

Annexure - III

GITAM UNIVERSTIY

(Declared as Deemed to be University U/S 3 of UGC Act, 1956)



REGULATIONS & SYLLABUS

Of

B.Tech. (Civil Engineering)

(W.e.f 2012-13 admitted batch)

Programme Code : **EURCE200801**

Gandhi Nagar Campus, Rushikonda

VISAKHAPATNAM – 530 045

Website: www.gitam.edu

REGULATIONS

(W.e.f. 2012-013 admitted batch)

1.0 ADMISSIONS

- 1.1 Admissions into B.Tech (Civil Engineering) programme of GITAM University are governed by GITAM University admission regulations.

2.0 ELIGIBILITY CRITERIA

- 2.1 A pass in 10+2 or equivalent examination approved by GITAM University with Physics, Chemistry and Mathematics.
- 2.2 Admissions into B.Tech will be based on an All India Entrance Test (GAT) conducted by GITAM University and the rule of reservation, wherever applicable.

3.0 STRUCTURE OF THE B.Tech. PROGRAMME

- 3.1 The Programme of instruction consists of:
- (i) A general core programme comprising Basic Sciences, Basic Engineering, Humanities & Social Sciences and Mathematics.
 - (ii) An engineering core programme imparting to the student the fundamentals of engineering in the branch concerned.
 - (iii) An elective programme enabling the students to take up a group of departmental / interdepartmental courses of interest to him/her.

In addition, a student has to

- (i) carry out a technical project approved by the department and submit a report.
 - (ii) undergo summer training in an industry for a period prescribed by the department and submit a report.
- 3.2 Each academic year consists of two semesters. Every branch of the B.Tech programme has a curriculum and course content (syllabi) for the courses recommended by the Board of Studies concerned and approved by Academic Council.

4.0 CREDIT BASED SYSTEM

- 4.1 Each course is assigned certain number of credits which will depend upon the number of contact hours (lectures & tutorials) per week.
- 4.2 In general, credits are assigned to the courses based on the following contact hours per week per semester.
- One credit for each Lecture / Tutorial hour.
One credit for two hours of Practicals.
Two credits for three (or more) hours of Practicals.
- 4.3 The curriculum of B.Tech programme is designed to have a total of 190 to 200 credits for the award of B.Tech degree.
- 4.4 Every course of the B Tech programme will be placed in one of the nine groups of courses with minimum credits as listed in the Table 1.

4.5 - Table 1: Group of Courses

S.No	Group of Courses	Code	Minimum credits
1	Humanities & Social Sciences	HS	12
2	Basic Sciences	BS	17
3	Mathematics	MT	10
4	Basic Engineering	BE	26
5	Core Engineering	CE	68
6	Departmental Elective	DE	9
7	Inter Departmental Elective	IE	8
8	Project Work	PW	8
9	Industrial Training	IT	2
Total			160

5.0 MEDIUM OF INSTRUCTION

The medium of instruction (including examinations and project reports) shall be English.

6.0 REGISTRATION

Every student has to register himself/herself for each semester individually at the time specified by the Institute / University.

7.0 CONTINUOUS ASSESSMENT AND EXAMINATIONS

7.1 The assessment of the student's performance in each course will be based on continuous internal evaluation and semester-end examination. The marks for each of the component of assessment are fixed as shown in the Table 2.

Table 2: Assessment Procedure

S.No.	Component of assessment	Marks allotted	Type of Assessment	Scheme of Examination
1	Theory	40	Continuous evaluation	1. Best two mid examinations of the three mid examinations for 15 marks each for a total of 30 marks 2. Remaining 10 marks are given by the teacher by conducting quiz / assignments / surprises tests etc.
		60	Semester-end examination	The semester-end examination in theory courses will be for a maximum of 60 marks.
	Total	100		
2	Practicals	100	Continuous evaluation	(i) 40 marks are allotted for record work and regular performance of the student in the lab. (ii) One examination for a maximum of 20 marks shall be conducted by the teacher handling the lab course at the middle of the semester (iii) One examination for a maximum of 40 marks shall be conducted at the end of the semester (as scheduled by the Head of the Department concerned).
				(i) 50 marks are allotted for continuous evaluation of the project work throughout the semester by the guide.

3	Project work (VII & Eighth Semester)	100	Project evaluation	(ii) 50 marks are allotted for the presentation of the project work & viva-voce at the end of the semester.*
4	Industrial Training (Seventh Semester)	100	Industrial training evaluation	(i) 50 marks are allotted for report submission and seminar presentations after completion of the training. (ii) 50 marks are allotted for the viva-voce at the end of the semester.*
5	Comprehensive Viva (Eighth Semester)	100	Viva-voce	100 marks are allotted for comprehensive viva to be conducted at the end of programme.*

* Head of the Department concerned shall appoint two examiners for conduct of the examination.

8.0 RETOTALLING, REVALUATION & REAPPEARANCE

- 8.1 Retotalling of the theory answer script of the end-semester examination is permitted on a request made by the student by paying the prescribed fee within ten days of the announcement of the result.
- 8.2 Revaluation of the theory answer script of the end-semester examination is also permitted on a request made by the student by paying the prescribed fee within fifteen days of the announcement of the result.
- 8.3 A Student who has secured 'F' Grade in any theory course / Practicals of any semester shall have to reappear for the semester end examination of that course / Practicals along with his / her juniors.
- 8.4 A student who has secured 'F' Grade in Project work / Industrial Training shall have to improve his report and reappear for viva – voce Examination of project work at the time of special examination to be conducted in the summer vacation after the last academic year.

9.0 SPECIAL EXAMINATION

- 9.1 A student who has completed the stipulated period of study for the degree programme concerned and still having failure grade ('F') in not more than 5 courses (Theory / Practicals), may be permitted to appear for the special examination, which shall be conducted in the summer vacation at the end of the last academic year.
- 9.2 A student having 'F' Grade in more than 5 courses (Theory/practicals) shall not be permitted to appear for the special examination.

10.0 ATTENDANCE REQUIREMENTS

- 10.1 A student whose attendance is less than 75% in all the courses put together in any semester will not be permitted to attend the end - semester examination and he/she will not be allowed to register for subsequent semester of study. He /She has to repeat the semester along with his / her juniors.
- 10.2 However, the Vice Chancellor on the recommendation of the Principal / Director of the University College / Institute may condone the shortage of attendance to the students whose attendance is between 66% and 74% on genuine medical grounds and on payment of prescribed fee.

11.0 GRADING SYSTEM

- 11.1 Based on the student performance during a given semester, a final letter grade will be awarded at the end of the semester in each course. The letter grades and the corresponding grade points are as given in Table 3.

Table 3: Grades & Grade Points

Grade	Grade points	Absolute Marks
O	10	90 and above
A+	9	80 – 89
A	8	70 – 79
B+	7	60 – 69
B	6	50 – 59
C	5	40 – 49
F	Failed, 0	Less than 40

- 11.2 A student who earns a minimum of 5 grade points (C grade) in a course is declared to have successfully completed the course, and is deemed to have earned the credits assigned to that course. However, a minimum of 24 marks is to be secured at the semester end examination of theory courses in order to pass in the theory course.

12.0 GRADE POINT AVERAGE

- 12.1 A Grade Point Average (GPA) for the semester will be calculated according to the formula:

$$\text{GPA} = \frac{[C \times G]}{C}$$

Where

C = number of credits for the course,
G = grade points obtained by the student in the course.

- 12.2 Semester Grade Point Average (SGPA) is awarded to those candidates who pass in all the courses of the semester.
- 12.3 To arrive at Cumulative Grade Point Average (CGPA), a similar formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time.
- 12.4 The requirement of CGPA for a student to be declared to have passed on successful completion of the B.Tech programme and for the declaration of the class is as shown in Table 4.

Table 4: CGPA required for award of Degree

Distinction	8.0*
First Class	7.0
Second Class	6.0
Pass	5.0

* In addition to the required CGPA of 8.0, the student must have necessarily passed all the courses of every semester in **first attempt**.

13.0 ELIGIBILITY FOR AWARD OF THE B.TECH DEGREE**13.1 Duration of the programme:**

A student is ordinarily expected to complete the B Tech. programme in eight semesters of four years. However a student may complete the programme in not more than six years including study period.

13.2 However the above regulation may be relaxed by the Vice Chancellor in individual cases for cogent and sufficient reasons.

13.3 A student shall be eligible for award of the B.Tech degree if he / she fulfils all the following conditions.

- a) Registered and successfully completed all the courses and projects.
- b) Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of his/her study within the stipulated time.
- c) Has no dues to the Institute, hostels, Libraries, NCC / NSS etc, and
- d) No disciplinary action is pending against him / her.

13.4 The degree shall be awarded after approval by the Academic Council.

RULES

1. With regard to the conduct of the end-semester examination in any of the practical courses of the programme, the Head of the Department concerned shall appoint one examiner from the department not connected with the conduct of regular laboratory work, in addition to the teacher who handled the laboratory work during the semester.
2. In respect of all theory examinations, the paper setting shall be done by an external paper setter having a minimum of three years of teaching experience. The panel of paper setters for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council. The paper setters are to be appointed by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations.
3. The theory papers of end-semester examination will be evaluated by internal/external examiner.
4. Panel of examiners of evaluation for each course is to be prepared by the Board of Studies of the department concerned and approved by the Academic Council.
5. The examiner for evaluation should possess post graduate qualification and a minimum of three years teaching experience.
6. The appointment of examiners for evaluation of theory papers will be done by the Vice Chancellor on the basis of recommendation of Director of Evaluation / Controller of Examinations from a panel of examiners approved by the Academic Council.

