twentieth Edition 2015, Standard Book House, New Delhi.
2. K.Subramanya, Flow in open channels, Third Edition , 2008.Tata McGraw Hill Publishing Co. Ltd, New Delhi

Reference Books:

1. VenTe Chow, Open channel Hydraulics, Tata McGraw Hill Publishing Co. Ltd, New Delhi.
2. RangaRaju, Elements of Open channel flow, Tata Mc.Graw Hill, Publications.
3. Rajput, Fluid mechanics, S.Chand&Co., New Delhi.
4. Dr. R.K. Bansal, A Text book of Fluid Mechanics and Hydraulic Machinery, Ninth Edition 2011, Laxmi Publications (P) Ltd.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	--	--	--	--	--	--	--	--	--	--	2	--	--
CO2	3	-	--	--	--	--	--	--	--	--	--	--	2	--	--
CO3	2	1	--	--	--	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--			--	1	1	--	--	2	--	--

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

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II B.Tech – II Semester CE

14ACE19 ENGINEERING GEOLOGY

Expected Outcomes: After completion of the course Students will be able to

1 Identify different types of Rocks and minerals
2 Apply the concepts of petrology.
3 Understand concepts structural geology, ground water and landslides.
4 Apply concepts of geology to dams and tunnels.

UNIT I

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

WEATHERING OF ROCKS: Causes of weathering of rocks, importance of weathering in construction of dams, reservoirs and tunnels.

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

UNIT II

PETROLOGY:

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

STRUCTURAL GEOLOGY:

Out crop, strike and dip study of common geological structures associating with the rocks such as folds, faults un conformities, and joints – their important types. Their importance Insitu and drift soils, common types of soils, their origin and occurrence in India

UNIT III

GROUND WATER, EARTH QUAKE &LAND SLIDES:

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

UNIT IV

GEOPHYSICAL STUDIES:

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

UNIT V

GEOLOGY OF DAMS, RESERVOIRS AND TUNNELS:

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

Text Books:

1. N.Chennkesavulu, Engineering Geology, Second Edition, 2013, Laxmi Publications.
2. Parbinsingh, Engineering geology, 2012, Katson Publications

Reference Books:

1. Vasudevkanthi, Engineering geology, First Edition, 2012, Universities press, Hyderabad.
2. Subinoy Gangopadhyay, Engineering Geology, 2012, Oxford University press.
3. K.V.G.K. Gokhale, Principals of Engineering Geology, First Edition, 2013, B.S publications
4. D.Venkata Reddy, Engineering Geology, First Edition, 2014, Vikas Publications, New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	--	3	--	--	--	--	--	--	--	--	3	1	3
CO2	3	3	--	2	--	--	--	--	--	--	--	--	3	3	3
CO3	3	2	1		--	2	--	--	--	--	--	--	3	3	1
CO4	3	3	--	1	--	--	--	--	--	--	--	--	2	1	1

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II B.Tech – II Semester CE

14ACE20 FLUID MECHANICS & HYDRAULIC MACHINERY LABORATORY

Expected Outcomes: After completion of the course Students will be able to

1. Calibrate Venturimeter & Orifice meter
2. Calculate losses in flows
3. Estimate the efficiency of different pumps.
4. Evaluate the performance of different turbines.

List of Experiments:

1. Verification of Bernoulli's equation
2. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
3. Calibration of Venturimeter & Orifice meter
4. Determination of Coefficient of discharge for a small orifice by a constant head method.
5. Determination of Coefficient of discharge for an external mouth piece by variable head method.
6. Calibration of contracted Rectangular Notch and /or Triangular Notch
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. Efficiency test on centrifugal pump.
12. Efficiency test on reciprocating pump.

TEXT BOOK/REFERENCE BOOK:

1. Dr.N.Kumara Swamy, Fluid Mechanics and Machinery Laboratory manual, First Edition, 2008, Charotar publishing House Pvt.Ltd., Anand.

CO PO MAPPING															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	-	-	3	-	-	-	3	-	-	-	2	2	-
CO2	1	2	-	-	3	-	-	-	3	-	-	-	2	2	-
CO3	1	2	-	-	3	-	-	-	3	-	-	-	2	2	-
CO4	1	2	-	-	3	-	-	-	3	-	-	-	2	2	-

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II B.Tech – II Semester CE

14ACE21 **ENGINEERING GEOLOGY LAB**

Expected Outcomes: After completion of the course Students will be able to

1 Identify different types of rocks and minerals.
2 Interpret properties of rocks and minerals
3 Apply concepts structural geology, ground water and landslides.
4 Conduct subsurface analysis in the field.

List of Experiments:

1. Introduction to Crystallography – Identification of Crystals.
2. Introduction of minerals and the study of Physical properties, Identification of Quartz and feldspars.
3. Identification of pyroxenes and Amphiboles and other silicates.
4. Identification of important economic minerals.
5. Identification of important ore deposits.
6. Identification of Igneous rocks.
7. Identification of Sedimentary rocks.
8. Identification of metamorphic rocks.
9. Structural geology- strike and dip, three and 3-point problems point problems.
10. Structural geology – Completion of out crops maps, order of superposition.
11. Subsurface analysis – Resistivity sounding.
12. Subsurface analysis – Seismic survey.

TEXT BOOK/REFERENCE BOOK:

1. Chennakesavulu. N., "Text book of Engineering Geology", Second Edition, 2013, Laxmi Publications., New Delhi, 2009.
2. Structural Geology Manual.

LAB EXAMINATION PATTERN:

1. Description and identification of SIX minerals
2. Description and identification of Six (including igneous, sedimentary and metamorphic rocks)
3. Interpretation of a Geological map along with a geological section.
4. Simple strike and Dip problems.

CO PO MAPPING															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	-	-	3	-	2	-	-	-	-	-	-	1	3	-
CO2	2	-	-	3	-	2	-	-	-	-	-	-	1	3	-
CO3	2	-	-	3	-	2	-	-	-	-	-	-	1	3	-
CO4	2	-	-	3	-	2	-	-	-	-	-	-	1	3	-

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II B.Tech II SEMESTER **L T P C**
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14AHS15 **Quantitative Aptitude and Reasoning -I**
(Common to all Branches)

Outcomes:

After completion of the course the student will be able to

1. Solve Time and distance problems.
2. Apply Data interpretation to solve the problems on Line, Bar, Pie graphs.
3. Develop the thinking ability and apply Venn diagram and binary logic.
4. Apply the number series and letter analogies in problems on verbal analogy.

Syllabus for Quantitative Aptitude

Competency 1:

1.1 Numbers

Classification of numbers - Divisibility rules - Finding the units digit - Finding remainders in divisions involving higher powers -LCM and HCF Models.

1.2 Decimal Fractions

1.3 Simplification

1.4 Square Roots & Cube Roots

1.5 **Average**

Definition of Average - Rules of Average - Problems on Average - Problems on Weighted Average - Finding Average using assumed mean method.

1.6 Problems on Numbers

1.7 Problems on Ages

1.8 Surds & Indices

1.9 Percentage

Introduction - Converting a percentage into decimals - Converting a Decimal into a percentage - Percentage equivalent of fractions - Problems on Percentages

1.10 **Profit And Loss & True Discount**

Problems on Profit and Loss percentage - Relation between Cost Price and Selling price - Discount and Marked Price –Two different articles sold at same Cost Price - Two different articles sold at same Selling Price - Gain% / Loss% on Selling.

1.11 **Ratio and proportion**

Definition of Ratio - Properties of Ratios - Comparison of Ratios - Problems on Ratios - Compound Ratio - Problems on Proportion, Mean proportional and Continued Proportion.

Competency 2:

2.1 **Partnership**

Introduction-Relation between capitals, Period of Investments and Shares .

2.2 **Chain Rule**

2.3 **Time & work**

Problems on Unitary method - Relation between Men, Days, Hours and Work - Problems on Man-Day-Hours method – Problems on alternate days - Problems on Pipes and Cisterns .

2.4 **Time & Distance**

Relation between speed, distance and time – Converting kmph into m/s and vice versa - Problems on average speed -Problems on relative speed – Problems on trains -Problems on boats and streams - Problems on circular tracks – Problems on races .

2.5 **Mixtures and Allegations**

Problems on mixtures - Allegation rule - Problems on Allegation

2.6 **Simple Interest**

Definitions - Problems on interest and amount – Problems when rate of interest and time period are numerically equal.

2.7 **Compound Interest**

Definition and formula for amount in compound interest - Difference between simple interest and compound interest for 2 years on the same principle and time period.

2.8 **Logarithms**

Syllabus For Reasoning

Competency 3:

3.1 Cubes

Basics of a cube - Formulae for finding volume and surface area of a cube - Finding the minimum number of cuts when the number of identical pieces are given - Finding the maximum number of pieces when cuts are given - Problems on painted cubes of same and different colors - Problems on cuboids - Problems on painted cuboids - Problems on diagonal cuts

3.2 Venn diagrams

Representing the given data in the form of a Venn diagram –Problems on Venn diagrams with two sets - Problems on Venn diagrams with three sets – Problems on Venn diagrams with four sets

3.3 Binary Logic

Definition of a truth-teller - Definition of a liar - Definition of an alternator – Solving problems using method of assumptions - Solving analytical puzzles using binary logic .

Competency 4:

4.1 Number and letter series

Difference series - Product series - Squares series - Cubes series - Alternate series - Combination series - Miscellaneous series - Place values of letters.

4.2 **Number and Letter Analogies**

Definition of Analogy -Problems on number analogy -Problems on letter analogy - Problems on verbal analogy .

Odd man out

Problems on number Odd man out -Problems on letter Odd man out –
Problems on verbal Odd man out .

Competency 5:

5.1 Coding and decoding

Coding using same set of letters - Coding using different set of letters –
Coding into a number - Problems on R-model .

5.2 Direction sense

Solving problems by drawing the paths-Finding the net distance travelled –
Finding the direction - Problems on clocks - Problems on shadows - Problems on damaged compass - Problems on direction sense using symbols and notations

5.3 Critical Reasoning

Problems on assumption - Problems on conclusions –Problems on inferences –
Problems on strengthening and weakening of arguments - Problems on principle -Problems on paradox

5.4 Lateral reasoning puzzle

Problems on common balance -Problems on digital balance -Problems on coins -Problems on lockers -Problems on heights -Digit puzzles using basic arithmetic operations .

Text Books:

1. GL Barrons,Tata Mc Graw Hills, 'Thorpe's Verbal reasoning', LSAT Materials.2015.
2. R S Agarwal, 'A Modern approach to Logical reasoning' , S chand Company Ltd 2002.

Reference Books:

1. Abhjit Guha 'Quantitative Aptitude' Tata Mc Graw Hills, 4th Edition, 2011.
2. R S Agarwal, 'Quantitative Aptitude' S. Chand Company Ltd 2008.
3. G.L BARRONS 'Quantitative Aptitude'. Tata Mc Graw Hills,2014

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											2		
CO2	3	2											2		
CO3	2	1											1		
CO4	2	1											1		

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III – B.Tech. I Semester

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Code: 14AHS13 **TECHNICAL ENGLISH – II**

Preamble:

English is an international language as well as aliving and vibran tone. People have found that knowledge of English is a passport for better career and for communication with then tire world. As it is a language of opportunities in this global age, English is bound to expand its domain of use every where. The syllabus has been designed to enhance communication skills of the students of Engineering and Technology. The prescribed book serve the purpose of preparing them for everyday communication and to face global competitions in future.

The prescribed text focuses on LSRW skills and vocabulary development. The teachers should encourage the students to use the target language. The classes should be interactive and student-centered. They should be encourage to participate in the class room activities keenly.

Outcomes:

After completion of the course the students will be able to:

- Enrich their communication skills both in academic and social arena.
- Master LSRW skills.
- Become proficient in English language and make use of it to be good in his subject.
- Cultivate skills for societal service and inculcate passion for work.
- Understand the human values of life and work.