SYLLABUS Programme Code: EURCE200801
B.Tech. (Civil) First Semester

Sl. No.	Course Code	Name of the Course	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
				Hours per week		Duration in Hrs.	Maximum Marks		
				L/T	D/P		Sem. End Exam	Con. Eval	
1	EUREG 101	Engg. English – I	HS	3	---	3	60	40	3
2	EURMT 102	Engg. Mathematics	MT	4	---	3	60	40	4
3	EURPH 103	Engg. Physics - I	BS	4	---	3	60	40	4
4	EURCH 104	Engg. Chemistry – I	BS	4	---	3	60	40	4
5	EURCS 105	Programming with C	BE	3	---	3	60	40	3
6	EURME 106/205	Engineering Drawing	BE	2	3	3	60	40	3
PRACTICALS :									
	EURIE 111/211	Workshop practice	BE	---	3	3	40	60	2
	EURPH 112/212	Engg. Physics Lab	BS	---	4	3	40	60	2
	EURCS 113	Programming with C Lab	BE	---	3	3	40	60	2
		Total:		20	13	---	480	420	27

B.Tech. (Civil) Second Semester

Sl. No.	Course Code	Name of the Course	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
				Hours per week		Duration in Hrs.	Maximum Marks		
				L/T	D/P		Sem. End Exam	Con Eval	
1	EUREG 201	Engg. English – II	HS	3	---	3	60	40	3
2	EURMT 202	Higher Engineering Mathematics – I	MT	3	---	3	60	40	3
3	EURMT 203	Higher Engineering Mathematics – II	MT	3	---	3	60	40	3
4	EURPH 204	Engg. Physics - II	BS	3	---	3	60	40	3
5	EURCH 205	Engg. Chemistry – II	BS	3	---	3	60	40	3
6	EURCS 206	Object Oriented programming with C++	BE	3	---	3	60	40	3
DRAWING / PRACTICALS :									
	EURCS 213	Objected oriented programming with C++ Lab	BE	---	3	3	40	60	2
	EURCH 214/114	Engg. Chemistry Lab	BS	---	3	3	40	60	2
	EURME 215/115	Engineering Graphics Practice	BE	---	4	3	40	60	2
		Total		18	10	---	480	420	24

**B.Tech. (CE)
III SEMESTER**

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 301	Engineering Mechanics- Statics and Dynamics	BE	4	60	40	100	4			4
EURCE 302	Mechanics of Solids	BE	3	60	40	100	3	1		4
EURCE 303	Building Materials and Building Construction	CE	3	60	40	100	3			3
EURCE 304	Concrete Technology	CE	3	60	40	100	3			3
EURCE 305	Surveying	CE	4	60	40	100	3	1		4
EURCE 306	Engineering Geology	BS	3	60	40	100	3			3
EURCE 311	Concrete Laboratory	CE	2	40	60	100			3	3
EURCE 312	Survey Field Work	CE	2	40	60	100			3	3
EURCE 313	Engg Geology Laboratory	BS	2	40	60	100			3	3
TOTAL			26	480	420	900	19	2	9	30

IV SEMESTER

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 401	Environmental Studies	HS	4	60	40	100	4			4
EURCE 402	Structural Analysis-I	CE	3	60	40	100	3	1		4
EURCE 403	Building Planning and Drawing	CE	4	60	40	100	2		3	5
EURCE 404	Fluid Mechanics – I	BE	3	60	40	100	3	1		4
EURCE 405	Environmental Engineering-I	CE	3	60	40	100	3	1		4
EURCE 406	Higher Engineering Mathematics – III	MT	3	60	40	100	3	1		4
EURCE 411	Fluid Mechanics Laboratory-I	BE	2	40	60	100			3	3
EURCE 412	Environmental Engineering Laboratory-I	CE	2	40	60	100			3	3
EURCE 413	Strength of Materials Laboratory	CE	2	40	60	100			3	3
EURCE 414	* Industrial Tour	IT	0							
TOTAL			26	480	520	1000	18	4	12	34

* Local tours to Project sites in and around Visakhapatnam

V SEMESTER

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 501	Structural Analysis-II	CE	3	60	40	100	3	1		4
EURCE 502	Reinforced Concrete Structures-I	CE	3	60	40	100	3	1		4
EURCE 503	Steel Structures – I	CE	3	60	40	100	3	1		4
EURCE 504	Geo-technical Engineering- I	CE	3	60	40	100	3	1		4
EURCE 505	Fluid Mechanics – II	CE	3	60	40	100	3	1		4
EURCE 506	Environmental Engineering-II	CE	3	60	40	100	3	1		4
EURCE 511	Geo-technical Engineering Laboratory-I	CE	2	40	60	100			3	3
EURCE 512	Fluid Mechanics Laboratory-II	CE	2	40	60	100			3	3
EURCE 513	Environmental Engineering Laboratory-II	CE	2	40	60	100			3	3
EURCE 514	Advanced Communication Skills & English Language Lab	HS	2	--	100	100			3	3
	TOTAL		26	480	520	1000	18	6	12	36

VI SEMESTER

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 601	Reinforced Concrete Structures-II	CE	3	60	40	100	3	1		4
EURCE 602	Steel Structures – II	CE	3	60	40	100	3	1		4
EURCE 603	Geo-technical Engineering-II	CE	3	60	40	100	3	1		4
EURCE 604	Water Resource Engineering-I	CE	3	60	40	100	3	1		4
EURCE 605	Transportation Engineering-I	CE	3	60	40	100	3	1		4
EURCE 606	Project Estimation and Contracts	CE	3	60	40	100	3	1		4
EURCE 611	Survey Camp (one week in the month of Dec/Jan)	PW	2	50	50	100				-
EURCE 612	Geo-technical Engineering Laboratory-II	CE	2	40	60	100			3	3
EURCE 613	Transportation Engineering Laboratory-I	CE	2	40	60	100			3	3
EURCE 614	Personality Development	HS	0		-	-			3	3
	TOTAL		24	490	410	900	18	6	9	33

VII SEMESTER

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 701	Water Resources Engineering-II	CE	3	60	40	100	3	1		4
EURCE 702	Transportation Engineering-II	CE	3	60	40	100	3			3
EURCE 703	Construction Management	HS	3	60	40	100	3	1		4
EURCE 711	Computer Applications in Civil Engineering	CE	2	40	60	100	-	-	3	3
EURCE 712	Non Destructive Testing Laboratory	CE	2	40	60	100			3	3
EURCE 713	Transportation Engineering Laboratory-II	CE	2	40	60	100			3	3
EURCE 714	Project Work	PW	2	50	50	100			4	4
EURCE 715	Industrial Training (to be conducted after the third year second Semester for 6weeks)	IT	2	100	-	100				
EURCE 721-727	Departmental Elective-I	DE	4	60	40	100	3	1		4
	TOTAL		23	510	390	900	12	3	16	28

VIII SEMESTER

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 811	Project	PW	4	50	50	100			8	8
EURCE 831-836	Departmental Elective-II	DE	4	60	40	100	3	1		4
EURCE 841-846	Departmental Elective-III	DE	4	60	40	100	3	1		4
EURCE 8502 - 8516, 8518,8522,8524	Inter-Departmental Elective-I	IE	4	60	40	100	3	1		4
EURCE 8602-8609, 8611-8614, 8616-8619	Inter-Departmental Elective-II	IE	4	60	40	100	3	1		4
	TOTAL		20	290	210	500	12	4	8	24

- The distribution of 100 marks for Laboratory Examination is 40 for continuous assessment, 20 for Examination by the teacher at the middle of the semester, 40 for semester End Examination

$$\text{GRAND TOTAL} = 27 + 24 + 26 + 26 + 26 + 24 + 23 + 20 = 196$$

Interdepartmental Electives will be from other Departments. The list of courses that would be offered in any semester will be specified from which the students may select a course.

B.Tech. (CE)

ELECTIVES: CIVIL ENGINEERING

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 721-727	Departmental Elective – I	DE	4	40	60	100	3	1		4
721	Advanced Reinforced Concrete Structures-I									
722	Multistoreyed Structures									
723	Design of Bridges									
724	Design of Foundations for Dynamic Loading									
725	Hydraulic Structures									
726	Elements of Environmental Sanitation									
727	Environmental Impact Analysis									

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 831-836	Departmental Elective – II	DE	4	40	60	100	3	1		4
831	Industrial Structures									
832	Advanced Reinforced Concrete Structures-II									
833	Prestressed Concrete									
834	Ground Improvement Techniques									
835	Coastal Engineering									
836	Principles of Industrial Waste Treatment									

Course Code	Name of the Course	Category	Credits	Sem end Exam Marks	Continuous Evaluation Marks	Total Marks	Hours of Instruction per week			Total Hours
							L	T	L a b	
EURCE 841-846	Departmental Elective – III	DE	4	40	60	100	3	1		4
841	Finite Element Method									
842	Introduction to Earthquake Engineering									
843	Soil Dynamics and Machine Foundations									
844	Air Pollution and its Control									
845	Transportation Planning and Pavement Design									
846	Remote Sensing & Geographic Information Systems									

B.Tech. (CE)

INTER-DEPARTMENTAL ELECTIVE-I

Course Code	Name of the Course
EURCE 8502	Data Base management Systems
EURCE 8503	Software Engineering
EURCE 8504	Systems Modeling & Simulation
EURCE 8505	Software Project Management
EURCE 8506	Artificial Intelligence
EURCE 8507	Transducers & Signal Conditioning
EURCE 8508	Biomedical Instrumentation
EURCE 8509	Power Electronics
EURCE 8510	Project Planning and Management
EURCE 8511	Neural Networks
EURCE 8512	Introduction to Micro Electro Mechanical Systems(MEMS)
EURCE 8513	Entrepreneurship

EURCE 8514	Public Administration
EURCE 8515	Fundamental of Communication Engineering
EURCE 8516	Equipment for Construction Industry
EURCE 8518	Data structures with C++
EURCE 8522	Basic Electronics
EURCE 8524	Computer Organisation

INTER-DEPARTMENTAL ELECTIVE-II

Course Code	Name of the Course
EURCE 8602	Operating Systems
EURCE 8603	Web Technology
EURCE 8604	Industrial Electronics
EURCE 8605	Computer Aided Design
EURCE 8606	Robotics and Automation
EURCE 8607	Mechatronics
EURCE 8608	Education Research & Methodologies
EURCE 8609	Professional Ethics
EURCE 8611	Thermodynamics
EURCE 8612	Digital Signal Processing
EURCE 8613	Electronic Measurement & Instrumentation
EURCE 8614	Very Large Scale Integrated System Design (VLSI)
EURCE 8616	Engineering Materials
EURCE 8617	Computer Network
EURCE 8618	Micro Processor & Micro Controllers
EURCE 8619	Managerial & Engineering Economics

Group of Courses

S. No.	Group of Courses	Code	Minimum credits	Allotted credits from 2012-13 Batches
1	Humanities & Social Sciences	HS	12	15
2	Basic Sciences	BS	17	23
3	Mathematics	MT	10	13
4	Basic Engineering	BE	26	29
5	Core Engineering	CE	68	86
6	Departmental Elective	DE	9	12
7	Inter Departmental Elective	IE	8	8
8	Project Work	PW	8	8
9	Industrial Training	IT	2	2
Total			160	196

B.Tech. (Civil) First Semester**EUREG 101: ENGINEERING ENGLISH-I**

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EUREG 101	HS	4	---	3	60	40	3

Unit – I: Introduction to Communication

Role and Importance of Communication, Features of Human Communication
 Process of Communication, Types of Communication: Verbal and Non-Verbal
 Importance of Listening in Effective Communication, Barriers to Communication

Unit – II :Effective Vocabulary

Words Often Confused, One-word Substitutes, Idiomatic Usage, Using Dictionary and Thesaurus

Unit – III :Functional Grammar

Functions: Making proposals, Offering suggestions, Apologizing, Requesting, Offering and Refusing help, Giving and asking for information, Making complaints, Interrupting, Giving and asking directions, Inviting, Asking Permission, Expressing ability, etc.,
 Articles, Prépositions, Tenses , Concord

Unit – IV: Communication through Writing

Paragraph writing
 Communication through letters: official and personal letters, letters of complaint, letters of enquiry and responses.
 Résumé writing, Cover letters, E-mail etiquette, Punctuation

Unit – V: Reading for Enrichment

Sachin Tendulkar, Michael Jackson

Prescribed Book:

1. E. Suresh Kumar et al., **Enriching Speaking and Writing Skills**, Orient Blackswan, 2012.

Reference Books:

1. E. Suresh Kumar et al., **Communication Skills and Soft Skills**, Pearson, 2010.
2. Jayashree Mohanraj et al., **Speak Well**, Orient Black Swan, 2011.
3. **Oxford Advanced Learners' Dictionary**, 2010 Edition.