UNIT –I

Chapterentitled‘Humour’from“UsingEnglish”

Listening-Techniques-Importance of phonetics

L-Meet&GreetandLeavetaking,IntroducingOneselfandOthers(FormalandInformal situations)

R- ReadingStrategies-SkimmingandScanning

W-Writingstrategies-sentencestructures

G-Parts of Speech–Noun-number, pronoun-personal pronoun, verb-analysis

V-Affixes-prefixand suffix,rootwords,derivatives

UNIT–II

Chapter entitled ‘Inspiration ’from “Using English”

L-Listening to details

S- Apologizing,Interrupting,Requestingand Makingpoliteconversations

R- Notemakingstrategies

W-Paragraph-types-topicsentences,unity,coherence, length,linkingdevices

G-Auxiliaryverbsandquestiontags
V-synonyms-antonyms,homonyms,homophones,homographs,wordsoftenconfused

UNIT–III

Chapter entitled 'Sustainable Development 'from "Using English"

L-Listening to the me sand note taking

S-GivinginstructionsandDirections,makingsuggestions,Acceptingideas,fixingatimeand Advising

R- Readingfordetails-1

W-Resumeandcoverletter

G-Tenses–Presenttense, PasttenseandFuturetense

V-WordformationandOne-WordSubstitutes

UNIT–IV

Chapter entitled 'Relationships 'from "Using English"

L-Listening tone ws

S- Narratingstories,Expressingideasandopinionsandtelephoneskills

R- ReadingforspecificdetailsandInformation

W-TechnicalReportwriting-strategies,formats-types-technicalreportwriting

G-VoiceandSubject–VerbAgreement

V- IdiomsandprepositionalPhrases

UNIT–V

Chapter entitled 'Science and Humanism 'from "Using English"

L-Listening to speeches

S- MakingPresentationsandGroupDiscussions

R- Readingfor Information

W-E-maildrafting

G-Conditionalclausesandconjunctions

V-CollocationsandTechnicalVocabularyandusingwordsappropriately

Remedial Grammar:

1. Adjectives and Adverbs.
2. Use of Articles.
3. Review of prepositions and conjunctions.
4. Transformation of sentences
    (a) Active and Positive Voice.
    (b) Synthesis and analysis.
    (C) Direct and indirect speech.
5. Common errors in English.

Vocabulary:

1. Synonyms and antonyms.
2. One word substitutions.
3. Phrasal verbs and idioms.
4. Commonly confused words
5. Verbal ability.

Writing practice (composition):

1. Essay writing
2. Report writing
3. Resume writing
4. Creative writing
5. Letter writing

Question Paper pattern: **Max Marks: 70**

PART – I

From the prescribed text book without leaving any lesson

1. 2 marks questions – 5	(Any five out of eight)	5 x 2 = 10M
2. 8 marks questions – 2	(Any two out of four)	2 x 8 = 16M

PART – II

3. General essay – 1	(Any one out of three)	1 x 8 = 8.M
4. Report Writing – 1	(Any one out of two)	1 x 8 = 8.M
5. Resume Writing – 1	(No choice)	1 x 8 = 8.M
6. Idioms – 5	(Any five out of eight)	5 x 1 = 5.M
7. Vocabulary - 5	(Any five out of eight)	5 x 1 = 5.M
8. Correction of sentences - 10	(Any ten out of fifteen)	10 x1 = 10.M

Total = 70Marks

TextBook: " UsingEnglish; A Coursebook for Undergraduate Learners"
PublishedbyOrientBlackSwan, 2013.

ReferenceBooks:

1. RaymondMurphy'sEnglishGrammarwith CD, Murphy,CambridgeUniversityPress,2012.
2. EnglishConversationPractice–GrantTaylor,TataMcGrawHill,2009.
3. CommunicationSKILLS,SanjayKumar&PushpalathaOxfordUniversityyPress, 2012.
4. A Course in Communication Skills-Kiranmai Dutt& co.FoundationBooks, 2012.

MAPPPING OF COS WITH POs:

COURSE OUTCOMES	PROGRAMME OUTCOMES											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1		✓	✓	✓		✓	✓	✓	✓			
CO2		✓		✓			✓	✓	✓			✓
CO3		✓	✓	✓			✓	✓	✓			
CO4			✓	✓		✓	✓	✓	✓			
CO5			✓	✓		✓	✓	✓	✓			✓

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III B. Tech – I Semester CE

14ACE24 DESIGN & DRAWING OF REINFORCED CONCRETE STRUCTURES

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

1. Apply the basic concepts of limit state method of design for reinforced concrete structural elements such as beams, slabs, columns, footings and stairs (PO1).
2. Analyse the stability of structures for shear, torsion, deflection & development length to design using Limit State of Serviceability (PO2).
3. Design beams, columns, slabs, footings and stair case under limit state design method (PO3).
4. Plan the reinforcement of beams, columns, slabs, footings and staircase under Limit State design Method using both traditional and modern tools.(PO5).
5. Apply IS code to design of various structural elements using Limit state design.

UNIT I

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

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

UNIT II

Shear, Torsion and Bond**:** Limit state analysis and design of section for shear and torsion – concept ofbond, anchorage and development length, I.S. code provisions. Design examples in simply supportedand continuous beams, detailing, Limit state design for serviceability for deflection, cracking and codal provision.

UNIT III

Design of Two-way slabs, one way slab, continuous slab Using I S Coefficients, Cantilever slab/Canopy slab.

UNIT IV

Short and Long columns–axial loads, uni-axial and biaxial bending I S Code provisions.

UNIT V

Design of Footings - isolated (square, rectangular) and Combined footings.Design of Stair case – Dog legged and Open well.

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

Following plates should be prepared by the students.

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

FINAL EXAMINATION PATTERN:

The end examination paper should consist of Part A and Part B. Part A consist of two questions inDesign and Drawing out of which one question is to be answered. Part B should consist of fivequestions on design out of which three are to be answered. Weightage for Part – A is 40% and Part- Bis 60%.

Text Books:

1. B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Limit State Design,Laxmi, Publications Pvt. Ltd., New Delhi

2.S.Unnikrishna Pillai &Devdas Menon - Reinforced concrete design, Tata McGraw Hill, New Delhi.

Reference Books:

1. A. K.Jain- Limit State Design, Nemchand&Brothers, New Delhi, 7th edition.

2.P.C.Varghese - Limit state designed of reinforced concrete, Prentice Hall of India, New Delhi

3. N.C. Sinha and S.K Roy - Fundamentals of reinforced concrete, S. Chand publishers, New Delhi

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

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	--	--	--	--	3	--	--	--	--	3	2	--
CO2	3	3	3	--	--	--	--	3	--	--	--	--	3	2	--
CO3	3	2	--	--	--	--	--	1	--	--	--	--	2	2	--
CO4	3	2	--	--	3	--	--	--	--	--	--	--	3	2	--
CO5	3	3	--	--	--	--	--	--	--	--	--	--	3	2	--

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III B.Tech – I Semester CE

14ACE25 STRUCTURAL ANALYSIS -II

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

1. understand the arch action and types of arches and analyse the same.
2. apply the knowledge of mathematics(matrices) in analysing the structural elements such as continuous beams, portal frames by flexibility and stiffness methods.
3. work individually as well as in teams through project work
4. engage in life-long learning.
5. apply appropriate techniques and software for analysing the building system.

UNIT I

ARCHES : Three hinged arches, Elastic theory of arches – Eddy's theorem – Determination ofhorizontal thrust, bending moment, normal thrust and radial shear – effect of temperature-Determination of horizontal thrust bending moment, normal thrust and radial shear – Rib shorteningand temperature stresses, tied arches – fixed arches – (No analytical question).

UNIT II

SLOPE-DEFLECTION & MOMENT DISTRIBUTION METHOD:-Analysis of single bay, single storey, portal frame including side sway– Stiffness and carry over factors – Distribution factors– Analysis of single storey portal frames – including Sway - Substitute frame analysis by two cyclemethod.

UNIT III

KANI`S METHOD: Analysis of continuous beams – including settlement of supports and single bay, single storey portalframes with side sway by Kani's method.

UNI T IV

FLEXIBILITY & STIFFNESS METHODS:

Flexibility methods, Introduction, application to continuous beams including support settlements-Introduction to stiffness method and its application to continuous beams includingsupport settlements.

UNIT V

PLASTIC ANALYSIS:

Introduction – Idealized stress – Strain diagram – shape factors for various sections – Momentcurvature relationship – ultimate moment – Plastic hinge – lower and upper bound theorems –ultimate strength of fixed and continuous beams.

Text Books:

1. Bhavikatti- Analysis of Structures – Vol. I &2 ,Vikas publications
2. Vazrani&Ratwani - Analysis of structures– Khanna Publications.

Reference Books:

1. Devdasmenon - Structural analysis - 6th edition – Pearson publilcation.
2. Pundit and Gupta - Structural Analysis (Matrix Approach)– Tata Mc.Graw Hill publishers.
3. B.C. Punmia –Theory of Structures, Laxmi Publications, NewDelhi

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO2	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--
CO3	2	1	--	2	--	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--			--	--	--	--	--	2	--	--
CO5	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--

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3	1	3

III B.Tech – I Semester CE

14ACE26 WATER RESOURCES ENGINEERING

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

1. Analyse the suitability of different types and methods of irrigation for better water management.
2. Investigate the planning and management of single & multipurpose projects.
3. Formulate various methods for river engineering.
4. Apply principles of water resources in selecting suitable type of turbines for hydro-power plant
5. Design the hydraulic structures to suit various public health and safety and the cultural, societal and environmental considerations

UNIT I

CANAL REGULATION WORKS: Canal falls: Necessity and location of falls; Types of falls; classification of falls; cistern design; roughening devices; design of sarada type fall. Canal regulators :off-take alignment; head regulators and cross-regulators; design of cross-regulator and distributaryhead regulator.

CROSS DRAINAGE WORKS: Introduction; types of cross drainage works; selection of suitable

type of cross drainage work; classification of aqueducts and siphon aqueducts.

UNIT II

STREAM GAUGING: Necessity; Selection of gauging sites; methods ofDischargeMeasurementArea-Velocity method; Slope-Area method; Tracer method, Electromagneticinductionmethod,Ultrasonic method; Measurement of depth –Sounding rod, Echo-sounder;Measurementofvelocity: Floats – Surface floats, Sub–surface float or Double float, Velocity rod; Pitottube; Current meter- rating of current meter, measurement of velocity; chemical method;Measurementof stage-Staff gauge, wire gauge, water stage recorder, bubble gauge recorder; stagedischargecurve.

RIVER ENGINEERING: Classification of rivers; Meandering; Causes of meandering; Basic factorscontrolling process of meandering; Aggrading type of river; Degrading type of River; River training:objectives, Classification of river training works; Types of River training works : Guide banks,Marginal embankments,Groynes or spur, levees, bank protection, pitched islands.

UNIT III

RESERVOIR PLANNING: Introduction; Investigations for reservoir planning; Selection ofsiteforareservoir; Zones of storage in a reservoir; Storage capacity and yield; Mass inflow curve and demandcurve; Calculation of reservoir capacity for a specified yield from the mass inflow curve;Determination of safe yield from a reservoir of a given capacity; Sediment flow instreams: Reservoir sedimentation; Life of reservoir; Reservoir sediment control; Flood routing; Methods of flood routing-Graphical Method (Inflow – storage discharge curves method).

DAMS: GENERAL: Introduction; Classification according to use; classification according to material- Gravity dams, Arch dams, Buttress dams, Steel dams, Timber dams, Earth dams and rockfill dams-advantages and disadvantages; Physical factors governing selection of type of dam;selection of site for a dam.

UNIT IV

GRAVITY DAMS: Introduction; Forces acting on a gravity dam; Combination of loading for design;Modes of failure: stability requirements; principal and shear stresses; Stability analysis; Elementaryprofile of a gravity dam; Practical profile of a gravity dam; Limiting height of a gravity dam- Highand low gravity dams; Design of gravity dams–single step method; Galleries; Stability analysis ofnon–overflow section of Gravity dam.

EARTH DAMS: Introduction; Types of earth dams; Causes of failure of earth dams; Criteria for safedesign of earth dams; Section of an earth dam; Design to suit available materials; Seepage controlmeasures; Slope protection. Seepage through earth dam – graphical method

UNIT V

SPILLWAYS: Introduction; Types of spillways; Profile of ogee spillway; Energy dissipation below spillways for relative positions of jump height curve and tail water curve; Stilling basins;Indian standards on criteria for design of hydraulic jump type stilling basins with horizontalaprons; Spillway crest gates-Types and description only.

WATER POWER ENGINEERING: Development of hydro power in India; Classification of hydel

plants: runoff river plants, storage plants and pumped storage plants; low, medium and high headschemes ; Investigation and planning; components of hydel schemes – fore bay, intake structure,surge tanks, penstocks ,power house, turbines-selection of suitable type of turbine, Scroll casing .draft tube and tail race; assessment of available power; definition of gross head ,operating head ,effectivehead; Flow duration curve; Power duration curve; Load duration curve; Load curve ; primary powerand secondary power; installed capacity, dependable capacity; firm power, secondary power; powerfactor ;load factor, capacity factor ,utilization factor and Diversity factor.