B.Tech. (Civil) First Semester**EURMT 102: ENGINEERING MATHEMATICS**

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be Awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EURMT 102	MT	4	---	3	60	40	4

Unit-I: First order Differential Equations

(10)

Formation – Variables separable – Homogeneous, non Homogeneous, Linear and Bernoulli equations. Exact equations - Applications of first order differential equations – Orthogonal Trajectories, Newton’s law of cooling, law of natural growth and decay.

Unit-II: Higher order Differential Equations

(12)

Complete solutions - Rules for finding complementary function - Inverse operator - Rules for finding particular integral - Method of variation of parameters - Cauchy’s and Legendre’s linear equations - Simultaneous linear equations with constant coefficients - Applications of linear differential equations to Oscillatory Electrical circuits L-C, LCR – Circuits - Electromechanical Analogy.

Unit-III: Mean Value Theorems

(08)

Rolle’s, Lagrange’s and Cauchy’s mean value theorems. Taylor’s and Maclaurin’s theorems and applications (without proofs).

Unit-IV: Infinite Series

(12)

Definitions of convergence, divergence and oscillation of a series - General properties of series - Series of positive terms - Comparison tests - Integral test - D’ Alembert’s Ratio test - Raabe’s test - Cauchy’s root test - Alternating series - Leibnitz’s rule - Power series - Convergence of exponential, Logarithmic and binomial series (without proofs).

Unit-V: Linear Algebra

(12)

Rank of a Matrix – Elementary Transformations – Echelon form - Normal form (self study). Consistency of Linear system of equations $AX = B$ and $AX = 0$. Eigen Values and Eigen Vectors – Properties of eigen values (without proofs) – Cayley – Hamilton theorem (Statement only without proof) – Finding inverse and powers of a square matrix using Cayley – Hamilton theorem – Reduction to diagonal form – Quadratic form - Reduction of Quadratic form into canonical form – Nature of quadratic forms.

Text Books Prescribed:

- Higher Engineering Mathematics*, Dr.B.S Grewal. Khanna Publishers.
- Engineering Mathematics Vol.-I* Dr.T.K.V.Iyengar S.Chand.

References :

- Advanced Engineering Mathematics*, Erwin Kreyszig. Wiley Eastern Pvt. Ltd.
Textbook of Engineering Mathematics, N.P.Bali. Laxmi Publications (P) Ltd.
Higher Engineering Mathematics, Dr.M.K.Venkata Raman. National Pub. Co.
Calculus and Analytic Geometry Thomas / Finney Sixth edition -Narosa Publishing House

Note: The figures in parentheses indicate approximate number of expected hours of Instruction.

B.Tech. (Civil) First Semester
EURPH 103: ENGINEERING PHYSICS – I

Code No.	Category	Scheme of instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURPH 103	BS	4	---	3	60	40	4

The aim of the course is to impart knowledge in basic concepts of Physics relevant to Engineering applications.

UNIT - I (9 hours)

THERMODYNAMICS: Heat and Work - First Law of Thermodynamics and Applications - Reversible and Irreversible Processes - Carnot's Cycle and Efficiency - Second Law of Thermodynamics - Carnot's Theorem - Entropy - Entropy in Reversible and Irreversible Processes - Entropy and Second Law - Entropy and Disorder - Third Law of Thermodynamics.

UNIT - II (10 hours)

ELECTROMAGNETIC OSCILLATIONS AND ALTERNATING CURRENTS: Energy Stored in a Capacitor and an Inductor - LC Oscillations (Qualitative and Quantitative) - Analogy to Mechanical Motion-Damped Oscillations - Damped Oscillations in an RLC Circuit - Alternating Current (Including Equations for Voltages and Currents) - Fundamental Definitions - (Cycle, Time period, Frequency, Amplitude, Phase, Phase Difference, Root Mean Square (RMS) value, Average Value, Form Factor, Quality Factor, Power in Alternating Current Circuits) - Forced Oscillations and Resonance - The Series RLC Circuit.

ELECTROMAGNETIC WAVES: Induced Magnetic Fields - Displacement Current - Maxwell's Equations - Traveling Waves and Maxwell's Equations - The Poynting Vector - Light and the Electromagnetic Spectrum.

UNIT-III (8 hours)

DIELECTRIC PROPERTIES: Introduction - Fundamental Definitions - Local Field - Clausius-Mossotti Relation - Different Types of Electric Polarizations (electronic, ionic, and dipolar polarizations) - Frequency and Temperature Effects on Polarization - Dielectric Loss - Dielectric Breakdown - Determination of Dielectric Constant - Properties and Different Types of Insulating Materials - Ferroelectric Materials - Spontaneous Polarization in BaTiO₃ - Electrets.

UNIT-IV (8 hours)

MAGNETIC PROPERTIES: Introduction - Fundamental Definitions - Different Types of Magnetic Materials - Weiss Theory of Ferromagnetism - Domain Theory of Ferromagnetism – Hysteresis - Hard and Soft Magnetic Materials - Ferrites - Microwave Applications - Magnetic Bubbles.

UNIT-V (9 hours)

SUPERCONDUCTIVITY : Introduction - BCS Theory - Meissner Effect - Properties of Superconductors - Type-I and Type-II Superconductors - High T_c Superconductors - Applications.

ULTRASONICS: Introduction - Production of Ultrasonics by Magnetostriction and Piezo-electric Effects - Detection and Applications of Ultrasonics.

Prescribed Books :

Physics part I & II
Engineering Physics

Resnick, Halliday, Krane. John Wiley & Sons.
P.K.Palani samy. Scitech Publications (India) Pvt Ltd., Chennai

Reference Books:

Heat, Thermodynamics, and Statistical Physics
Solid State Physics
Materials Science
A Text Book of Engg. Physics
The Feynman Lectures on Physics

Agarwal, Singhal, Satya Prakash. Pragati Prakashan, Meerut.
S.O.Pillai. New Age International (P)Limited, New Delhi.
M. Arumugam. Anuradha Agencies, Kumbhakonam.
Kshirsagar & Avadhanulu. S.Chand and Co.
Addison-Wesley.

Note: The figures in parentheses indicate approximate number of expected hours of instruction.

EURCH 104: ENGINEERING CHEMISTRY-I

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCH 104	BS	4	---	3	60	40	4

Unit - I. WATER TECHNOLOGY - SOURCES AND PURIFICATION OF WATER: (8 hours)

Sources of Water – Impurities in Water- Hardness of Water – Temporary and Permanent.Hardness-Units. Municipal Water treatment- Sedimentation – Coagulation–Filtration-Sterilisation - Desalination of Brackish Water - Reverse Osmosis and Electro dialysis.

Unit - II. WATER TECHNOLOGY-SOFTENING METHODS AND BOILER TROUBLES:

(8 hours)

Industrial Water treatment- Lime - Soda Ash Method - Chemical reactions –Problems - Zeolite and Ion exchange processes. Boiler Troubles – Boiler corrosion- Scale and Sludge formation - Caustic Embrittlement-Priming and Foaming – Internal conditioning methods like – phosphate, carbonate conditioning.

Unit – III. SURFACE CHEMISTRY AND NANOCHEMISTRY:

(9 hours)

Colloids: Types of Colloids – Preparation of Colloidal solutions – Micelles – Applications of Colloids

Adsorption : Classification – Adsorption of Gasses on solids - Applications of Adsorption

Nanochemistry : Introduction – Wet chemical methods of preparation (Microemulsion – Solvent Extraction Reduction – Chemical Oxidation / Reduction).

Unit – IV. POLYMERS:

(9 hours)

Types of Polymerization– Mechanism of addition polymerization-Moulding constituents and Moulding techniques. Differences between Thermo Plastic and Thermosetting Resins. Preparation and Properties of Polyethylene, PVC, Polystyrene, Polyamides (Nylon-6:6), Polycarbonates and Bakelite - Engineering applications of Plastics, Poly Siloxanes, Polyphosphines.

Unit – V. ENGINEERING MATERIAL SCIENCE:

(11 hours)

Refractories:– Classification - criteria of a good refractory. Preparation and properties of silica, magnesite and silicon carbide refractories - clay bond, silica nitride bond and self bond in silicon carbide.

Glass: – Manufacture of glass – types of glasses- Soft glass – hard glass and pyrex glass.

Ceramics: – Structural clay products, white wares and Chemical stone wares.

Cement: Chemical composition of Portland cement, Manufacture- Setting and Hardening of Cement.

Text Books Prescribed:

<i>Engineering Chemistry,</i>	P.C. Jain and M. Jain.	Dhanapat Rai & Sons, Delhi.
<i>Engineering Chemistry,</i>	B.K.Sharma.	Krishna Prakashan,Meerut.
<i>A Textbook of Engineering Chemistry,</i>	Sashi Chawla.	Dhanapath Rai & Sons, Delhi.
<i>Text Book of NanoScience and NanoTechnology</i> , by B.S. Murthy and P.Shankar, University Press.		

Reference Books:

<i>A Textbook of Engineering Chemistry,</i>	S.S.Dara.	S.Chand & Co. New Delhi.
<i>Material Science and Engineering,</i>	V.Raghavan.	Prentice-Hall India Ltd.

B.Tech. (Civil) First Semester
EURCS 105: PROGRAMMING with C

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCS 105	BE	3	---	3	60	40	3

UNIT – I

(8 periods)

Algorithm, flowchart, program development steps, structure of C program, Compilers, Linker, Preprocessor, identifiers, basic data types and sizes, Constants, variables, operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Input-output statements, statements and blocks, programming examples.

UNIT – II

(8 periods)

Control Structures: if and switch statements, loops- while, do-while and for statements, break, continue, goto and labels.