Text Books:

1. Dr.P.N.Modi - Irrigation Water Resources and Water Power Engineering

2.Dr. B.C.Punmia&Dr.Pande B.B. Lal - Irrigation and Water Power Engineering; Laxmi Publications

Reference Books:

1. G.L. Asawa - Irrigation and water resources engineering , New Age International Publishers

2. S. K. Garg . - Irrigation Engineering and Hydraulic Structure; Khanna Publishers, New Delhi.

3.K R Arora - Irrigation, Waterpower and Water Resources Engineering ; Standard Publication,New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	--	--	--	--	--	--	--	--	--	--	3	3	--
CO2	3	1	--	--	--	--	--	--	--	--	--	--	2	2	--
CO3	3	--	1	--	--	--	--	--	--	--	--	--	2	2	--
CO4	3	--	--	--	--	2	2	--	--	--	--	2	3	3	--
CO5	3	--	1	--	--	--	--	--	--	--	--	--	--	--	--

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

	L	T	C
III B.Tech – I Semester CE	**3**	**1**	**3**

14ACE27 ENVIRONMENTAL ENGINEERING – I

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

1. Identify, formulate and analyze the sustainable source of water for public water supply system.
2. understand the concept water and its impact on human health, safety and demand.
3. design water treatment plant by application of mathematical and scientific principles.
4. Prepare reports, specifications, drawings either individually or a member in a team.
5. Apply specific treatment process for fluoride, arsenic iron and manganese and salts and disposal of sludge residues in the environment.

UNIT - I

INTRODUCTION: Need for potable water supply systems. Objectives of natural water treatment. Basic design consideration in major public water supply system – (Design period, estimation methods of future population, source selection, treatment process train, plant siting, layout and plant Hydraulics).

SOURCES OF WATER: Surface, ground and seawaters as a source of public water supply and their merits and demerits. Source selection and protection practices.

QUALITY OF WATER: Physical, chemical and biological impurities in water. Water borne diseases.MPN Index calculation by multiple-tube fermentation.Water quality standards for drinking purpose.

UNIT- II

DEMAND OF WATER: Estimation of per capita demand of water and variations of water demand. Factors

Influencing water demand. Design flows for design of various components of water supply scheme.

WATER COLLECTION: Purpose and considerations in the location of intake structure.Intake structures for river, canal, reservoir, lakes and ponds.Design of infiltration galleries and Radial-wells.

TRANSMISSION OF RAW WATER: Design of economical conveying main and pumping system. Accessories in conveying main.Design of pumping machinery.

UNIT - III

WATER TREATMENT PROCESSES: Unit operations and processes in conventional water supply schemes and their functions. General treatment process flow diagrams for different sources and quality of waters.

AERATION: Objectives of aeration of impounding waters. Design of cascade aeration system.

COAGULATION PROCESS: Objectives of coagulation of natural waters. Common coagulants of used in water treatment system and their reactions.Determination of optimum dose of alum for coagulation of natural surface water.Mechanism of coagulation process.Design of rapid mix and clari-flocculators.

UNIT- IV

FILTRATION: Theory of filtration. Different types of filters and their working and operational system. Basic differences between the slow and rapid sand filters.Design of slow and rapid sand filters.Head losses in filters.

DISINFECTION METHODS: Common disinfectants used in disinfection of water and their merits and demerits Available chlorine in different disinfectants. Mechanism of disinfection process .Determine of optimum dose of chlorine for raw and filtered water. Break Point Chlorination and its importance. Design of chlorine contact chambers.De-chlorination practices during epidemics.

UNIT-V

SPECIFIC TREATMENT METHODS: Specific treatment methods used for the removal of fluorides, arsenic, hardness, iron and manganese, colour and refractory organics. Desalination of seawater.

DISTRIBUTION SYSTEM: Different methods of water distribution systems. Layout of water distribution systems. Analysis of distribution networks – Hardycross and equivalent pipe methods. Computation of capacity of storage reservoirs.Valves and pipe joints used in water distribution system. Leak detection and prevention in water distribution net work.Water connection to the house from municipal water main.

SLUDGE HANDLING AND DISPOSAL: Sources of residuals and their characteristics in water treatment processes. Residual processing methods and disposal practices.

Text Books:

1. Punmia, B.C, Ashok Jain, and Arun Jain "Water supply Engineering" Arihant Publications, Bombay, (1995).

2. Santoshkumar Garg "Environmental Engineering (Vol.1). Water supply Engineering "Khanna Publishers, New Delhi, 1996.

Reference Books:

1. Syed R. Qasium"Water works Engineering" Prentice – Hall of India Pvt. Ltd., New Delhi, 2002.

2. Susumu Kawamura "Integrated Design and operation of water Treatment Facilities. Johan wiley and sons, Inc., New York, 2000.

3. Peavy, H.S., and D.R. Rowe "Environmental Engineering" MC – Graw Hill Publishing company, New York, 1984.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		--	--	2	2		--	--	--	--	3	2	--
CO2	3	3	3	--	--	2	2		--	--	--	--	3	2	--
CO3	3	2	--	--	--	1	1		--	--	--	--	2	2	--
CO4	3	2	--	--		2	2	--	3	3	--	1	3	2	--
CO5	2	--	--	--	--	2	2	--	--	--	--	--	2	--	--

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	L	T	C
III B.Tech – I Semester CE	**3**	**1**	**3**

14ACE28 GEOTECHNICAL ENGINEERING –I

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

1. Understand the engineering properties for solving geotechnical operations
2. Analyse and design seepage through earth dams.
3. Apply the knowledge of one-dimensional consolidation theory in computing settlements of structures
4. Evaluate the factor of safety of an earth slope.

UNIT – I

BASIC DEFINITIONS AND SIMPLE TESTS : Soil formation – Three phase diagram – Volume – Weight relationships – Water content – Specific gravity – In-situ density – Relative density.

UNIT – II

INDEX PROPERTIES AND SOIL CLASSIFICATION: Grain size analysis – Sieve and hydrometer methods – Consistency limits and indices – IS classification system of soils.

UNIT – III

PERMEABILITY AND SEEPAGE THROUGH SOILS:

PERMEABILITY: Soil water – Capillary rise – Permeability – factors affecting permeability – Laboratory determination of coefficient of permeability – Permeability of layered soils.

SEEPAGE THROUGH SOILS: Seepage through soils – Flownets – Characteristics and uses - Total, Neutral and Effective stresses – Quick sand condition.

UNIT IV

CONSOLIDATION OF SOILS

Initial, primary and secondary consolidation – Spring analogy for primary consolidation – Consolidation test – e – p and e – log p curves – Terzaghi's theory of one dimensional consolidation – Coefficient of consolidation – Preconsolidation pressure.

UNIT V

SHEAR STRENGTH OF SOILS: Mohr – Coulomb failure theories – Types of laboratory shear strength tests – Strength tests based on drainage conditions and their field applicability

SLOPE STABILITY:Infinite and finite earth slopes – Types of failures – Different factors of safety – Stability analysis of infinite as well as finite slopes(Swedish circle method and method of slices only) – Taylor's stability number.

Text Books:

1. A.V. Narasimha Rao and C. Venkatramaiah, Numerical problems, Examples and Objective Questions in Geotechnical Engineering, Universities press India Limited, Hyderabad.
2. Dr. B. C. Punmia, Ashok kumar Jain and Arunkumar Jain, Soil Mechanics and Foundation engineering, Lakshmi publications (P) Ltd., New Delhi.
3. K. R. Arora, Soil Mechanics and Foundation Engineering, Standard publishers distributor, New Delhi.

Reference Books:

1. A.V. Narasimha Rao, Fundamentals of Soil Mechanics, Laxmi Publications, New Delhi.
2. C. Venkatramaiah, Geotechnical Engineering, New Age International (P) Ltd, Publishers, New Delhi
3. Donald.W.Taylor, Fundamentals of soil mechanics, Asia Publishing house, New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		--	--	--	--		--	--	--	--	3	2	--
CO2	3	3	3	--	--	--	--		--	--	--	--	3	2	--
CO3	3	2	--	--	--	--	--		--	--	--	--	2	2	--
CO4	3	2	--	--	3	--	--	--	3	3	--	1	3	2	--

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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III B.Tech	**L**	**T**	**P**	**C**
Code:14AHS14	**-**	**-**	**3**	**2**

TECHNICAL ENGLISH LAB-II
(Common to all Branches)

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

- Use English fluently in communication by following LSRW.
- Develop the art of oral presentation to develop leadership qualities.
- Assimilate the importance of English in the modern world to compete with the career in the challenging world.
- Strengthen the required skills to be employable.
- Face the interviews confidently and improve the chances of getting a job.

1. **Listening comprehension:** Listening to passage – Understanding the passage – answering the questions – personal and professional situations.

2. Resume writing: Structure – format style – defining career objective – projecting the strengths – preparing covering letter.

3. Speaking Activities:

Just A Minute (JAM) – importance – rules – etiquette – body language.

Debates – importance – rules - beginning – taking a stand – supporting & defending.

Describing objects/people/situations: how to describe – physical properties – material-functions – features - complexion - Attire - situation – place – time – theme.

4. Interview: Preparing for interview – physically and mentally – answering strategy – face-to-face interview – panel interview - tele interview – video conferencing.

5. Oral & PowerPoint Presentation: Importance – developing and organizing the presentations – verbal and visual support - using body language – how to make it effective.

MINIMUMREQUIREMENTFORELCSLAB:

1) Computer aided language lab for 70 students, 70 systems – one master console software for self-study.

2) T.V, digital stereo – audio – visual system.

3) Computer laboratory with LAN Connectivity of minimum 70 multimedia systems with the following configuration.

a) Intel Pentium® D 3.00GHZ

b) RAM-1GB minimum

c) Hard disk – 160GB

d) Headphones of durable quality.

Prescribed Software – Globarena

Suggested Software:

- K-VanAdvancedCommunicationSkills
- TOEFL&GRE (KAPLAN,AARCO&BARRONS,USA, CrackingGRE byCLIFFS)
- DELTA'skeytotheNextGenerationTOEFLTest:AdvancedSkillPractice.
- LinguaTOEFLCBT Insider,byDreamtech
- CambridgeAdvancedLearners'EnglishDictionarywithCD.
- Oxford AdvancedLearner'sCompass,8thEdition
- SanjayKumar&PushpLata.2011. CommunicationSkills,OUP

Reference Books:

1 Meenakshi Raman – Technical Communication,2/e, Oxford University Press, New Delhi.

2 Krishna Mohan &MeeraBenerjiDeveloping Communication Skills by (Macmillan)

3 English Skills for Technical Students, WBSCTE with British Council, OL

4 TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)

5 Robert J Dixson, Everyday Dialogues in English by Prentice – Hall of India Ltd.

6 Koneru, Professional Communication by McGraw Hill.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2									3			3		
CO2	2									3			3		
CO3	2									3			3		
CO4	2									3			3		
CO5	2									3			3		

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(AUTONOMOUS)

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0	0	3	2

III B. Tech – I Semester CE

14ACE29 GEOTECHNICAL ENGINEERING LABORATORY

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

1. Determine index properties of soils.
2. Calculate coefficient of permeability of soils.
3. Determine consolidation and shear characteristics of soils.
4. Apply compaction characteristics of soils.
5. Determine CBR of sub-grade soils.

List of Experiments to be conducted

1. a) Specific gravity.
   b) Defferential free swell index
2. In-situ unit weight
   a) Core cutter method
   b) Sand replacement method
3. Grain – size distribution by Sieve Analysis.
4. Determination of relative density or density index of sand.
5. Atterbegr limits (LL, PL & SL)
6. Coefficient of permeability.
   a) Constant head method
   b) Falling head method
7. I.S. Light compaction
8. California Bearing ratio (CBR) test
9. Direct shear test
10. Unconfined compression test.

Demonstration Experiments

11. Hydrometer analysis.
12. Triaxial Compression test
13. Consolidation test

Laboratory Manual:

1. Appa Rao, K.V.S., And V.C.C. Rao., Soil testing Laboratory Manual, University Science Press, Laxmi Publications Private Limited, New Delhi.
2. Mittal. S., and J.P. Shukla., Soil Testing for Engineers, Khanna Publishers, New Delhi.

Reference books :

Relevant IS Codes.

CO PO MAPPING															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	1	-	-	-	-	-	-	-	-	2	1	-
CO2	3	1	-	1	-	-	-	-	-	-	-	-	2	1	-
CO3	3	1	-	1	-	-	-	-	-	-	-	-	2	1	-

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

III B.Tech I SEMESTER

L	T	P	C
3	0	0	2

14AHS16 Quantitative Aptitude and Reasoning -II
(Common to all Branches)

Outcomes:

After completion of the course the student will be able to

1. solve real life problems.
2. Solve linguistic problems.
3. Develop the thinking ability and apply Quadratic equations.
4. Apply the Analytical Reasoning puzzles to solve linear and circular arrangements
5. Analyze the blood relation puzzles in a family tree.