Designing structured programs, Functions, basics, parameter passing, block structure, user defined functions, standard library functions, recursive functions, Comparison of Iteration and Recursion, header files, C preprocessor, storage classes- extern, auto, register, static, scope rules, example c programs.

UNIT – III

(8 periods)

Arrays: concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays.

Pointers: concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory management functions, command line arguments, c program examples.

UNIT – IV

(8 periods)

Strings: What are Strings, Arrays of Strings and Standard Library String Functions.

Derived types: structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bitfields, C program examples.

UNIT – V

(8 periods)

Input and output - concept of a file, File Structure, text files and binary files, streams, standard I/O, Formatted I/O, file I/O operations, error handling, C program examples.

Text Books:

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
2. MASTERING C, by K R Venugopal, S R Prasad published by Tata McGraw Hill.

Reference Books:

1. Programming with ANSI and Turbo C by Ashok N. Kamthane, published by PEARSON Education
2. Let us C by Yashwant Kanetkar, published by BPB Publications.

B.Tech. (Civil) First Semesters
EURME 106/205 ENGINEERING DRAWING

Category	Maximum marks			Periods				Credits
	Semester End Exam	Con. Eval	Total	Lectures	Tutorials	Practicals	Total	
BE	60	40	100	2	--	3	5	3

UNIT-I

Importance, Significance and scope of engineering drawing, Lettering, Dimensioning.

Geometrical Constructions: Introduction, bisecting a line, perpendiculars lines, parallel lines, divide a line, circle, bisect an angle, trisect an angle, center of an arc, construction of squares, regular polygons, regular polygons inscribed in circles, inscribed circles.

Engineering Curves: Introduction, Conic sections, ellipse, parabola, hyperbola, cycloidal curves, epicycloid and hypocycloid.

UNIT-II

Orthographic projections: Introduction, principle of projection, methods of projection, orthographic projection, planes of projection, first angle projection and third angle projection.

Projections of Points: Introduction, projections of points in different quadrants

UNIT-III

Projections of Straight lines: Introduction, line parallel to one or both the planes, line contained by one or both the planes, line perpendicular to one of the planes, line inclined to one plane and parallel to the other, line inclined to both the planes, traces, inclinations, and true lengths of the lines.

UNIT-IV

Projections of Planes: Introduction, types of planes, perpendicular planes, perpendicular to one pane and parallel to other plane, perpendicular to one plane and inclined to other plane, oblique planes.

Projections on auxiliary planes: types of auxiliary planes, perpendicular to one pane and parallel to other plane, perpendicular to one plane and inclined to other plane, oblique planes.

UNIT-V

Projections of Solids: Introduction, types of solids, polyhedral tetrahedron- prism, pyramid and solids of revolution- cylinder, cone. Projections of solids, simple positions, axis inclined to on plane and parallel to other, axis inclined to both the planes.

Text books:

1. Engineering Drawing by N.D. Bhatt and V. M .Panchal, Charotar publishing house Pvt. Ltd, 49th edition, 2008.
2. Engineering Drawing by M.B Shah and B.C Rana, Pearson Edn, 2nd edition, 2009

References:

1. Geometrical Drawing- A generalized approach by Arunvikram, Ch.Ratnam and P.Vasudevarao, IK International Pvt.Ltd., New Delhi.
2. A text book on Engineering Drawing by K.L .Narayana and P. Kanniah (Scitec publications (India) Pvt. Ltd.

**B.Tech. (Civil) First Semester
EURIE 111/211 WORKSHOP PRACTICE**

Category	Maximum marks			Periods				Credits
	Semester End Exam	Con. Eval	Total	Lectures	Tutorials	Practicals	Total	
BE	60	40	100	--	--	3	3	2

The main aim of Workshop Practice is to acquaint the student with the basic tools used in Workshop Practice and to develop skills in using these tools to perform simple tasks. The students should be able to work with these tools to prepare simple jobs in Wood Work **PRACTICE**, Sheet Metal Working, Forging and Fitting.

An illustrative list of tasks to be performed by the student is given below:

I. Wood Working - Familiarity with different types of woods used and tools used in wood Working technology.

Tasks to be performed:

- | | |
|----------------------------------|------------------------------------|
| 1) To make Half – Lap joint | 2) To make Mortise and Tenon joint |
| 3) To make Corner Dovetail joint | 4) To make Bridle joint. |

II. Sheet Metal Working – Familiarity with different types of tools used in sheet metal working, Developments of sheet metal jobs from GI sheets, knowledge of basic concepts of soldering.

Tasks to be performed:

- | | |
|---------------------------|----------------------------|
| 1) To make Square Tray | 2) To make Taper side Tray |
| 3) To make Conical Funnel | 4) To make Elbow Pipe. |

III. Forging – Familiarity with different types of tools used in forging technology.

Knowledge of different types of furnaces like coal fired, electrical furnaces etc...

Tasks to be performed:

- | | |
|----------------------------------------|----------------------------------------------------------------------|
| 1) To make round M.S rod to square rod | 2) To make L bend in given M.S. Rod. |
| 3) To make S bend in given M.S. Rod. | 4) To perform heat treatment tests like annealing, Normalizing etc.. |

IV. Fitting – Familiarity with different types of tools used in fitting technology.

Tasks to be performed:

- | | |
|-----------------------------|----------------------------------|
| 1) To make “V” – fitting | 2) To make Rectangular fitting |
| 3) To make Dovetail fitting | 4) To make Semi circular fitting |
| 5) To make Hexagon fitting | |

❖ **Student is required to work individually and complete at least three jobs in each technology.**

Dress Code:

- ❖ **For Boys** : Blue Colour Long Apron, Khaki Trousers, Half Sleeve Shirt (Tucked-in), Black Leather Shoes.
- ❖ **For Girls**: Blue Colour Long Apron, Salwar Suit, Black Shoes.

Reference Book:

1. Workshop Technology, Part 1, W.A.J. Chapman, Viva Low Priced Student Edition.
2. Elements of Workshop Technology, Volume 1, S.K.Hajra Choudhury, S.K.Bose.
3. A.K.Hajra Choudhury and Nirjhar Roy, Media Promoters and Publishers Pvt. Ltd.

B.Tech. (Civil) First Semester**EURPH 112/212:ENGINEERING PHYSICS LAB**

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P			Sem. End Exam	Con. Eval.
EURPH 212/112	BS	---	3	3	--	100	2

1. J – by Callender and Barne’s Method.
2. Thermal Conductivity of a Bad Conductor – Lee’s Method.
3. Magnetic Field Along the Axis of a Circular Coil Carrying Current – Stewart and Gee’s Galvanometer.
4. Hall Effect- Measurement of Hall Coefficient.
5. Carey Foster’s Bridge – Laws of Resistance and Specific Resistance.
6. Calibration of Low Range Voltmeter – Potentiometer Bridge Circuit.
7. Thickness of a Paper Strip- Wedge Method.
8. Newton’s Rings – Radius of Curvature of a Plano Convex Lens.
9. Diffraction Grating – Normal Incidence.
10. Determination of Refractive Indices (o and e) of a Bi-Refringent Material (Prism).
11. Cauchy’s Constants – Using a Spectrometer.
12. Dispersive Power of a Prism – Using a Spectrometer.
13. Determination of Rydberg Constant.
14. LASER – Diffraction.
15. Determination of Band Gap in a Semiconductor.
16. Optical Fibres – Numerical Aperture and Loss of Signal.
17. VI Characteristics of a pn-junction diode
18. Response of a series RLC Circuit

* * *

B.Tech. (Civil) First Semester
EURCS 113: PROGRAMMING WITH C Lab

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCS 113	BE	---	3	3	--	100	2

a) Write a C program to ask the user to enter one char (Upper-Case letter) check whether user entered a Upper-case letter or not(by using relational and logical operators) and then if user has entered a Upper-case letter convert into a Lower-case letter? (hint: Upper-case means capital letters, use ASCII information to check for Upper-case and convert)

b) Write a C program to ask the user to enter two integers and apply all arithmetic operations on those print the corresponding values?(hint : +,-,*,/,%)

c) Write a C program to Determine the ranges of char, short, int and long int variables both signed and unsigned

(i) By using sizeof operator (ii) By printing appropriate values from standard header (limits.h)

1. a) Write a Program to Find the Roots of a Quadratic Equation using if else and Switch statements.

b) Write a Program which Generates One Hundred Random Integers in the Range of 1 To 100, store them in an array and then prints the average. Write three versions of the program using Different Loop Constructs.

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

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

c) Write a C program to calculate the following

$$\text{Sum} = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$$

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

b) Write C programs that use both recursive and non-recursive functions

i) To find the factorial of a given integer.

ii) To find the GCD (greatest common divisor) of two given integers.

iii) To solve Towers of Hanoi problem.

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

b) Write a program to read set of elements in the array and sort them in ascending order.

c) Write a C program that uses functions to perform the following:

i) Addition of Two Matrices

ii) Multiplication of Two Matrices

iii) Transpose of a given Matrix

6. a) Write a C program that uses functions to perform the following operations:

i) To insert a sub-string in to given main string from a given position.

ii) To delete n Characters from a given position in a given string.

b) Write a C program to determine if the given string is a palindrome or not

c) Given an Array of Strings Write a Program to Sort the String in Dictionary Order.

7. Write a C program that uses functions to perform the following operations:

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

8. Write a C program that uses functions to perform the following operations:

a) Count number of characters, words in a file.

b) Write a C program to reverse the first n characters in a file.

(Note: The file name and n are specified on the command line.)

c) Write a C program which copies one file to another.

**B.Tech. (Civil) Second Semester
EUREG 201: ENGINEERING ENGLISH-II**

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EUREG 201	HS	4	---	3	60	40	3

Unit – I :Interpersonal Communication:

Introduction to Interpersonal Communication, Models of Interpersonal

Relationship Development, Team Work, Persuasion Techniques

Unit – II:Spoken Communication:

Importance of spoken communication, Basics of Spoken English

Situational Dialogues, Speech Making: Formal and Informal

Unit – III :Developing Vocabulary and Correcting Common Errors:

Homonyms, Homophones and Homographs, Synonyms and Antonyms

Oral and Written

Unit – IV: Information Transfer:

Using charts, Figures, Tables, Pictograms, Maps, Note Making

Note Taking

Unit – V: Reading for Enrichment

Sir Mokshagundam Visvesvaraya

Steve Jobs: The Early Years

Prescribed Book:

1. E. Suresh Kumar et al., **Communication for Professional Success**, Orient Blackswan, 2012.

Reference Books:

1. E. Suresh Kumar et al., **Communication Skills and Soft Skills**, Pearson, 2010.
2. Jayashree Mohanraj et al., **Speak Well**, Orient Black Swan, 2011.
3. **Oxford Advanced Learners' Dictionary**, 2010 Edition.