Syllabus for Quantitative Aptitude

Competency 1:

1. Area
- Formulas for Areas
- Problems on Areas

2. Volumes &Surface Areas
- Problems on Volumes
- Problems on Surface Areas

3. Races & Games of Skill

4. **Calendars**
- Definition of a Leap Year
- Finding the number of Odd days
- Framing the year code for centuries
- Finding the day of any random calendar date

5. **Clocks**
- Finding the angle when the time is given
- Finding the time when the angle is known
- Relation between Angle, Minutes and Hours
- Exceptional cases in clocks

6. **Stocks & Shares**

7. Permutation and Combinations
- Definition of permutation
- Problems on Permutations
- Definition of Combinations
- Problems on Combinations

Competency 2:

8. Probability
- Definition of Probability
- Problems on coins
- Problems on dice
- Problems on Deck of cards
- Problems on Years

9. True Discount

10. Banker's Discount

11. Heights & Distances

12. Odd man out & Series
- Problems on number Odd man out
- Problems on letter Odd man out
- Problems on verbal Odd man out

13. Data Interpretation

- Problems on tabular form
- Problems on Line Graphs
- Problems on Bar Graphs
- Problems on Pie Charts

Syllabus for Reasoning

Competency 3:
Deductions

- Finding the conclusions using Venn diagram method
- Finding the conclusions using syllogism method

Connectives

- Definition of a simple statement
- Definition of compound statement
- Finding the Implications for compound statements
- Finding the Negations for compound statements

Competency 4:
Analytical Reasoning puzzles

- Problems on Linear arrangement
- Problems on Circular arrangement
- Problems on Double line-up
- Problems on Selections
- Problems on Comparisions

Competency 5:
Blood relations

- Defining the various relations among the members of a family
- Solving Blood Relation puzzles
- Solving the problems on Blood Relations using symbols and notations

Text Books:

1. GL Barrons,Tata Mc Graw Hills, 'Thorpe's Verbal reasoning', LSAT Materials.

2. R S Agarwal, 'A Modern approach to Logical reasoning' , S chand Company Ltd 2002.

Reference Books:

1. Abhjit Guha 'Quantitative Aptitude' Tata Mc Graw Hills, 4th Edition, 2011.

2. R S Agarwal, 'Quantitative Aptitude' S. Chand Company Ltd 2008.
3. G.L BARRONS 'Quantitative Aptitude'.Tata Mc Graw Hills.

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III B.Tech – II Semester CE

L	T	P	C
3	1	0	3

14ACE30 DESIGN AND DRAWING OF STEEL STRUCTURES

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

1.Understand the behaviour of steel as a structural member& different types of connections.

2. Apply the knowledge of mathematics, science and engineering fundamentals in the design of structural elements.

3. Analyse the structural element, bolted, riveted and welded connections.

3. design various components of roof trusses

4. design the plate girders and gantry girders

5. Design the plate girders and gantry girders

UNIT I

Introduction: Basic properties of steel as a structural steel – stress-strain relationship, yield strength, ultimate strength. Limit state design – introduction, analysis procedure and design philosophy, comparison with working stress method. Other design requirements- local buckling, fabrication and erection. Classification of sections.

Simple Connections: Bolted connections – Welded connections – Design Strength – Efficiency of joint

UNIT II

Tension and Compression members: Buckling class – slenderness ratio, design. Built-up sections – design of laced and battened columns. Column splice, column base – slab base and gusseted base.

UNIT III

Beams: Design of Beams – Plastic moment Bending and shear strength laterally supported and unsupported beams design – Built up sections – large plates Web buckling Crippling and Deflection of beams.

UNIT IV

Eccentric and moment connection: Beam-column connections- design of welded and bolted framed connections. Seated and framed connections (without design). Moment resistant connections (without design).

Roof Truss: Analysis of simple roof truss by graphical method, design of purlins and truss joints

UNIT V

Plate Girder: Design consideration – I S Code recommendations Design of plate girder-Welded – Curtailment of flange plates stiffeners – splicing and connections.

Gantry Girder: Gantry girder impact factors – longitudinal forces, Design of Gantry girders.

Note: The students should prepare the following plates.

Plate 1 Detailing of simple beams

Plate 2 Detailing of Compound beams including curtailment of flange plates.

Plate 3 Detailing of Column including lacing and battens.

Plate 4 Detailing of Column bases – slab base and gusseted base

Plate 5 Detailing of steel roof trusses including particulars at joints.

Plate 6 Detailing of Plate girder including curtailment, splicing and stiffeners.

FINAL EXAMINATION PATTERN:
The end examination paper should consist of Part A and Part B. Part A consist of two questions in Design and Drawing out of which one question is to be answered. Part B should consist of five questions on design out of which three are to be answered. Weightage for Part – A is 40% and Part- B is 60%.

Text Books:
1. S.K. Duggal - Limit State Design of steel structures , Tata Mcgraw Hill, New Delhi.
2. Subramanyam.N - Steel Structures , Oxford University press, New Delhi

Reference Books:
1. Bhavikatti - Design of steel structures .IK int Publication House, New Delhi, 2010.
2. Ramchandra –Design of Steel Structures, Standard Book House, New Delhi
3. K.S.Sai Ram - Design of Steel Structures, Pearson Pubilishers.

Codes/Tables:
IS Codes:
1) IS -800 – 2007
2) IS – 875 – Part III
3) Steel Tables.
4) Railway Design Standards Code

Note :IS -800 – 2007, IS – 875 – Part III and Steel Tables are permitted in the examination hall

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2	PSO3
CO1	3		3	--	--	--	--	--	--	--	--	--	3		
CO2	3	1	3	--	--	--	--	--	--	--	--	--	3		
CO3	3	2	--	--	--	--	--	--	--	--	--	--	2		
CO4	3	2	--	2	--	--	--	--	--	--	--	--	3		
CO5	3		1	--		--	--	--	--	--	--	1	3		

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IIIB.Tech – II Semester CE	**3**	**1**	**3**

14ACE31 **TRANSPORTATION ENGINEERING**

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

1. Plan highway networks
2. Conduct surveys involved in planning and highway alignment
3. Design highway geometrics and pavements
4. Estimate traffic for various studies
5. Determine the characteristics of pavement materials

UNIT-I

HIGHWAY DEVELOPMENT AND PLANNING: Highway development in India – Necessity for Highway planning – Different road development plans – Classification of Roads – Road Network Patterns – Highway Alignment – Factors affecting alignment – Engineering Surveys.

UNIT-II

HIGHWAY GEOMETRIC DESIGN: Importance of Geometric Design – Design controls and criteria – Highway Cross Section Elements – Sight distance elements: Stopping sight distance, Overtaking sight distance and Intermediate sight distance – Design of Horizontal Elements – Design of Super elevation and extra widening – Design of Transition curves – Design of Vertical Alignment – Gradients – Vertical curves.

UNIT-III

TRAFFIC STUDIES: Traffic Studies: Traffic volume study – Presentation of volume study – Speed Study – Spot speed study - Presentation of spot speed data – speed and delay study - Origin and Destination study - Relationship between speed, travel time, volume, density and capacity – Parking study – Accident study

UNIT-IV

INTERSECTION DESIGN: Types of Intersections – conflicts at Intersections – Types of At-grade intersections – channelization: objectives and design criteria– Types of Grade separated Intersections - Rotary Intersection – concept of Rotary and Design criteria – Advantages and Disadvantages of Rotary Intersection.

TRAFFIC REGULATIONS AND MANAGEMENT: Road traffic signs – types and specifications – Road markings – types and need for road markings – specifications- Signals – Design of traffic signals – Webster method – IRC method – Numerical Problems.

UNIT-V

HIGHWAY MATERIALS: Stone aggregates **–** Desirable properties of road aggregates – Test for road aggregate – Tests on Bitumen – Cutback bitumen – Bituminous Emulsion –

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

Text Books:

1. S.K.Khanna, C.E.G Justo. Highway Engineering. 9th Edition, Nemchand& Bros, 2011.
2. Dr. S.K. Sharma. Principles,Practice& Design of Highway Engineering including Airport Pavements. S Chand and Company, 2012.

Reference Books:

1. Dr. L.R Kadiyali. Traffic Engineering & Transportation Engineering. 6th Edition, Khanna Publishers, 1997.
2. ParthaChakroborty&Animesh Das. Principles of Transportation Engineering. 1st Edition, Phi Learning, 2009.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	--	--	--	--	--	--	--	--	--	--	2	3	2
CO2	3	2	3	--	--	--	--	--	--	--	--	--	3	1	1
CO3	3	3	2	1	2	--	--	--	--	--	--	--	3	2	1
CO4	3	3	--	1	--	1	--	--	--	--	--	--	3	2	1
CO5	3	2	2	1	--	2	2	--	--	--	--	--	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY

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III B. Tech – II Semester CE

14ACE32 ESTIMATING COSTING AND VALUATION

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

1. Apply different types of estimates in different items of work
2. Estimate quantity of work and cost of construction
3. Estimate earthwork quantity for road & canal projects
4. Analyse cost for construction practices
5. Understand types of tenders and contracts

UNIT I:

INTRODUCTION: Estimating, Types of estimates and data required, Different items of work and units of measurement, Detailed and approximate estimate-advantages and disadvantages

SPECIFICATION: Importance of Specification, Types of Specification.

Specification of Earthwork in excavation, Cement Concrete, Brick Masonry, R.C.C Work, Plastering Work, Painting and Flooring

UNIT II:

ESTIMATION OF BUILDINGS: Methods of Detailed Estimation, Quantity Estimation of One/Two/Three roomed Buildings, Estimation of Masonry Work in Arches and Steps.

UNIT III:

EARTHWORK ESTIMATION: Methods of calculating earthwork quantities for roads and canals

REINFORCEMENT ESTIMATION: Preparing Bar Bending Schedule. Estimation of quantity of reinforcement in Beams, Columns, Slabs

UNIT IV:

RATE ANALYSIS: Importance of rate Analysis, Task, Outgoings, Schedule of Rates (SOR).

Rate analysis for earthwork in excavation, C.C Works, Brick Masonry work,R.C.C Work, Plastering and Flooring Work.

UNIT V:

TENDERS AND CONTRACTS: Types of Contracts, Types of Tenders, Conditions of Contracts, FIDIC family of Contract, Legal Requirements

VALUATION: Cost, Price and Value; Types of Properties, Methods of valuation, Depreciation and Types, Different forms of Values, Fixing Rent for Property.

Text Books:

1. Dutta, B.N., "Estimating and Costing in Civil Engineering: Theory and Practice, Including Specifications and Valuation', 23rd Revised edition (2006),UBS Publishers and Distributors Pvt.Ltd

2. Birdie, G.S., " Text Book of Estimating and Costing (CIVIL ENGINEERING)", 7th Edition (2015), Dhanpat Rai Publishing Company (P) Ltd-New Delhi.

Reference Books:

1. Kohli, R.C., Kohli, D.D., "A Textbook of Estimating, Costing & Accounts (Civil)" 12th Edition, S. Chand & Company Ltd-New Delhi.
2. Roy, M.S., "Quantity Surveying and Contract & Tenders", Vayu Education of India First edition (2015).

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	--	2	--	--	--	1	--	--	--	3	1	
CO2	3	1	3	--	1	--	--	--	1	--	--	--	3	1	
CO3	3	2	--	-	2	--	--	--	1	--	--	--	2	1	
CO4	3	2	--			--	--	--	1	--	--	--	3	1	
CO5	3		1	--		2	1	1	1	--	--	1	3	1	

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III B.Tech – II Semester CE

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3	1	3

14ACE33 **ENVIRONMENTAL ENGINEERING – II**

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

1 estimate sewage and storm water for arriving design flows.

2. Plan, design, operate and maintain sewerage and sewage treatment units.

3 plan and manage treatment plant residues and effluent disposal practices.

4. Define characteristics and execute disposal of solid wastage managements.

5.demonstrate air and noise pollution and environmental impact assessment in civil engineering projects.

UNIT-I

ESTIMATION OF SEWAGE AND STORM WATER: Definition of terms – sewage, sullage, storm water and sludge. Objectives of sewage and storm water estimations and general methods available for estimations in urban areas. Average, peak and minimum sewage flows and their importance in collection and treatment systems. Design period for various components of sewerage and sewage treatment process components.

COLLECTION OF SEWAGE: Sewage collection by different sewers and their functions. Separate and combined sewers and their merits and demerits. Hydraulic design of sewers for full and partial flow system. Self-cleansing velocity of sewers. Construction of sewers. Sewer appurtenances and their location and functions. House drainage and plumbing systems.

UNIT-II

CHARACTERIZATION OF SEWAGE: Objectives of sewage characterization. Frequency of sampling of sewage for different parameters.Chemical composition of sewage – solids, BOD and COD, nutrients and biological impurities. Numerical problems on BOD equation.Population equivalent. Carbon, Nitrogen and Sulfur cycles.

PRELIMINARY AND PRIMARY TREATMENT: Basic concept of sewage treatment – Preliminary, primary, secondary and tertiary sewage treatment processes. Sewage treatment process flow diagrams for urban and rural areas. Design of bar screen, grit chamber and primary sedimentation tanks.

UNIT-III

SECONDARY TREATMENT: Necessity of secondary treatment principles of biological treatment of sewage and mechanism of purification factors influencing biological treatment of sewage. Suspended and attached growth of biological system. Design of conventional and

extended type of activated sludge processes, sequential batch reactors, UASB reactors, aerated lagoons and facultative oxidation ponds. Design of secondary sedimentation tanks. Operational problems and trouble-shooting of biological treatment process units.

UNIT-IV

TERTIARY TREATMENT: Objectives of tertiary treatment. Removal of nitrogen, phosphorus ,and refractory organics, from secondary treated swage. Standards for disposal of treated sewage into inland surface waters, marine disposal and on land for invigation.Water reuse and their prospects.

SLUDGE MANAGEMENT: Qualitative and quantitative aspects of different sludges generated from different treatment units operation and processes. Sludge stabil

ization by aerobic and anaerobic processes .Design of anaerobic sludge digesters. Sludge dewatering practices – sludge drying beds and centrifugation. Sludge disposal practices. Design of septic tank and soak – pit. In rural and semi urban areas.

UNIT- V

SOLID WASTE MANAGEMENT: Sources, characteristics and generation of solid wastes. Collection and disposal.Design and management of sanitary landfills.

AIR AND NOISE POLLUTION: Types of air pollutants, sources and effect of air pollution, air pollution metrology, air pollution control, air quality standards and limits. Sources and effects of noise pollution, measurement of noise and control of noise pollution. Permissible limits of noise pollution.

ENVIRONMENTAL ASSESSMENT: Environmental impact assessment of major civil engineering projects.

Text Books:

1. KariaG.L , and R.A. Christian, " Waste water Treatment : Concepts and Design Approach", Prentice Hall of India, New Delhi.

2. Punmia, B.C and A.K. Jain, " Waste water Engineering, Lakshmi Publications (p) Ltd., New Delhi, 1996.

Reference Books

1. Met calf & Eddy " Waste water Engineering – Treatment and Reuse", Tata Mc Graw –Hill Edition, New Delhi.

2. Arcadio P. Sincero Sr., GregoriaA.Sincero, "Environmental Engineering a design approach". Prentice, Hall of India Private Limited , New Delhi-110 001,1999.

3. Peavy, H.S and D.R. Rowe " Environmental Engineering" MC Graw-Hill Publishing company, Newyork, 1984.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		--	--	2	2		--	--	--	--	3	2	--
CO2	3	3	3	--	--	2	2		--	--	--	--	3	2	--
CO3	3	2	--	--	--	1	1		--	--	--	--	2	2	--
CO4	3	2	--	--		2	2	--	3	3	--	1	3	2	--
CO5	2	--	--	--	--	2	2	--	--	--	--	--	2	--	--

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III B.Tech – II Semester CE

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3	1	3

14ACE34 GEOTECHNICAL ENGINEERING -II

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

1. Apply the knowledge of compaction in selecting the compaction equipment.
2. Analyse the stresses in soils duo to applied loads.
3. Evaluate the probable settlements of foundations and SBC of soils.
4. Estimate load carrying capacity of piles
5. apply the design principles of a gravity retaining wall.

UNIT – I

SOIL EXPLORATION AND COMPACTION

SOIL EXPLORATION: Need – methods of soil exploration – Boring and sampling methods – penetration tests – planning of programme and preparation of soil investigation report.

COMPACTION: Mechanism of compaction – factors affecting – effect of compaction on soil properties – field compaction equipment – compaction control.

UNIT – II

STRESS DISTRIBUTION IN SOILS

Geostatic stresses – stresses due to applied loads – Boussinesq's Theory – Vertical stress due to point load, line load, strip load, uniformly loaded circular area, uniformly loaded rectangular area – Newmark's chart – westergaard's theory – pressure bulb concept – Approximate methods – Contact pressure distribution.

UNIT – III:

EARTH PRESSURE ON RETAINING WALLS

Introduction – Plastic equilibrium in soils – Active and passive states – Earth pressure at rest – Rankine's theory – Coulomb's wedge theory – Culmann's and Rebhann's graphical methods for active earth pressure – stability considerations for gravity retaining walls.

UNIT IV

BEARING CAPACITY AND SETTLEMENT OF SHALLOW FOUNDATIONS.

BEARING CAPACITY: Types and choice of foundation – Depth of foundation – Types of shear failures – safe bearing capacity – Terzaghi's analysis – Meyerhof's analysis – Skempton's analysis – IS Method – Effect of water table on bearing capacity - Plate load test.

SETTLEMENT :Types of settlement – Tolerable settlements – Allowable soil pressure for both cohesionless and cohesive soils.

UNIT V :

PILE FOUNDATIONS.

Necessity – Classification – Load carrying capacity of piles – Static methods – Dynamic formulae – Insitu penetration tests – pile load tests – Negative skin friction – group action in piles – Settlement of pile groups,

Text Books :

1. C. Venkatramaiah, Geotechnical Engineering, New Age International (P) Ltd, Publishers,New Delhi.
2. K. R. Arora, Soil Mechanics and Foundation Engineering, Standard Publishers Distributor,Delhi.

Reference Books :

1. Joseph E. Bowles, Foundation Analysis and Design, MC Graw – Hill, Inc., New Delhi.
2. Dr. B. C. Punmia, Ashok kumar Jain and Arunkumar Jain, Soil Mechanics and Foundation Engineering, Lakshmi Publications (P) Ltd., New Delhi.
3. A.V. Narasimha Rao and C. Venkatramaiah, Numerical problems, Examples and Objective Questions in Geotechnical Engineering, Universities Press India Limited, Hyderabad

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
CO1	3	3		--	--	--	--		--	--	--	--	3	2	--
CO2	3	3	3	--	--	--	--		--	--	--	--	3	2	--
CO3	3	2	--	--	--	--	--		--	--	--	--	2	2	--
CO4	3	2	--	--	3	--	--	--	3	3	--	1	3	2	--
CO5	2	--	--	--	--	--	--	--	--	--	--	--	2	--	--

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III B.Tech – II Semester ME

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14ACE27 **(Common to CE & ME)**
(Choice Based Credit Course, Inter-Departmental)
RENEWABLE ENERGY SOURCES

Course Outcomes: After completion of the course the student will be able to

1. Explain the process of solar radiation and its collectors.
2. Understand and apply the principles of solar energy storage systems and solar cells with applications.
3. Design systems for conversion of bio mass and geothermal energy into useful energy.
4. Understand and demonstrate the Ocean, Wind and Tidal Energy conversion systems.
5. Apply various direct energy conversion systems

Unit – I

SOLAR RADIATION AND COLLECTION: Introduction To Energy Sources -Solar energy – Physics of the Sun – Transfer of solar energy – Solar Constant - Sun-Earth angles – Hour angle - Availability and limitations of solar energy - Terrestrial and extra terrestrial radiation - Direct and Diffuse Radiation - Solar radiation on tilted surface - instruments for measuring solar radiation – Sun shine recorder - Solar thermal collectors – Flat plate and concentrating collectors

Unit – II

SOLAR ENERGY STORAGE AND APPLICATION: Solar water heating system - Solar distillation - Solar cookers - solar dryers – Solar heating and cooling- Solar energy storage – Sensible and latent heat storage – solar Ponds — photovoltaic conversion - Solar Cell - High concentrator solar cells – Losses in solar cells - Emerging solar cell technologies. Solar Power Plant – Central tower receiving system.

Unit III

BIOMASS ENERGY: Energy from biomass – Sources of Biomass – conversion of biomass into fuel – energy through fermentation – Pyrolysis - Gasification and Combustion – Aerobic and Anaerobic bio-conversion – Biogas digesters – Properties and characteristics of biogas and utilization.

GEOTHERMAL ENERGY: Fundamental of Geophysics - Classification of Geothermal sources —Extraction techniques – Utilization of Geothermal energy

Unit IV

OCEAN, WIND and TIDAL ENERGY: - OTEC Principle –- Open and closed cycle of OTEC –Wind Energy – Horizontal and Vertical axis windmills – Performance characteristics – Betz criteria – Wave and tidal Energy – Potential and conversion techniques.

Unit V

DIRECT ENERGY CONVERSION: Need for DEC - Principle of DEC - Electron gas dynamic conversion - Thermo Electric Generators - Seebeck, Peltier and Joule Thomson effects – MHD generators - Principles – dissociation and ionization – hall effect – MHD accelerator – MHD Engine – Power generating systems

Fuel Cells – Principle of fuel cell - Types of fuel cells, comparison of battery Vs fuel cell - merits and demerits – applications of fuel cells.

Text Books:

1. G.D. Rai, Non-Conventional Energy Source, Khanna Publishers, 2011.
2. ER. R.K. Rajput, Non-Conventional Energy Sources and Utilisation, S.Chand Publishers, 2012.

References:

1. B.S.Magal, Frank Kreith&J.F.Kreith, Solar Power Engineering, Tata McGraw Hill, 2000.
2. J P Navani & Sonal Sapra, Non-Conventional Energy Resources, S Chand Publishers, 2013.
3. S.P. Sukhatme, Solar Energy: Principles of Thermal Collection and Storage, 3rd Edition, Tata McGraw Hill.

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III B.Tech – II Semester CIVIL	**L**	**T**	**P**	**C**
	3	**1**	**0**	**3**

14ACS29 ARTIFICIAL INTELLIGENCE

Outcomes:

At the end of the course, students should be able to:

1. Apply the approaches to artificial intelligence.
2. Evaluate problem solving searching techniques.
3. Apply first order logics.
4. Apply Knowledge representation concepts for problem solving.
5. Apply learning from examples

UNIT – I

Introduction: What Is AI, The Foundations of Artificial Intelligence, The History of Artificial Intelligence, The State of the Art.

Intelligent Agents: Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments , The Structure of Agents

UNIT – II

Solving Problems by Searching: Problem-Solving Agents, Uninformed Search Strategies, Informed (Heuristic) Search Strategies, Heuristic Functions.

Constraint Satisfaction Problems: Definition, Constraint Propagation, Backtracking Search, Local Search, The Structure of Problems

UNIT – III

Logical Agents: Knowledge-Based Agents, Propositional Logic, Propositional Theorem Proving, Effective Propositional Model Checking, Agents Based on Propositional Logic.

First-Order Logic: Syntax and Semantics, Knowledge Engineering in FOL, Inference in First-Order Logic, Unification and Lifting, Forward Chaining, Backward Chaining, Resolution

UNIT – IV

Planning: Definition, Algorithms, Planning Graphs, Hierarchical Planning.

Knowledge Representation: Ontological Engineering, Categories and Objects, Events, Mental Events and Mental Objects, Reasoning Systems for Categories, Reasoning with Default Information.

UNIT – V

Learning from Examples: Forms of Learning, Supervised Learning, Learning Decision Trees, Ensemble Learning; Learning Probabilistic Models, Reinforcement Learning.

TEXT BOOK:

Russel S, Norvig P, Artificial Intelligence: A Modern Approach, 3rd edition, Pearson Education, 2010.

REFERENCE BOOKS:

1. Rich E, Knight K, Nair S B, Artificial Intelligence, 3rd edition, Tata McGraw-Hill, 2009.
1. Luger George F, Artificial Intelligence: Structures and Strategies for Complex problem solving, 6th edition, Pearson Education, 2009
2. Carter M, Minds and Computers: An Introduction to the Philosophy of Artificial

Intelligence, Edinburgh University Press, 2007.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3												2		
CO2	3												2		
CO3	3												2		
CO4	3												2		
CO5	3												2		

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III B. Tech – II Semester CE	**0**	**0**	**3**	**2**

14ACE36 **ENVIRONMENTAL ENGINEERING LAB**

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

1. Analyse and interpret data on water, waste water and solid waste to characterize the pollution potential.

2. design gravimetric, titrimetric and colorimetric and other instrumental technologies on water, waste water and solid waste to select appropriate unit operates and processes on engineering tools.

3. analyse the impact of water, waste water and solid waste pollution on public, safetyaquatic, terrestrial and atmospheric environment..

1. (a) Determination of pH and Electrical Conductivity of water and waste water.
   (b) Determination of Turbidity of water.

2. Determination of
   (a) Total ,Suspended and Dissolved Solids in a sewage.
   (b) Organic and Inorganic Solids content of sewage.

3. (a) Determination of Acidity of water.
   (b) Determination of Alkalinity of water.