B.Tech. (Civil) Second Semester**EURMT202: HIGHER ENGINEERING MATHEMATICS – I**

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EURMT202	MT	3+1	---	3	60	40	3

Unit-I: Partial Differentiation-1

(10)

Introduction to Partial differentiation - Total derivative - Differentiation of implicit functions - Geometrical interpretation - Tangent plane and normal to a surface - Change of variables - Jacobians.

Unit-II: Partial differentiation-2

(08)

Taylor's theorem for functions of two variables. Total differential - Maxima and minima of functions of two variables - Lagrange's method of undetermined multipliers - Differentiation under the integral sign, Leibnitz's Rule.

Unit-III: Fourier Series

(12)

Euler's formulae - Conditions for a Fourier expansion - Functions having points of discontinuity - Change of interval - Odd and even functions - Expansions of odd or even periodic functions - Half range series and practical Harmonic Analysis.

Unit-IV: Partial differential equations

(12)

Formation of partial differential equations - Solutions of a partial differential equation - Equations solvable by direct integration - Linear equations of the first order - Non-linear equations of the first order - Homogeneous linear equations with constant coefficients - Rules for finding the complementary function - Rules for finding the particular integral.

Unit-V: Applications of Partial Differential Equations

(12)

Method of separation of variables – partial differential equations – wave equation – one dimensional heat flow – two-dimensional heat flow-solution of Laplace equation –Laplace equation in polar co-ordinates.

Text Books Prescribed :**Text Books Prescribed:**

1. *Higher Engineering Mathematics*, Dr.B.S Grewal. Khanna Publishers.
2. *Engineering Mathematics Vol.-I* Dr.T.K.V.Iyengar S.Chand.

References :

- Advanced Engineering Mathematics*, Erwin Kreyszig. Wiley Eastern Pvt. Ltd.
Textbook of Engineering Mathematics, N.P.Bali. Laxmi Publications (P) Ltd.
Higher Engineering Mathematics, Dr.M.K.Venkata Raman. National Pub. Co.

Note: The figures in parentheses indicate approximate number of expected hours of Instruction.

B.Tech. (Civil) Second Semester
EURMT203: HIGHER ENGINEERING MATHEMATICS – II

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EURMT203	MT	3+1	---	3	60	40	3

The objective of the course is to impart knowledge in Basic concepts of Mathematics relevant to Engineering applications.

Unit-I: Multiple Integrals-I (10)

Double integrals- Change of order of integration, Double integrals in Polar coordinates- Areas enclosed by plane curves,

Unit-II: Multiple Integrals-II (12)

Triple integrals - Volume of solids - Change of variables - Area of a curved surface. Beta and Gamma functions – Properties - Relation between beta and gamma functions – Dirichlet’s integrals of type I and type II.

Unit-III: Vector Differentiation (10)

Scalar and vector fields - Gradient, Divergence and Curl - Directional derivative – Identities - Irrotational and Solenoidal fields.

Unit-IV: Vector Integration (10)

Line, Surface and Volume integrals - Green’s theorem in the plane - Stoke’s and Gauss divergence theorems - Introduction of orthogonal curvilinear co-ordinates, Cylindrical co-ordinates and Spherical polar co-ordinates (self study)

Unit-V: Laplace transforms (12)

Transforms of elementary functions - Properties of Laplace transforms - Existence conditions - Inverse transforms - Transforms of derivatives and integrals - Multiplication by t^n - Division by t - Convolution theorem. Applications to ordinary differential equations and simultaneous linear equations with constant coefficients - Unit step function - Unit impulse function - Periodic functions.

Text Books Prescribed:

- | | | |
|-------------------------------------------|----------------------------------|--------------------|
| 1. <i>Higher Engineering Mathematics,</i> | Dr.B.S Grewal. | Khanna Publishers. |
| 2. <i>Engineering Mathematics Vol.-I</i> | <i>Dr.T.K.V.Iyengar S.Chand.</i> | |

References :

- | | | |
|---------------------------------------------|-----------------------|-----------------------------|
| <i>Advanced Engineering Mathematics,</i> | Erwin Kreyszig. | Wiley Eastern Pvt. Ltd. |
| <i>Textbook of Engineering Mathematics,</i> | N.P.Bali. | Laxmi Publications (P) Ltd. |
| <i>Higher Engineering Mathematics,</i> | Dr.M.K.Venkata Raman. | National Pub. Co. |

Note: The figures in parentheses indicate approximate number of expected hours of Instruction.

B.Tech. (Civil) Second Semester
EURPH 204:ENGINEERING PHYSICS – II

Code No.	Category	Scheme of instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURPH 204	BS	3+1	---	3	60	40	3

The aim of the course is to impart knowledge in basic concepts of physics relevant to engineering applications.

UNIT – I

(9 hours)

INTERFERENCE: Introduction - Interference in Thin Films - Wedge Shaped Film - Newton's Rings - Lloyd's Mirror - Michelson's Interferometer and Applications.

DIFFRACTION: Introduction - Differences between Fresnel and Fraunhofer Diffractions - Single Slit Diffraction (Qualitative and Quantitative Treatment) - Differences between Interference and Diffraction - Gratings and Spectra-Multiple Slits - Diffraction Grating - X-ray Diffraction - Bragg's Law.

UNIT – II

(9 hours)

POLARISATION: Introduction - Double Refraction - Negative Crystals and Positive Crystals - Nicol's Prism - Quarter Wave Plate and Half Wave Plate - Production and Detection of Circularly and Elliptically Polarised Lights.

LASERS: Introduction - Spontaneous and Stimulated Emissions - Population Inversion – Ruby Laser - He-Ne Laser - Semiconductor Laser – Applications.

UNIT – III

(10 hours)

MODERN PHYSICS (QUANTUM PHYSICS): Matter Waves - Heisenberg's Uncertainty Principle - Schrodinger's Time Independent Wave Equation - Physical Significance of Wave Function (ψ) - Application to a Particle in a one Dimensional Box (Infinite Potential Well) - Free Electron Theory of Metals - Band Theory of Solids (qualitative) -Distinction between Metals, Insulators and Semiconductors - Elementary Concepts of Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac Statistics (No Derivation).

UNIT – IV

(9 hours)

SEMICONDUCTORS: Introduction - Intrinsic and Extrinsic Semiconductors - Carrier Concentration in Intrinsic Semiconductors - Carrier Concentration in n-Type Semiconductors - Carrier Concentration in p-Type Semiconductors - Hall Effect and Applications -Variation of Carrier Concentration with Temperature - Conductivity of Extrinsic Semiconductor - PN Junction - Forward Bias - Reverse Bias -VI Characteristics of a PN Junction - Fundamentals of LED, LCD - Photovoltaic Cell (Solar Cell).

UNIT – V

(8 hours)

FIBRE OPTICS: Introduction - Optical Paths in Fibre - Optical Fibre and Total Internal Reflection - Acceptance Angle and Cone of a Fibre - Fibre Optics in Communications - Applications.

NANOSCIENCE: History – Definition - Size Dependent Properties (Qualitative): Mechanical and Electrical - Growth Techniques: Top Down (PVD, Ball Milling) - Bottom Up (Sol-Gel and Co-Precipitation) - Applications.

Prescribed Books :

Physics part I & II

Applied Physics

Reference Books:

Modern Physics

Solid State Physics

Materials Science

A Text Book of Engg. Physics

The Feynman Lectures on Physics

Resnick, Halliday, Krane. John Wiley & Sons.

P.K.Palani samy. Scitech Publications (India) Pvt Ltd., Chennai

Arthur Beiser.Tata Mc Graw-Hill.

S.O.Pillai. New Age International (P)Limited, New Delhi.

M. Arumugam. Anuradha Agencies, Kumbhakonam.

Kshirsagar & Avadhanulu. S.Chand and Co.

Addison-Wesley.

Note: The figures in parentheses indicate approximate number of expected hours of instruction.

B.Tech. (Civil) Second Semester
EURCH205:ENGINEERING CHEMISTRY-II

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam	Maximum Marks (100)		
		L/T	D/P	Duration in Hrs.	Sem. End Exam	Con. Eval.	
EURCH205	BS	3+1	---	3	60	40	3

UNIT-I. NON-CONVENTIONAL ENERGY SOURCES AND APPLICATIONS: (9 hours)

Chemical: Electrode Potential –Determination of Single Electrode Potential-Reference Electrodes – Hydrogen and Calomel Electrodes. Electrochemical Series and its Applications. Primary Cell–Dry or Leclanche Cell, Secondary Cell – Lead acid storage Cell – Ni – Cd, Li batteries , Fuel Cell–Hydrogen-Oxygen Fuel Cell. Methyl alcohol – Oxygen, Propane – Oxygen fuel cell.

Solar : Photoelectric cells –Applications of Solar Cells

UNIT-II. CORROSION ENGINEERING: (11 hours)

Definition of Corrosion, Theories of Corrosion –Dry Corrosion and Electro Chemical Corrosion Factors Affecting Corrosion- Nature of the Metal and Nature of the Environment. Prevention of Corrosion: Metallic Coatings –Galvanising and Tinning, Anodized Coatings, Cathodic Protection-Inhibitors, Organic Coatings-Paints –Characteristics, Constituents and their functions, Varnishes.

UNIT-III. FUEL TECHNOLOGY: CALORIFIC VALUE AND SOLID FUELS: (9 hours)

Classifications of Fuels – Characteristics of Fuels- Calorific Value - Units. Determination – Bomb Calorimetric Method- Dulong’s formula. Solid Fuels–Coal, Classification of Coal by Rank-Analysis of Coal –Proximate and Ultimate Analysis. Coke: Manufacture of Coke- Beehive oven and Otto Hoffmann’s by product Oven processes.

UNIT-IV. FUEL TECHNOLOGY : LIQUID FUELS: (8 hours)

Refining of Petroleum - Petroleum products used as Fuels - Gasoline - Knocking and Octane Number of Gasoline, Synthetic Petrol –Bergius and Fischer Tropsch methods. Diesel - Cetane Number, High speed and low speed Diesel oil.- Power Alcohol: Manufacture, Advantages and Disadvantages - LPG.

UNIT-V. LUBRICANTS : (8 hours)

Classification-Properties- Viscosity and Oiliness, Flash and Fire - Points, Cloud and Pour - Points. Aniline point, Saponification number – Carbon residue, Emulsification number volatilities, precipitation number, specific gravity, neutralization number. Principles and Mechanism of Lubrication - Fluid Film, Boundary and Extreme - Pressure Lubrications.

Text Books Prescribed :

<i>Engineering Chemistry,</i>	P.C. Jain and M. Jain.	Dhanapat Rai & Sons,	Delhi.
<i>Engineering Chemistry,</i>	B.K.Sharma.	Krishna Prakashan,	Meerut.
<i>A Textbook of Engineering Chemistry,</i>	Sashi Chawla.	Dhanapath Rai & Sons,	Delhi.