4. Determination of :
   (a) Hardness of water.
5. (b) Determination of Chlorides in Q water.
   (c) Determination of Sulphates in Q water.

6. (a) Determination of Dissolved Oxygen of water.
   (b) Determination of Residual Chlorine content of municipal tap water.

7. (a) Determination of Optimum Coagulant Dose of raw water.
   (b) Determination of MPN Index of natural water.

8. Determination of BOD of sewage .

9. Determination of COD of sewage.

10. Municipal Solid Waste Analysis for physical components.

Lab Manual :

1.Kotaiah.B. andN.Kumarswamy. Environmental Engineering Lab Manual, 2nd Ed. Charotar Publisher,Anand,2004

Reference Books:

1. APHA. Standard Methods for the Examination of water and wastewater 19th Ed. American Public Health Association,Washington,DC 2005,1995.

CO PO MAPPING															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	2	-	-	-	-	-	-	-	-	2	1	-
CO2	3	1	-	2	-	-	-	-	-	-	-	-	2	1	-
CO3	3	1	-	2	-	-	-	-	-	-	-	-	2	1	-
CO4	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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III B. Tech – II Semester CE

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14ACE37 CONCRETE AND HIGHWAY MATERIALS LAB

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

. Understand the procedures for testing cement, Fine aggregates, Coarse aggregates.

2. Explain procedures for testing hardened concrete, and fresh concrete

3apply different grades of bitumen for durability aspect.

4. analyse the characteristics of the pavement material.

List of Experiments:

I. TESTS ON AGGREGATES:

1. Determination of strength of the aggregate by crushing test using compression testing machine

2. a) Determination of toughness value of aggregate by impact test

   b) Determination of water absorption value of aggregate by using water absorption test.

3. Determination of flakiness index and elongation index by shape test using thickness gauge and length gauge.

II. TESTS ON BITUMEN:

4. a) Determination of grade of bitumen by penetration test using penetrometer.

   b) Determination of stripping value of aggregate by using stripping value test

5. Determination of ductile value of bitumen using ductility testing machine

6. Determination of viscous value of bitumen by viscosity test using viscometer.

7. Determination of softening value of the bitumen using ring and ball test

8. Determination of flash point and fire point by using Penskey Martin's testing machine.

DEMONSTRATION:

9. Determination of Marshall stability value and flow value of prepared sample by using Marshall Stability testing machine.

10. Determination of separation of bitumen from aggregate by using bitumen extraction test.

III. CEMENT AND CONCRETE:

1. a) Fineness of cement by dry–sieving method &Blairs air permeability apparatus.
   b) Specific gravity of cement
2. a) Standard consistency of cement paste.
   b) Soundness of cement (By Lechatelier method)

3. Initial and final setting of cement
4. Compressive strength of cement.
5. a) Grain size distribution of fine aggregate.
   b) Specific gravity of fine aggregate.
6. a) Grain size distribution of coarse aggregate.
   b) Specific gravity of coarse aggregate
7. Bulking of sand.
8. a) Workability of fresh concrete by slump cone method.
   b) Workability of fresh concrete by compaction factor method.
9. a) Compressive strength of concrete.
   b) Split tensile strength of concrete.
   c) Modulus of rupture of concrete.
10. Demonstration of rebound test hammer

Lab Manual:

1. Duggal, Ajay, K. and Vijay P.Puri.- Lab manual in Highway Engineering.,New Age pubilications, New Delhi

Reference Books:

1. Shetty.M.S (2002), Concrete Technology, S. Chand & Co., Ltd, Ramnagar.
2. IS: 10262 – 1987, Indian Standard specification for Methods of Mix design.
3. IS: 383 – 1987, Indian Standard specification for Test for Fine and Coarse aggregates.

CO PO MAPPING															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	2	2	-	-	-	-	-	-	-	3	2	-
CO2	3	-	-	2	2	-	-	-	-	-	-	-	3	2	-
CO3	3	-	-	2	2	-	-	-	-	-	-	-	3	2	-
CO4	3	-	-	2	2	-	-	-	-	-	-	-	3	2	-

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III B.TECH –II SEMESTER CE

14AMB01 TOTAL QUALITY MANAGEMENT

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

- describe principles of management
- Apply concepts in administering technology driven industrial units.
- explain management functional areas like Production, HR, Marketing ~~etc~~
- apply OR techniques for project management andto analyse the importance of production in the organization

UNIT- I

INTRODUCTION

Introduction – Need for quality – Evolution of quality – Definitions of quality – Dimensions of product and service quality – Basic concepts of TQM – TQM Framework – Contributions of Deming, Juran and Crosby – Barriers to TQM – Quality statements – Customer focus – Customer orientation, Customer satisfaction, Customer complaints, Customer retention – Costs of quality.

UNIT- II

TQM PRINCIPLES

Leadership – Strategic quality planning, Quality Councils – Employee involvement – Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal – Continuous process improvement – PDCA cycle, 5S, Kaizen – Supplier partnership – Partnering, Supplier selection, Supplier Rating.

UNIT- III

MATERIALS MANAGEMENT

Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records, MRP, JIT.

MARKETING

Functions of Marketing, Marketing Mix, Product Life Cycle, Channels of Distribution.

UNIT- IV

HUMAN RESOURCES MANAGEMENT (HRM)

Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Wage and Salary Administration, Job Evaluation and Merit Rating, Performance Appraisal.

UNIT- V

QUALITY SYSTEMS

Need for ISO 9000 – ISO 9001-2008 Quality System – Elements, Documentation, Quality Auditing – QS 9000 – ISO 14000 – Concepts, Requirements and Benefits – TQM Implementation in manufacturing and service sectors.

TEXT BOOKS:

1. Dale H. Besterfiled, et at., "Total quality Management", Third Edition, Pearson Education Asia, Indian Reprint, 2006.
2. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th Edition, First Indian Edition, Cengage Learning, 2012.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3				--	--	--	--	--	--	1	--	2	--	--
CO2		2		3	3	--	--	2	--	--	2	--	2	--	--
CO3					2	--	--	--	--	--	--	1	2	--	--
CO4	2				--			--	--	--	--	1	2	--	--

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IV B.Tech – I Semester CE

L	T	P	C
3	1	0	3

14ACE38 FINITE ELEMENT METHODS IN CIVIL ENGINEERING

Course Outcomes: After completion of the course the student will be able to

1. Develop shape functions and stiffness matrices for 1D, 2D elements, global stiffness matrices and global vectors.
2. Analyze planar structural system using finite element model.
3. Apply natural and area co-ordinate system to CST & LST
4. analyze the static loading problems.
5. Compute the stiffness matrix for iso-parametric elements.

UNIT I

INTRODUCTION: Concepts of FEM – Steps involved – merits & demerits – energy principles –Discretization – Rayleigh –Ritz method of functional approximation.

PRINCIPLES OF ELASTICITY: Equilibrium equations – strain displacement relationships in matrix form – Constitutive relationships for plane stress, plane strain and Axi-symmetric bodies of revolution with axi-symmetric loading.

UNIT II

ONE DIMENSIONAL & TWO DIMENSIONAL ELEMENTS: Stiffness matrix for bar element – shape functions for one dimensional elements – one dimensional problems .Two Dimensional Elements - Different types of elements for plane stress and plane strain analysis – Displacement models – generalized coordinates – shape functions – convergent and compatibility requirements –Geometric invariance – Natural coordinate system – area and volume coordinates

UNIT III

GENERATION OF ELEMENT: Generation of element stiffness and nodal load matrices for 3-node triangular element and four node rectangular elements.

UNIT IV

ISOPARAMETRIC FORMULATION: Concepts of, isoperimetric elements for 2D analysis – formulation of CST element, 4 –Noded and 8-noded iso-parametric quadrilateral elements –Lagrangian and Serendipity elements.

AXI-SYMMETRIC ANALYSIS: Basic Principles-Formulation of 4-noded iso-parametric axisymmetric element

UNIT V

SOLUTION TECHNIQUES: Numerical Integration, Static condensation, assembly of elements and solution techniques for static loads.

Text Books:

1. R. Chandranpatla and Ashok D.Belegundu.Tirupati.Finite Elements Methods in

Engineering– Pearson Education Publications.
2. Desai, Finite element method and its application,2012, Pearson Pubilications.
3. C.S.Krishna Murthy. Finite Element analysis – Theory & Programming- Tata Mc.Graw Hill Publishers.

Reference Books:

1. H.V.Lakshminaryana. Finite element analysis and procedures in engineering, 3rd edition,universities press, Hyderabad.
2. S.Rajasekharan. Finite element analysis in Engineering Design, S.Chand Publications, NewDelhi.
3. S.S. Bhavakatti. Finite element analysis-New age international publishers.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		3	--	--	--	--	--	--	--	--	--	3		
CO2	3	1	3	--	--	--	--	--	--	--	--	--	3		
CO3	3	2	--	--	--	--	--	--	--	--	--	--	2		
CO4	3	2	--		--	--	--	--	--	--	--	--	3		
CO5	3		1	--	3	--	--	--	--	--	--		3		

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L	T	P	C
1	0	3	3

14ACE39 DESIGN AND DRAWING OF IRRIGATION STRUCTURES

Course Outcomes: After completion of the course the Students will be able to

1. Apply knowledge of mathematics, science, engineering
2. Classify the maps, coordinate systems and projections
3. Process and use spatial and attribute data to prepare thematic maps
4. Identify and rectify mapping inaccuracies
5. Formulate and solve geospatial problems

Design and drawing of the following irrigation structures:

1. Sloping glacis weir.
2. Tank sluice with tower head
3. Type III Syphon aqueduct.
4. Surplus weir.
5. Trapezoidal notch fall.
6. Canal regulator.

Final Examination pattern: Any two questions of the above six designs may be asked out of which the candidate has to answer one question. The duration of examination will be three hours.

Text Books:

1. Satyanarayana Murthy, C. Design of minor irrigation and canal structures. Wiley eastern Ltd, New Delhi.
2. Garg, S.K. Irrigation engineering and Hydraulic structures. Standard Book House.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		3	--	--	--	--	--	--	--	--	--	3		
CO2	3	1	3	--	--	--	--	--	--	--	--	--	3		
CO3	3	2	--	--	--	--	--	--	--	--	--	--	2		
CO4	3	2	--		--	--	--	--	--	--	--	--	3		
CO5	3		1	--	3	--	--	2	--	--	--		3		

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L	T	P	C
3	1	0	3

14ACE40 BRIDGE ENGINEERING

Course Outcomes: After completion of the course the Students will be able to

1. Apply the knowledge of mathematics in bridge design system.
2. Analyse the bridge components
3. Design the bridge components

UNIT I

INTRODUCTION: Importance of site investigation in Bridge design, Highway Bridge loading standards, Railway Bridge loading standards (BG, MG), various loads in bridges, Impact factor.

BOX CULVERT: General aspects: Design loads, Design of Box culvert subjected to IRC class-AA tracked vehicle only.

UNIT II

DECK SLAB BRIDGE: Introduction, Effective width method of Analysis, Design of deck Slab Bridge (Simply supported) subjected to class AA Tracked Vehicle only.

UNIT III

BEAM & SLAB BRIDGE (T-BEAM BRIDGE): General features, Design of interior panel of slab, (Pigeauds method), Design of a T-beam bridge subjected to IRC class AA tracked vehicle only.

UNIT IV

PLATE GIRDER BRIDGE: Introduction, Elements of a plate girder and their design,Design of a Deck type welded plate girder Bridge of single line B.G.

COMPOSITE BRIDGES: Introduction, Advantages, Design of Composite Bridges consisting of RCC slabs over steel girders including shear connectors.

UNIT V

BRIDGE BEARINGS: General features, Types of Bearings, Design principles of steel Rocker & Roller Bearings, Design of a steel Rocker Bearing, Design of Elastomeric pad Bearing.

PIERS & ABUTMENTS: General features, Bed Block, Types of piers, Forces acting on piers, Stability analysis of piers, forces acting on abutments, Stability analysis of abutments, Types of wing walls,Approaches,Types of Bridge foundations (excluding Design).

Text Books:

1. T.R.Jagadish &M.A.Jayaram, Design of Bridges Structures, Prentice Hall of India Pvt., Delhi.
2. D.J.Victor. Essentials of Bridge Engineering, Oxford and IBH Publishers.

Reference Books:

1. Ponnu Swamy. Bridge Engineering, TATA Mcgraw Hill Company, New Delhi.
2. N.Krishnam Raju. Design of Bridges, Oxford & IBH, Publishing Company Pvt.ltd., Delhi.
3. Ramachandra. Design of Steel structures, II Ed. Scientific publishers (INDIA),2009
4. Relevant – IRC & Railway bridge **Codes.**

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	--	--	--	--	--	--	--	--	--	3	2	--
CO2	3	3	3	--	--	--	--	--	--	--	--	--	3	2	--
CO3	3	2	3	--	--	--	--	--	--	--	--	--	2	2	--

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L	T	P	C
3	1	0	3

14ACE41 ADVANCED STRUCTURAL ENGINEERING

Course Outcomes: After completion of the course the Students will be able to

1. Apply IS codes for designing complex reinforced concrete structures
2. Analyse maximum forces and moments involved in designing cantilever and counterfort retaining walls.
3. Design complex concrete structures like flat slab, grid floor, concrete chimney etc.,
4. Prepare reinforcement detailing for reinforced concrete structures.
5. Solve practical design problems like cinema balcony.

UNIT I

Design of a flat slab (Interior panel only) and Grid floor.

UNIT II

Design of concrete bunkers of circular shape – (excluding staging) – Introduction to silos

UNIT III

Design of concrete chimney

UNIT IV

Design of circular and rectangular water tank resting on the ground, Design of Intz water tank (excluding staging)

UNIT V

Design of cantilever and counterfort retaining wall with horizontal back fill, Design of Cinema balcony

Text Books:

1. Krishna Raju. Structural Design and drawing (RCC and steel) UniversitiesPress , NewDelhi
2. Dr. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain. R.C.C Structures,Laxmi Publications, New Delhi
3. Varghese. Advanced RCC, PHI Publications, New Delhi.

Reference Books:

1. Sushil kumar. R.C.C Designs, standard publishing house.
2. N.C.Sinha and S.K.Roy.Fundamentals of RCC, S.Chand Publications, New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	--	--	--	--	--	--	--	--	2	--	--
CO2	3	2	3	2	2	--	--	--	--	--	--	--	2	--	--
CO3	2	1	3	2	2	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--	--	--	--	--	--	--	--	2	--	--
CO5	3	2	--	2	--	--	--	--	--	--	--	--	2	--	--

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L	T	P	C
3	1	0	3

14ACE42 **PRESTRESSED CONCRETE**
(CBCC Dept. Specific - I)

Course Outcomes: After completion of the course the Students will be able to

1. Describe basic principles of pre-tensioning and post tensioning
2. Apply the methods of prestressing and losses of prestress
3. Conduct analysis and design of sections for flexure & shear
4. Perform analysis and design of composite sections.
5. Interpret deflections in pre-stressed concrete beams

UNIT I

INTRODUCTION: Historic development, General principles of pretensioning and post tensioning, Advantages and limitations of prestressed concrete, Materials, High strength concrete and high tensile steel their characteristics.

METHODS OF PRESTRESSING: Prestressing systems: Definitions of common terms in prestressing, Tensioning devices and anchorage devices, Pre-tensioning and post tensioning methods, Different systems of prestressing like Hoyer System, Magnel-Blaton System, Freyssinet system and Gifford – Udall System, Analysis of post- tensioning.

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 stress in steel, slip in anchorage ,bending of member and wobble frictional losses.

UNIT III

ANALYSIS & DESIGN OF SECTIONS FOR FLEXURE: Elastic analysis of concrete beams prestressed with straight, concentric, eccentric, bent and parabolic tendons, Allowable stress, Design criteria as per I.S.Code, Elastic design of simple rectangular and I-section for flexure, Kern lines, cable profile.

UNIT IV

DESIGN OF SECTION FOR SHEAR: Shear and Principal Stresses, Design for Shear in beams.

COMPOSITE SECTION: Introduction, Analysis of stress, Differential shrinkage, General designs considerations.

UNIT V

DEFLECTIONS OF PRESTRESSED CONCRETE BEAMS: Importance of control of deflections, factors influencing deflections, short term deflections of uncracked members, prediction of long term deflections.

Text Books:

1. N. Krishna Raju.Prestressed Concrete, Tata McGraw Hill Publications.
2. Ramamrutham. Prestressed Concrete, Dhanpatrai Publications

Reference Books:

1. T.Y. Lin & Ned H.Burns. Design of Prestressed concrete structures (Third Edition), John Wiley&Sons.Newyork
2. Praveen Nagrajan, Prestressed Concrete design, Pearson publications, 2013 editions.

Codes/Tables:

Codes: IS code for pre-stressed concrete (IS- 1343-2012).

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	--	--	--	--	--	--	--	--	2	--	--
CO2	3	2	3	2	--	--	--	1	--	--	--	--	2	--	--
CO3	2	1	3	2	--	--	--	--	--	--	--	--	2	--	--
CO4	2	1	--	2	--	--	--	1	--	--	--	1	2	--	--
CO5	2	1	3	2	--	--	--	--	--	--	--	--	2	--	--

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L	T	P	C
3	1	0	3

14ACE43 REMOTE SENSING AND GIS
(CBCC Dept. Specific - II)

Course Outcomes: After completion of the course the Students will be able to

1. Apply remote sensing techniques in the survey of the field
2. Analyze aerial photographs and GIS in spatial analysis
3. Identify the ways in which GIS can facilitate more effective and/or more efficient water resource Management
4. Analyze GIS spatial methods

UNIT I

REMOTE SENSING: Basic concepts and foundation of remote sensing – elements involved in remote sensing, electromagnetic spectrum, remote sensing terminology and units. Energy resources, energy interactions with earth surface features and atmosphere, resolution, sensors and satellite visual interpretation techniques, basic elements, converging evidence, interpretation for terrain evaluation, spectral properties of water bodies, introduction to digital data analysis.

UNIT II

INTRODUCTION TO PHOTOGRAMMETRY: Principles& types of aerial photograph, geometry of vertical aerial photograph, Scale &Height measurement on single vertical aerial photograph, Height measurement based on relief displacement, Fundamentals of stereoscopy, fiducially points, parallax measurement using fiducially line.

UNIT III

GEOGRAPHIC INFORMATION SYSTEM: Introduction, GIS definition and terminology, GIS categories, components of GIS, fundamental operations of GIS, A theoretical framework for GIS.

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

UNIT IV

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

UNIT V

WATER RESOURCES APPLICATIONS: Land use/Land cover in water resources, Surface water mapping and inventory, Rainfall – Runoff relations and runoff potential indices of watersheds, Flood and Drought impact assessment and monitoring, Watershed management for sustainable development and Watershed characteristics. Reservoir sedimentation, Fluvial Geomorphology, water resources management and monitoring, Ground Water Targeting, Identification of sites for artificial Recharge structures, Drainage Morphometry, Inland water quality survey and management, water depth estimation and bathymetry.

Text Books:

1. B.Bhatta. Remote Sensing and GIS, Oxford University Press, New Delhi.
2. SatheeshGopi. Advanced surveying: Total station GIS and remote sensing– Pearson Publication, New Delhi.

Reference Books:

1. Gorge Joseph. Fundamentals of remote sensing, Universities press, Hyderabad.
2. S.Kumar. Basics of Remote sensing & GIS, Laxmi Publications, New Delhi.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		--	--	--	--	--	--	--	--	--	--	2	3	--
CO2	3	3	--	2	1	--	--	--	--	--	--	--	2	3	--
CO3	3	3	--	--	2	--	--	--	--	--	--	--	2	3	--
CO4	3	3	--	3	2	1	1	--	3	3	--	2	2	3	--

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3	1	0	3

14ACE44 **TRAFFIC ENGINEERING**
(CBCC Dept. Specific - III)

Course Outcomes: After completion of the course the Students will be able to

1. Conduct traffic studies
2. Estimate the congestion in an area and also to design parking facility
3. Design intersections and prepare traffic management plans.
4. Identify the type of provision of various traffic and road indicators.
5. Evaluate traffic impacts on the environment and safety.

UNIT-I

TRAFFIC CHARACTERISTICS: Basic characteristics of Traffic – Volume, Speed and Density – Relationship among Traffic parameters.

TRAFFIC MEASUREMENT: Traffic Volume studies – objectives – types of Volume studies – concepts of PCU – data collection and presentation – Speed studies – Types of Speed studies - Objectives of Speed studies – methods of conducting Speed studies – data collection and presentation – Statistical methods for analysis of Speed data.

UNIT-II

HIGHWAY CAPACITY: Definition of Capacity – importance of capacity – factors affecting capacity- concept of level of service – different levels of service – concept of service volume – Peak Hour factor.

PARKING STUDIES: Types of parking facilities – On-street and Off-street parking facilities – Parking studies – Parking Inventory Study – Parking survey by Patrolling method – analysis of parking data and parking characteristics – Multi story car parking facility – Design standards.

UNIT-III

TRAFFIC CONTROL & REGULATION: Traffic problems in urban areas – importance of traffic control and regulation – Traffic regulatory measures – Channelization – Traffic signals – Saturation flow – Signal design by Webster method – Signal phasing and Timing diagrams.

UNIT-IV

TRAFFIC &ENVIRONMENT: Detrimental effect of traffic on Environment – Air Pollution – Pollution – Pollutants due to traffic – Measures to reduce Air Pollution due to traffic – Noise Pollution – Measures to reduce Noise Pollution.

TRAFFIC SIGNS AND ROAD MARGINS: Types of traffic signs – cautionary, regulatory and informative signs – Specifications – Pavement markings – Types of Markings – Lane markings and object markings – Standard and Specifications for Road markings.

UNIT-V

HIGHWAY SAFETY: Problem of Highway Safety – Types of Road accidents – Causes – Engineering Measures to reduce accidents – Enforcement measures – Educational measures – Road safety Audit – Principles of Road Safety Audit.

Text Books:

1. Nicholas J.Garber, Lester A.Hoel. Principles of Traffic & Highway Engineering. 1st Edition, Cengage Learning, 2010.
2. Dr. L.R Kadiyali. Traffic Engineering & Transportation Engineering. 6th Edition, Khanna Publishers, 1997.

Reference Books:

1. S.K.Khanna, C.E.G Justo. Highway Engineering. 9th Edition, Nemchand& Bros, 2011
2. Dr. S.K. Sharma. Principles,Practice& Design of Highway Engineering including Airport Pavements. S Chand and Company, 2012.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	--	--	--	--	--	--	--	--	--	2	1	
CO2	3	3	--	3	--	--	--	--	--	--	--	--	3	3	
CO3	3	2	--	--	--	--	--	--	--	--	--	--	2	3	
CO4	2	3	--	3	--	--	--	--	--	--	--	--	2	2	
CO5	1	2	1	--	--	--	--	--	--	--	--	--	3	3	

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3	1	0	3

14ACE45 URBAN AND REGIONAL PLANNING
(CBCC Dept. Specific - IV)

Course Outcomes: After completion of the course the Students will be able to

1. Understand considerations and principles of urban and regional planning
2. Develop policies and strategies for development, plan for sustainable development
3. Apply sustainability concept in construction of urban areas
4. Implement conservation measures for care of future generations in planning
5. Apply principles of economic and financial evaluation techniques

UNIT-I

URBAN AND REGIONAL PLANNING PRINCIPLES AND CONSIDERATIONS: Urban structure; Urban typology, density and sustainability - spatial types and morphologies related to intensity of use, consumption of resources and production and maintenance of viable communities; Accessibility –ease, safety and choice when moving to and through places; Legibility and way finding; Designing places to stimulate public activity; Function and fit; Complementary mixed uses- constructive interaction; Character and meaning; Order and incident; Continuity and change in time and place, contemporary culture; Civil society- building social capital

UNIT-II

URBAN DEVELOPMENT POLICIES AND STRATEGIES: Definition and classification of urban areas - Trend of urbanization - District, state, national and international urbanization levels - Impact on regional and national development - Social systems and its impact on urban planning - Slums in Indian cities - Indicators of urbanization - Historical development of urban settlements - Impact of technology on urban settlements - National policies related to urban development.

PLANNING PROCESS - urban and regional plans Goals, objectives, and strategies – Planning process - Delineation of planning areas - Different types of plans - Regional plan - Master plan - Structure plan - Detailed development plan - Preparation of plans - Surveys and analysis

UNIT-III

PRINCIPLES OF SUSTAINABLE DEVELOPMENT: Formulation of sectorial projects - Sites and services - Neighborhoods - regional planning

LAND USE PLANNING- land use and its interaction - Residential planning - importance of housing - Industrial and commercial land use - community facilities - educational system - recreational system - utility system - public buildings - Urban renewal and their application - community improvement - Slum improvement programs - Preparation of profile - Preparation of action plans.

UNIT-IV

PLAN EVALUATION: Principles of economic and financial evaluation techniques - cost benefit studies - Cash flow analysis.

PLAN IMPLEMENTATION INSTITUTIONAL ARRANGEMENT- Financing - Public, private, nongovernmental organizations and community collaboration - Subsidy - Recovery - Replicability - Development control regulations - Planning and building construction permission - Development charges - Town and Country Planning Act - building bye-laws.