Reference Books :

<i>A Textbook of Engineering Chemistry,</i>	S.S.Dara.	S.Chand & Co. New Delhi.
<i>Material Science and Engineering,</i>	V.Raghavan.	Prentice-Hall India Ltd.

Note: The figures in parentheses indicate approximate number of hours of Instruction.

B.Tech. (Civil) Second Semester**EURCS 206: OBJECT ORIENTED PROGRAMMING WITH C++**

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCS206	BE	3	---	3	60	40	3

UNIT-I

Introduction to OOPS: Origins of C++, Object Oriented Programming, Headers & Name Spaces, Applications of OOP, Structure of C++ Program.

C++ Basics: Keywords, Constants, Data Types, Dynamic Initialization of Variables, Reference Variables, Operators in C++.

C++ Class Overview: Class Definition, Objects, Class Members, Access Control, Class Scope.

UNIT-II

Dynamic memory allocation and deallocation (new and delete), Parameter passing methods, static class members, Arrays of Objects, Objects as Function Arguments, Default Arguments, Const Arguments, Inline functions, Function Overloading, Friend Functions, this pointer, pointers to data members and member function.

UNIT-III

Constructors, Parameterized Constructors, Multiple Constructors in a Class, Constructors with Default Arguments, Dynamic initialization of Objects, Copy Constructors, Dynamic Constructors, Destructors.

Introduction to inheritance, Defining Derived Classes, Single Inheritance, Multiple Inheritance, Multi Level Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes, Constructors in Derived Classes.

UNIT-IV

Introduction to pointers, Pointers to Objects, Pointers to Derived Classes, compile time polymorphism, Run time polymorphism, Virtual Functions, Pure Virtual Functions, Virtual Destructors, Operator overloading, Rules for Operator overloading, overloading of binary and unary operators.

Files in C++: File I/O, Unformatted and Binary I/O, file handling library functions.

UNIT-V

Templates: Introduction, Class Templates, Class Templates with Multiple Parameters, Function Templates, Function Templates with Multiple Parameters, Member Function Templates.

Exception Handling: Basics of Exception Handling, Types of exceptions, Exception Handling Mechanism, Throwing and Catching Mechanism, Rethrowing an Exception, Specifying Exceptions.

Text Book:

1. **Object Oriented Programming in C++** by E. Balagurusamy., published by Tata McGraw-Hill.
2. **Computer Science : A Structured Approach Using C++** second [edition](#)
Behrouz A. Forouzan and Richard F. Gilberg

Reference Books:

1. **Mastering C++** by K.R. Venugopal., published by Tata McGraw- Hill.
2. **Object- Oriented Programming with ANSI and Turbo C++**, 1/e By [Ashok Kamthane](#)
3. **Problem Solving, Abstraction, and Design using C++ (6TH 11)**
Frank L. Friedman

B.Tech. (Civil) Second Semester
EURCS 213: OBJECTED ORIENTED PROGRAMMING LAB WITH C++

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCS 213	BE	---	3	3	--	100	2

- Write a CPP program that contains a function to exchange values of two arguments(swap) by using pointers and reference parameters.
- Write a CPP program to find the given string is palindrome or not. Declare private member function to find palindrome of the given string and access it using public member function.
- Write a CPP program to find transpose of 2D matrix and allocate memory dynamically to the matrix using dynamic memory allocation. Initialize and display contents of the matrix and deallocate memory.
- Write a CPP program to add two polynomials of any degree using object as function arguments. Hint: create two objects each represent one polynomial equation.
- Write a CPP program to add corresponding elements of two 2D matrices using friend function. Create two classes each capable of storing one 2D matrix. Declare the matrix under private access specifier and access them outside the class.
- Write a program to find total and average marks of each student in class. Create a student class with student number, name, 6 subject marks as its members and initializes the details. Use friend class that access the details of student and calculates total, average marks and prints the result.
- Write a program to add two matrices of same copy. Create two objects of the class and each of which refers one 2D matrix. Use constructor to allocate memory dynamically and use copy constructor to allocate memory when one array object is used to initialize another.
- Write a Program to Generate Fibonacci Series by using Constructor to Initialize the Data Members.
- Write a program for finding area of different geometric shapes (circle, Rectangle, cube). Use function overloading with type, order, sequence of arguments to find the area of shapes.
- Write a program which prompts the user to enter a string and returns the length of the longest sequence of identical consecutive characters within the string using pointers to data members and member function. For example, in the string "aaaAAAAjjB", the longest sequence of identical consecutive characters is "AAAAA".
- Write a program to calculate gross and net pay of employee from basic salary. Create employee class which consists of employee name, emp_id, basic salary as its data members. Use parameterized constructor in the derived class to initialize data members of the base class and calculate gross and net pay of the employee in the derived class.
- Write a program to calculate bonus of the employees. The class master derives the information from both admin and account classes which intern derives information from class person. Create base and all derived classes having same member functions called getdata, display data and bonus. Create a base class pointer that capable of accessing data of any class and calculates bonus of the specified employee. (Hint: Use virtual functions)
- Write a program to add two matrices of mxn size using binary operator overloading.
- Write a program to find transpose of a given matrix of mxn size using unary operator overloading.
- Write a program to concatenate one string to another using binary operator overloading.
- Write a program that uses functions to perform the following operations:
 - To copy contents of one file into another file.
 - To replace a word with other word in a given file?
 - To count the no of occurrences of a word in a given file
- Write a program to sort a given set of elements using function template.
- Write a program to search a key element in a given set of elements using class template.
- Write a program to find average marks of the subjects of a student. Throw multiple exceptions and define multiple catch statements to handle division by zero as well as array index out of bounds exceptions.
- Write a program to find factorial of a given number. Throw multiple exceptions and define multiple catch statements to handle negative number and out of memory exception. Negative number exception thrown if given number is negative value and out of memory exception is thrown if the given number is greater than 20.

B.Tech. (Civil) Second Semester
EURCH 214/114: ENGINEERING CHEMISTRY LAB

Code No.	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
		Hours per week		Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURCH 114/214	BS	---	3	3	--	100	2

The objective of the Laboratory Practicals is to make the student to acquire the basic Concepts on Engineering Chemistry.

1. Calibration of Volumetric Apparatus.
2. Determination of sodium carbonate in soda ash.
3. Estimation of Iron as Ferrous Iron in an Ore Sample.
4. Estimation of Calcium on Portland cement.
5. Estimation of volume strength of Hydrogen Peroxide.
6. a) Estimation of Active Chlorine Content in Bleaching Power.
b) Determination of Hardness of a Ground Water Sample.
7. Determination of Chromium (VI) in Potassium Dichromate
8. Determination of Copper in a Copper Ore.
9. a) Determination of Viscosity of a Liquid.
b) Determination of Surface Tension of a Liquid.
10. a) Determination of Mohr's Salt by potentiometric method.
b) Determination of Strength of an acid by pH metric method.

B.Tech. (Civil) Second Semester
EURME215/115: ENGINEERING GRAPHICS PRACTICE

	Category	Scheme of Instruction		Scheme of Examination			Credits to be awarded
				Sem. End Exam Duration in Hrs.	Maximum Marks (100)		
		L/T	D/P		Sem. End Exam	Con. Eval.	
EURME 215/115	BE	---	3	3	--	100	2

Introduction to AutoCAD: Beginning a new drawing, exploring and interacting with the drawing window, saving and opening a file, coordinate systems, draw commands, modify commands, dimensioning and object properties.

Sections of solids: Introduction, section planes, sections and true shape of a section. Sections and sectional views of solids- prism, pyramid, cylinder and cone.

Developments of surfaces: Introduction, Developments of lateral surfaces of right solids- cube, prisms, cylinders, pyramids and cones.

Intersection of Surfaces: Introduction, line of intersection, different methods, intersection of two prisms, intersection of two cylinders, intersection of cylinder and prism, intersection of cone and cylinder, intersection of cone and prism, intersection of cone and cone.

Isometric projections: Introduction, isometric axes, lines and planes. Isometric scale, isometric view and projections of solids in simple position- prism, pyramid, cylinder, cone and sphere.

Text books:

1. Engineering Drawing by N.D. Bhatt and V. M .Panchal, Charotar publishing house Pvt. Ltd, 49th edition, 2008.
2. Engineering Graphics with AutoCAD 2011 by James D. Bethune, Prentice Hall of India 2010, 1st edition.

References:

1. Geometrical Drawing- A generalized approach by Arunvikram, Ch.Ratnam and P.Vasudevarao, IK International Pvt.Ltd., New Delhi.
2. A text book on Engineering Drawing” by K.L .Narayana and P. Kanniah (Scitec publications (India) Pvt. Ltd)

B.TECH. (CE) III SEMESTER**EURCE 301: ENGINEERING MECHANICS – STATICS AND DYNAMICS**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 301	BE	4			4	60	40	100	4

UNIT-I

Equilibrium: Free body diagram – Equilibrium of rigid bodies acted on by concurrent and non-concurrent coplanar system of forces. Analysis of Truss – Method of joints, Method of sections

UNIT- II

Centroid and Centre of Gravity: Centre of gravity of parallel forces in a plane. Centroids and centre of gravity of composite areas and composite bodies.

UNIY-III

Moment of Inertia: Definition – Moments of inertia of areas by integrations. Radius of gyration – Parallel axis theorem– Perpendicular axis theorem - Moments of inertia of composite areas — Mass moment of inertia of simple bodies like disc, cylinder, rod, hoop, sphere.

UNIT-IV

Kinematics : Introduction – Recapitulation of basic terminology and concepts of Kinematics. Newton’s Laws of motion. Absolute Motion and Relative motion. Rectilinear motion of a particle. Curvilinear motion of a particle – Projectiles – simple problems.

UNIT-V

Kinetics : Introduction to Kinetics – Newton’s Laws of motion - Work , Energy - Potential energy and Kinetic energy – Law of Conservation of energy - D’ Alembert’s principle. Work-Energy Principle. Simple Applications of above principles to Rectilinear and Curvilinear motion of a rigid body.

REFERENCES BOOKS:

1. Timoshenko and D.H. Young, Engineering Mechanics, McGraw Hill, Fourth edition
2. Engineering Mechanics by Singer, Prentice Hall India.
3. J.L. Meriam John Wiley & Sons, Engineering Mechanics
4. F.B. Beer and E.R. Johnston, Jr., Vector, Mechanics for Engineers Statics and Dynamics, Tata McGraw Hill, Fourth edition, 2002
5. I.B. Prasad, Applied Mechanics, Khanna Publishers, Delhi, Tenth edition 1984
- 6 A.K.Tayal, Engineering Mechanics

B.TECH. (CE) III SEMESTER**EURCE 302: MECHANICS OF SOLIDS**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 302	BE	3	1	-	4	60	40	100	3

UNIT-I:**Stress**

Introduction; Method of sections; Definition of stress; Normal stresses in axially loaded bars; Stresses on inclined sections in axially loaded bars; Shear stresses ; Analysis for normal and shear stresses; allowable stress and factor of safety.

Strain

Introduction; Normal strain; Stress-strain relationships; Hooke's law; Poisson's ratio; Thermal strain and deformation; Deformation of axially loaded bars; statically indeterminate axially loaded bars; Stress-strain relationship for shear

Generalized Hooke's law and Pressure vessels

Generalized Hooke's law for isotropic materials; Relationship between Modulus of elasticity and Modulus of rigidity; Dilatation and Bulk modulus; Thin-walled pressure vessels – Cylindrical and spherical vessels

UNIT-II:**Internal forces in beams**

Introduction; Diagrammatic conventions for supports and loads; Calculation of beam reactions; Application of method of sections; Shear force in beams; Bending moment in beams; Shear force and bending moment diagrams for
 a) Cantilever
 b) Simply supported and c) Over hanging beams; Differential equations of equilibrium for a beam element

Normal stresses in beams

Introduction; Basic assumptions; the elastic flexure formula; application of flexure formula;

UNIT-III

Transformation of stress: The basic problem; Transformation of stresses in two dimensional problems; Principal stresses in Two-dimensional problems; Maximum shear stresses in two dimensional problems; Mohr's Circle of stress for Two-dimensional problems; Construction of Mohr's circles for stress Transformation;

UNIT-IV**Shear stresses in beams**

Introduction; Shear flow; The shear stress formula for beams; Shear stress in beam flanges; Shear centre

Torsion

Introduction; Application of the method of sections; Torsion of circular elastic bars – Basic assumptions, the torsion formula, Design of circular bars in torsion for strength, Angle of twist of circular bars

UNIT-V**Buckling of columns**

Introduction; Examples of instability; Criteria for stable equilibrium; Euler load for column with pinned ends; Euler loads for columns with different end restraints; Limitations of the Euler's formulae; Generalized Euler buckling load formulae; Eccentric loads and the secant formula

Text Book

1. Engineering mechanics of solids by E.P.Popov, Prentice Hall of India, 2005.
2. Strength of Materials by R.Subramanian, Oxford University Press.

Reference Books

1. Mechanics of Materials by James M. Gere & Stephen P. Timoshenko, CBS Publishers & Distributors, New Delhi
2. P.N. Singer and P.K. Jha, Elementary mechanics of solids, New Age International Pvt.Ltd
3. Ramamrutham, Strength of materials, Dhanpat Rai & Sons
4. Strength of materials by S. S. Bhavikatti, Vikas Publishing House Pvt. Ltd., 1998.

B.TECH. (CE) III SEMESTER**EURCE 303: BUILDING MATERIALS & BUILDING CONSTRUCTION**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 303	CE	3			3	60	40	100	3

PART – A – Building Materials**UNIT – I:****Building Stones:**

Stones Classification of rocks basing on geological, physical and chemical etc., characteristics and use of various stones available in India. Stone quarrying methods, precautions to be taken, various explosives to be used; Methods of dressing stones. Various tests on stones as per I.S code. Natural bed of stone. Artificial stones-Varieties.

UNIT – II:**Bricks, Glass and its products**

Bricks Qualities of brick earth, Classification of bricks. Manufacture of bricks, tests for good bricks as per I.S Code. Glass and its products. Raw materials for glass, manufacture of glass, properties and uses.

UNIT – III:**Wood**

Cross section details of a tree, Various methods of timber classification, Various types of defects in wood, Methods of seasoning, Properties of timber, Decay of timber, Plywood its types, manufacture of plywood, laminated wood, Batten board and particle board.

UNIT – IV: Paints

Constituents of a paint, uses, preparation on different surfaces, painting defects. Cements: Natural and artificial cements, types of artificial cements, uses, manufacture of OPC. Storing of cement.

PART-B: Building Construction**UNIT – V: Foundations**

Types of foundation, Brief description of shallow foundation, strip, isolated, combined footing, mat foundation. Stone and Brick masonry Types of stone and Brick masonry - Plastering – Pointing, Doors and Windows Types of doors and windows, Staircases, Different types of Stair Cases, Arrangement of Stairs.

References:

1. “Civil Engg. Materials”, by Technical Teachers’ Training Institute, Chandigarh, Tata McGraw Hill Publishing Company Ltd, New Delhi.
2. R.C. Smith, “Materials of Construction”, McGraw Hill Company, New York.
3. Surindra Singh, “Engineering Materials”, Konark Publishing Pvt. Ltd, New Delhi, 5th Edition
4. Rangwala, Building Materials, Charotar Publishing House, 7th edition, 1982.

B.TECH. (CE) III SEMESTER**EURCE 304: CONCRETE TECHNOLOGY**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 304	CE	3			3	60	40	100	3

UNIT-I:

Cement: Historical note, Chemical composition, Hydration of cement, Setting, Fineness of cement, Structure of hydrated cement, Different grades of cement, Tests on properties of cement.

UNIT-II:

Properties of aggregates: General classification of aggregates, Classification of natural aggregates, Sampling, Particle shape and texture, Bond of aggregate, Strength of aggregate, Other mechanical properties of aggregate, Specific gravity, Bulk density, Bulking of fine aggregate, Deleterious substances in aggregate, Soundness of aggregate, Alkali-silica reaction, Sieve analysis, Grading requirement, Practical grading.

UNIT-III:

Fresh concrete: Process of manufacture of concrete – Method of transportation, Placing and curing of concrete. Quality of mixing water. Properties of fresh concrete, Workability, Factors affecting workability, Measurement of workability. Definitions of segregation, bleeding and honey combing.

Admixtures: Benefits of admixtures, types of admixtures, accelerating admixtures, retarding admixtures, water-reducing admixtures, Superplasticizer, special admixtures.

UNIT-IV:

Strength of concrete: Water/cement ratio, effect of age on strength of concrete, relation between compressive and tensile strengths, bond between concrete and reinforcement. **Testing of hardened concrete:** Tests for compressive strength, effect of condition of specimen and capping, comparison of strengths of cubes and cylinders, tests for strength in tension, flexure test, split tension test, accelerated curing test. Definitions of Modulus of Elasticity, creep, shrinkage and Poisson's ratio. Introduction to durability of Concrete.

UNIT-V:

Special Concrete: concrete with different cementitious materials containing fly ash, GGBS, silica fume, High performance concrete, Self-compacting concrete, Light-weight concrete, Ready mix concrete, Fibre reinforced concrete and Polymer concrete. Selection of concrete mix proportions – IS method and ACI method.

Reference Books:

1. A M Neville, Properties of Concrete.
2. M S Shetty, Concrete Technology, S.Chand & Company Ltd., First Edition, Reprint, 2005.
3. P K Mehta, Microstructure of Concrete, Cement Ambuja, 1st edition, June 1997.

B.TECH. (CE) III SEMESTER**EURCE 305: SURVEYING**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 305	CE	3	1		4	60	40	100	4

UNIT-I:

Introduction: Introduction to plane surveying, principles of surveying, chain surveying, offsets, obstacles in chaining, **Compass Surveying** - whole circle bearing, reduced bearing, related problems, local attraction-related problems, errors in compass survey.

UNIT- II:

Plane Table Surveying - Merits and demerits, methods of plane table traversing, two point problem, three point problem, errors in plane tabling, **Levelling** – Definition of terms, Dumpy level, temporary adjustments, Height of Instrument method, Rise and Fall method -related problems, Reciprocal leveling, Longitudinal and Cross sectional leveling, errors in leveling.

UNIT- III:

Theodolite - Types of theodolites, temporary adjustments, measurement of horizontal and vertical angles, theodolite traversing - Open and closed traverse – Closing errors, Balancing the error – Bowditch method – Transit method, Omitted measurements – Gales traverse table.

UNIT- IV:

Tacheometry - Principle of tacheometry, stadia methods, tangential method, triangulation, classification, intervisibility of station, signals and towers, base line measurements, satellite station, Trigonometric leveling, elevation of top of the tower in same plane and different planes.

UNIT-V:

Contouring - Characteristics of contours, methods of contours, interpolation of contours, uses of contours. **Curves** - Simple curves, elements of simple curves, methods of setting simple curves, Rankines method, two theodolite method. Introduction to Auto-Levels, Total Station, GPS, Aerial Photography (Preliminary information and use).

Text Books:

1. "Surveying (Vol – 1, 2 & 3), by B.C.Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi
2. Duggal S K, "Surveying (Vol – 1 & 2), Tata Mc.Graw Hill Publishing Co. Ltd. New Delhi, 2004.
3. Arora K R "Surveying Vol 1, 2 & 3), Standard Book House, Delhi, 2004

Reference Books:

1. Surveying and levelling by R. Subramanian, Oxford university press, New Delhi
2. P. B. Shahani – Text of surveying Vol. I, Oxford and IBH Publishing Co – 1980
3. Chandra A M, "Plane Surveying", New age International Pvt. Ltd., New Delhi, 2002.
4. Chandra A M, "Higher Surveying", New age International Pvt. Ltd., New Delhi, 2002

B.TECH. (CE) III SEMESTER**EURCE 306: ENGINEERING GEOLOGY**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 306	BS	3			3	60	40	100	3

UNIT- I:

- 1.0 Geology – Branches of Geology
- 2.0 Rock weathering process
- 2.1 Soils – Soil Profile, Soil formation, Indian Soil Groups, Soil erosion and conservation.
- 3.0 Landforms – Produced by rivers.
- 4.0 Ground Water – Origin, distribution, aquifers, Porosity & Permeability and water bearing properties of rocks.

UNIT- II:

- 5.0 Minerals – Physical properties: Form, Colour, Streak, Lustre, Cleavage, Fracture, hardness and specific gravity.
- 5.1 Study of some important rock forming minerals – quartz, Feldspars, Pyroxenes, Amphiboles, Micas and Clays.
- 6.0 Rocks – Classification, Texture, Structure and Mineralogical composition of some typical Igneous, Sedimentary and metamorphic rocks. Granite, Syenite, Diorite, Gabbro, dolerite, Basalt, Breccia, conglomerate, sandstone, shale, limestone, Gneiss, khondalite, Schist, Slate, Marble, Quartzite, Charnockite.

UNIT- III:

- 7.0 Stratigraphic time scale – Major geological formations of India: Archeans, Cuddapahs, Vindhyan, Gandwanas and Deccan Trap Systems.
- 8.0 Elements of Structural Geology: Strike & Dip, Clinometer/Brunton Compass.
- 8.1 Description and Classification of Folds, Faults and Joints.