UNIT-V

ECONOMICS: Introduction, Definition & scope of economics in Urban Planning, Regional planning macro and micro economics. Planning need, issues and five year plans, Economic uplift, backwardness, Poverty alleviation; Sustainable development, conservation measures, reduce recycle, reuse concept, care for future generation, carrying capacity and limits, study of water as a resource

TEXT BOOKS:

1. Kadiyali, L.K. Traffic Engineering and Transportation planning. Khanna publishers
2. Hiraskar,G.K., Fundamentals of Town Planning, Dhanpat Rai Publications, 1992.

References:

1. Hutchinson, B.G., Principles of Urban Transport Systems Planning, Scripta, McGraw Hill, New York, 1974.
2. Claire, Hand Book of Urban Planning, Van Nostrand Book Company, 1974.

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3				--	--	--	--	--	--	--	--	2	2	--
CO2	3					--	--	--	--	--	--	--	2	2	--
CO3	2					--	--	--	--	2	--	--	2	2	--
CO4	2	1			--			--	--	--	--	--	2	2	--
CO5	3		--		2	--	--	--	--	3	--	--	2	2	--

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3	1	0	3

14ACE46 REPAIR AND REHABILITATION OF STRUCTURES
(CBCC Dept. Specific - V)

Courses Outcomes: After completion of the course the Students will be able to

1. Evaluate strength and materials deficiency in concrete structure.
2. Apply methods and techniques used in repairing / strengthening existing concrete structures.
3. Apply non-destructive testing techniques to field problems.
4. Apply cost effective retrofitting strategies for repairs in buildings.
5. Judge the health condition of structures.

UNIT I: Introduction – Deterioration of Structures – Distress in Structures – Causes and Prevention mechanism of Damage – Types of Damage

UNIT II: Corrosion of Steel Reinforcement – Causes – Mechanism and Prevention. Damage of Structures due to Fire – Fire Rating of Structures – Phenomena of Desiccation.

UNIT III: Inspection and Testing – Symptoms and Diagnosis of Distress – Damage assessment – NDT.

UNIT IV: Repair of Structure – Common Types of Repairs – Repair in Concrete Structures – Repairs in Under Water Structures – Guniting – Shot Create – Underpinning. Strengthening of Structures –Strengthening Methods – Retrofitting – Jacketing.

UNIT V: Health Monitoring of Structures – Use of Sensors – Building Instrumentation.

Text Books:

1. Diagnosis and treatment of Structures in Distress – R N Raikar.
2. A.R. Santakumar. Concrete Technology, Oxford University press
3. B.L. Gupta and Amit Gupta.Maintenance and Repair of Civil Structures, Standard Publications**.**

Reference Books:

1. Bungey. Non-Destructive Evaluation of Concrete Structures– Surrey University Press, Hyderbad
2. EF & N Spon. Building Failures: Diagnosis and Avoidance, London, B.A.Richardson (1991), London

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO3
CO1		2											2		--
CO2													2		--
CO3	3				2								2		--
CO4	3												2		--
CO5		2											2		--

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L	T	P	C
3	1	0	3

14ACE47 CONSTRUCTION TECHNOLOGY AND PROJECT MANAGEMENT
(CBCC Dept. Specific - VI)

Course Outcomes: After completion of the course the Students will be able to

1. Describe concepts involved in construction technology and preparatory work and implementation.
2. Apply earthwork and various methods & concepts in excavation with special reference to blasting.
3. Apply management techniques for the development of personal, interpersonal and project management skills.
4. Estimate economic, resource management within which the Construction Project takes place with special reference to PERT.
5. Apply PERT/CPM for project Scheduling and in-time computation.

UNIT- I

FUNDAMENTALS OF CONSTRUCTION TECHNOLOGY: Definitions and Discussion – Construction Activities – Construction Processes - Construction Works – Construction Estimating – Construction Schedule – Productivity and Mechanized Construction – Construction Documents – Construction Records – Quality – Safety – Codes and Regulations.

PREPARATORY WORK AND IMPLEMENTATION: Site layout – Infrastructure Development – Construction Methods – Construction Materials – Deployment of Construction Equipment – Prefabrication in Construction – False work and Temporary Works.

UNIT- II

EARTHWORK: Classification of Soils – Project Site – Development – Setting Out - Mechanized Excavation – Groundwater Control – Trenchless (No-dig) Technology

EXCAVATION BY BLASTING: Rock Excavation – Basic Mechanics of Breakage – Blasting Theory – Kinds of Drilling – Selection of the Drilling Method and Equipment –Blasting Patterns and Firing Sequence – Smooth Blasting – Environmental Effect of Blasting.

UNIT- III

PROJECT MANAGEMENT AND BAR CHARTS AND MILESTONE CHARTS: Introduction – Project planning – Scheduling – Controlling – Role of decision in project management – Techniques for analyzing alternatives Operation research – Methods of planning and

programming problems – Development of bar chart – Illustrative examples – Shortcomings of bar charts and remedial measures – Milestone charts – Development of PERT network problems.

ELEMENTS OF NETWORK AND DEVELOPMENT OF NETWORK: Introduction – Event – Activity – Dummy – Network rules – Graphical guidelines for network – Common partial situations in network – Numbering the events – Cycles Problems – Planning for network construction – Modes of network construction – Steps in development of network – Work breakdown structure –Hierarchies – Illustrative examples – Problems.

UNIT- IV

PERTTIME ESTIMATES & TIME COMPUTATIONS: Introduction – Uncertainties: Use of PERT – Time estimates – Frequency distribution – Mean, variance and standard deviation – Probability distribution – Beta distribution – Expected time Problems -Earliest expected time – Formulation for T_E - Latest allowable occurrence time – Formulation for T_L - Combined tabular computations for T_E and T_L problems.

UNIT- V

PERT AND CPM: NETWORK ANALYSIS: Introduction - Slack – Critical path – Illustrative examples – Probability of meeting scheduled date Problems – CPM : process – CPM : Networks – Activity time estimate – Earliest event time – Latest allowable occurrence time – Combined tabular computations for T_E and T_L - Start and finish times of activity – Float – Critical activities and critical path – Illustrative examples Problems.

Text Books:

1. SubhirK.Sarkar and Saraswathi. Construction Technology. Delhi: Oxford Higher Education- Univ. Press
2. Construction project management. By Jha, Pearson Publications., New Delhi.

References:

1. Punmia, B.C. and K.K.Khandelwal. Project Planning and Control with PERT and CPM. New Delhi: Lakshmi Publications.
2. Seetharaman, S., Construction engineering and management, 3rd edition, Umesh Publications, New Delhi, 2010. Chudly, R., Construction Technology- Vol.I and II, 4th edition,

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	--	--	--	--	--	--	--	--	--	--	--	2	--	--
CO2		2	3		--	--	--	--	--	--	--	--	2	--	--
CO3	--	--	--	--	--	--	--	--	--	--	--	1	2	--	--
CO4	2	--	--	--	--			--	--	--	--	1	2	--	--
CO5		2	3	--	--	--	--	--	--	--	--	--	2	--	--

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0	0	3	2

14ACE48 COMPUTER AIDED DESIGN LAB

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

1. Develop computing skills in using software.
2. Analyze and design reinforced concrete structures like frames, slabs and columns.
3. Analyze and design steel structures like trusses and communication towers etc.
4. Plan and design any given building plan.

SOFTWARE:

1. STAAD PRO or Equivalent

EXCERCISES:

1. 2-D Frame Analysis and Design
2. Steel Tabular Truss Analysis and Design
3. 3-D Frame Analysis and Design
4. Retaining Wall Analysis and Design
5. Simple tower Analysis and Design
6. One Way Slab Analysis & Design
7. Two Way Slab Analysis & Design
8. Column Analysis & Design

Text Books:

1. Sesha Prakash, M.N. and C.S. Suresh.Computer Aided Design Lab Manual.

CO PO MAPPING															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	-	3	3	-	-	-	-	-	-	-	2	2	-
CO2	2	2	-	3	3	-	-	-	-	-	-	-	2	2	-
CO3	2	2	-	3	3	-	-	-	-	-	-	-	2	2	-
CO4	2	2	-	3	3	-	-	-	-	-	-	-	2	2	-
CO5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
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IV B.Tech – I Semester CE

L	T	P	C
0	0	3	2

14ACE49 **GIS LAB.**

Course Outcomes: After completion of the course the Students will be able to

1. Analyse the basic components of GIS
2. Classify the maps, coordinate systems and projections
3. use spatial and attribute data to prepare thematic maps
4. Identify and rectify mapping inaccuracies
5. Formulate and solve geospatial problems

SOFTWARE:

1. Arc GIS 10.1
2. ERDAS
3. Mapinfo

Any one or Equivalent

EXERCISIES:

1. Digitization of Points and Lines
2. Editing Map Elements
3. Attribute Data Entry and Manipulation
4. Cleaning, Building and Transformation
5. Data Analysis –Overlay, Buffer
6. Map Generation with Patterns and Legends
7. Buffer AnalysisNetwork Analysis

Reading:

1. ArcGIS 10.1 user manuals, 2013
2. ERDAS Imagine 2013 user manual

EXCERCISES:

1. Digitization of Map/ Toposheet
2. Creation of Thematic Maps
3. Study of Features Estimation
4. Developing Digital Elevation Model

5. Simple Applications of GIS in Water Resources Engineering and Transportation Engineering

Text Books:

1. C.P.L.O. Albert, K.W. Yong,Concept and Techniques of GIS,Printice Hall Publishers.

CO PO MAPPING															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	1	3	-	-	-	-	-	-	-	3	1	-
CO2	3	-	-	1	3	-	-	-	-	-	-	-	3	1	-
CO3	3	-	-	1	3	-	-	-	-	-	-	-	3	1	-
CO4	3	-	-	1	3	-	-	-	-	-	-	-	3	1	-
CO5	3	-	-	1	3	-	-	-	-	-	-	-	3	1	-

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(AUTONOMOUS)

14AMB02 PROFESSIONAL ETHICS

L	T	P	C
3	1	0	4

Outcomes:

After the completion of the course the students shall be able to

1. Understand human values and ethical standards to lead career accordingly.
2. apply appropriate safety measures in designing systems.
3. Demonstrate role of "responsible engineer" in the society.
4. Use natural resources in a sustainable manner and be conscious of environment.
5. Implement safety measures in engineering and product design aspects.

Unit-I Introduction

Professionalism-models of professionalism-Ethics-Types of ethics and morality-Engineering ethics-Positive and negative faces of ethics-Responsibility for safety-Technology pessimism and perils of technological optimism.

Unit-II Ethical Concepts

Human Values – morals-integrity-work ethics-Respect for others-respect for authority-conflicts of interests-moral dilemmas-honesty- courage-cooperation-valuing time-commitment-collegiality-loyalty-self -interest-Professional accountability-royalty-Problem of bribery, extortion and grease payments-problem of nepotism, excessive gifts-confidentiality-uses of ethical theories-Kohlberg's Theory- Gilligan`s Theory-Ethical codes of IEEE and Institution of Engineers –

Unit III Engineers Role in Safety

Safety and risks-risk and costs-risk benefit analysis-Testing methods for safety-The promise of technology-Computer Technology Privacy-Social policy-Engineering standards-the standards care-Social and value dimensions of technology-communicating risk and public policy-occupational crime-professional rights and employee rights-whistle blowing`

Unit IV Roles of Engineers

Engineers as managers, Advisors, Consultants, Experts and witnesses- Engineers role in industry and society- models of professional roles-Theories about right action-paternalism-different business practices-Moral leadership- Cases - Bhopal gas tragedy, Nuclear power plant disasters-

Unit V Environmental Ethics

Global Issues-Multinational corporations-Living in harmony with NATURE-Holistic technology-Eco friendly production system-sustainable technology and development-weapon development-Four orders of living, their interconnectedness-Eco system-Ozone depletion-,pollution

Text Books

1. Subramanian R, Professional Ethics,1st Edition, Oxford University Press. 2013.
2. Nagarajan , R.S., A Textbook on Professional Ethics and Human Values,1st edition, New Age International (P) Limited, Publishers New Delhi..2014

Reference Books

1. Fundamentals of Ethics for scientists and Engineers, Edmond G Seebauer and Robert L. Barry, 1st edition Oxford University Press, 2008.
2. R. R. Gaur, R. Sangal and G. P. Bagaria, Human Values and Professional Ethics:,EecelBooks,New Delhi.2010.
3. Professional Ethics and Human Values – M.Govindrajan, Natarajan and V.S. Senthil Kumar, PHI Learning Pvt. Ltd. Delhi.
4. Professional Ethics and Human Values: Prof. D.R. Kiran, TATA McGraw Hill Education.2007
5. Charles D Fleddermann, “Engineering Ethics”, Prentice Hall.
6. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning

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