UNIT- IV:

- 9.0 Remote Sensing: Introduction, Electromagnetic Spectrum, Sensors & Platforms, IRS Satellites – applications to Civil Engineering.
- 10.0 Geophysical investigations of Civil Engineering importance: Introduction, Electrical Resistivity and Seismic refraction methods.
- 11.0 Natural Hazards: Origin, Classification and Mitigation of Earthquakes & Landslides.

UNIT- V:

- 12.1 Geological Investigations for Dams & Reservoirs.
- 12.2 Geological Investigations for Tunnels, Bridge sites & Highways.
- 12.3 Geological investigations for Coastal Structures.

Reference Books:

1. Parbin Singh, A Text Book of Engineering & General Geology, SK Kateria & Sons Publishers, Seventh editions, Reprint, 2004-2005.
2. N. Chennakesavalu, A Test Book of Engineering Geology, Macmillan Publishers, First Publishers, First Published 1993, Reprint 1997, 1999, 2003, 2004.
3. P. K. Guha, Remote sensing for the beginner, East West press

**B.TECH. (CE) III SEMESTER
EURCE 311: CONCRETE LABORATORY**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 311	CE			3	3	40	60	100	2

1. Determination of cube strength of Cement.
2. Determination of Setting time of Cement.
3. Determination of Fineness of Cement.
4. Determination of Specific Gravity of Cement.
5. Determination of Soundness of Cement.
6. Sieve Analysis of sand.
7. Determination of Specific Gravity of Sand.
8. Sieve Analysis of Coarse Aggregate.
9. Determination of Specific Gravity of Coarse Aggregate.
10. Determination of Workability of Concrete by Slump Cone test.
11. Determination of Workability of Concrete by Compaction factor apparatus.
12. Determination of Workability of Concrete by Vee Bee Consistometer.
13. Determination of Compressive Strength of designed mix Concrete by conducting cube compressive strength test.
14. Determination of Split Tensile Strength of Concrete.
15. Determination of Modulus of Rupture of Concrete Beam.

B.TECH. (CE) III SEMESTER**EURCE 312: SURVEYING FIELD WORK**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 312	CE			3	3	40	60	100	2

1. Distance between two inaccessible points using compass
2. Compass traversing-closing error.(Local Attraction)
3. Plane table traversing by radiation method
4. Distance between two inaccessible points using plane table
5. Determination of reduced levels – height of instrument method
6. Determination of reduced levels – Rise & Fall method
7. Measurement of horizontal angles by method of repetition.
8. Determination of height of an object when base is accessible
9. Determination of height of an object when base is not accessible
10. Determination tacheometric constants
11. Demonstration of Auto Level, GPS, Total Station

**B.TECH. (CE) III SEMESTER
EURCE 313: ENGINEERING GEOLOGY LABORATORY**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 313	BS			3	3	40	60	100	2

1. Study of physical properties of some important rock forming minerals. i) Silicate Minerals ii) Non-Silicate Minerals.
2. Study of megascopic properties of some typical rock types. i) Igneous rocks ii) Sedimentary rocks iii) Metamorphic rocks.
3. Description and engineering considerations of Structural Models – Folds, Faults & Joints.
4. Description and engineering considerations of tunnel models.
5. Analysis of Survey of India topo sheet.
6. Visual interpretation of remote sensing imageries.
7. Electrical resistivity survey & data interpretations.

**B.TECH. (CE) IV SEMESTER
EURCE 401: ENVIRONMENTAL STUDIES**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End	Continuous Evaluation	Total	
EURCE 401	HS	4			4	60	40	100	4

UNIT – I:

The Multidisciplinary nature of environmental studies – Definition, scope and importance, need for public awareness. **Natural Resources:** Renewable and non-renewable resources. Natural resources and associated problems – Forest Resources: Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over- utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food resources: world food problems, changes caused by agricultural and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. Energy resources: growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies. Land resources: Land as a resources, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable life styles.

UNIT-II:

Ecosystems: Concept of an ecosystem. Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystems: Forest ecosystems, Grassland ecosystems, desert ecosystems. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). **Biodiversity and its conservation:** Introduction: Definition: genetic, species of ecosystem diversity. Biogeographical classification of India. Value of Biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, national and local levels. India as a mega-diversity nation. Hotspots of biodiversity, Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In- situ and Ex-situ conservation of biodiversity.

UNIT-III:

Environmental Pollution: Definition, Causes, effects and control measures of Air Pollution, Water Pollution, Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Nuclear hazards. Solid waste management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies, Disaster Management: floods, earthquakes, cyclones and landslides.

UNIT-IV:

Social Issues and the environment: From unsustainable to sustainable development. Urban problems related to energy, Water conservation, rain water harvesting and watershed management. Resettlement and rehabilitation of people, its problems and concerns. Case studies. Environmental ethics: Issues and possible solutions. Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act .Water (Prevention and Control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Issues involved in enforcement of environmental legislation. Public awareness.

UNIT-V:

Human Population and the Environment: Population growth, variation among nations, Population explosion– Family welfare programme. Environment and human health. Human rights, Value education, HIV/AIDS, Women and Child welfare, Role of information technology in environment and human health. Case Studies.

Field Work: Visit to local area to document environmental assets-river/forest/grassland/hill/ mountain. Visit to a local polluted site-Urban/Rural/Industrial/Agricultural. Study of common plants, Insects, birds. Study of simple ecosystems – pond, river, hill slopes, etc.

References: Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha. Published by – University Grants Commission, Universities Press, India.

B.TECH. (CE) IV SEMESTER**EURCE 402: STRUCTURAL ANALYSIS – I**

Course Code	Category	Hours of Instruction per week			Total Hours	Mark			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 402	CE	3	1		4	60	40	100	3

UNIT-I:

Deflection of statically determinate structures (a) Beams using Macaulay's method, moment - area method, unit load method (b) Trusses (having 9 members or less) using unit load method.

UNIT-II:

Shear force and bending moment diagrams for (a) fixed beams (b) three span continuous beams using (i) Theorem of three moments (ii) Slope - deflection method.

UNIT-III:

Shear force and bending moment diagrams for (a) fixed beams (b) three span continuous beams using Moment distribution method.

UNIT-IV:

(a) Open coiled helical springs subjected to axial load (b) thick cylinders.

UNIT-V:

Moving loads: Maximum Bending moment at a section, under a wheel load and absolute maximum Bending moment in the case of several wheel loads. Influence lines for Beams (statically determinate and indeterminate beams)

References :

1. Pundit & Gupta, Structural Analysis, Tata McGraw Hill Publishing Company Ltd, New Delhi
2. Ramamrutham, Strength of Materials, Dhamapat Rai & Sons, Eleventh edition, 1994
3. Junarkar, Mechanics of structures, Charotar Book Stall, 2nd edition, 1957.
4. Timoshenko and Young, Elementary Strength of Materials, Affiated East West Press Pvt. Ltd, 5th edition, 1968.
5. Singer. F.L, Strength of materials, Harpe Collins Publishers India Ltd., Delhi.
6. Jain and Arya, Strength of Materials, Khanna Publishers, New Delhi.
7. Vazirani.V.N and Ratwani.M.M, Analysis and Design of Structures, Khanna Publishers, New Delhi.

B.TECH. (CE) IV SEMESTER
EURCE 403: BUILDING PLANNING AND DRAWING

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 403	CE	2		3	5	60	40	100	4

UNIT – I :

Residential Buildings : Different types of Residential Buildings, Selection of site for residential buildings. Guidelines for planning and drawing of residential building.

UNIT – II:

Orientation of Buildings, Principles of Planning, Design of Individual rooms with particular attention to functional and furniture requirements.

UNIT– III:

General Building regulations and Bye laws for Residential Buildings.

UNIT– IV: Climatology: Elements of climate: Sun, Wind, Relative Humidity, Temperature. Mahoney Tables, Comfort conditions for house. Various types of Macroclimatic zones, Design of Houses and layouts with reference to climatic zones. Solar charts. Wind Roses, Ventilation

UNIT– V:

Anthropometric Data. Housing colonies for different income groups in India – sizes of Plots – Public spaces. Evolutionary housing concept.

Drawing: At least Ten sheets shall be drawn during the semester manually using mini- drafter or set squares.

- (1) Conventional signs of materials.
- (2) A Small House (One Room and Verandah) (Copying exercise).
- (3) Two bed room house (Copying exercise).
- (4) Three bed roomed House in HOT and ARID zone, Hot and humid zone & Cold zone (copying exercise).
- (4) Duplex Type House.
- (5) Houses with given Functional requirements and climatic data. Emphasis may be given to Hot and HUMID.

Note: Drawings Exercises for practice: Brick Masonry, Staircases, Flats/Apartments (copying exercise)
 - Not to be included in examination.

References:

1. O.H. Koinesberger, Manual of tropical housing and building climatic design part-1
2. Deshpande, Modern ideal home for India, Deshpande Publications, 10th edition, December 1982.
3. Y.N.Sane, Planning and designing, Allies Book Stall, Pune
4. Gurucharn Singh, Planning Designing & Sheduling, Standard Publishers Distributors, 5th edition, Reprint 2004.
5. Dr.B.P.Verma, Civil Engineering Drawing & Housing, Khanna Publishers, Delhi6. Civil Engg. Drawing-‘B’ Series by Trimurthy, Premier Publishing House, Hyderabad.

B.TECH. (CE) IV SEMESTER
EURCE 404: FLUID MECHANICS – I

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 404	BE	3	1		4	60	40	100	3

UNIT-I:

Introduction and Fluid Properties: Definition of Fluid, Fluid as continuum, Mass density, specific weight, specific volume, relative density, viscosity – Newton’s Law of viscosity, Newtonian and Non-Newtonian fluids, Kinematic viscosity, surface tension and capillarity, Bulk Modulus, compressibility, vapour pressure.

Fluid Statics: Variation of pressure in static fluid, Absolute and gauge pressure – pressure measurement. Manometers and pressure gauges. Forces on plane and curved bodies immersed in static Fluids – Centre of pressure – pressure diagram – Lock gates

UNIT-II:

Buoyancy: Archimedes’ Principle – Buoyancy – Centre of Buoyancy – Metacentric Height.

Kinematics of Fluid Motion: Methods of Describing Fluid Motion – Types of Flow – Steady and un-steady flows, uniform and non-uniform flows-Three, Two and one dimensional flows, Laminar and Turbulent motion – Streamlines, Path lines, Streaklines, Continuity equation, acceleration, rotation, stream function, velocity potential, relation between them, Laplace equation, Flow net and its applications.

UNIT-III:

Fluid dynamics: Equation of motion for ideal fluids – Euler’s equations – deduction of Energy equation from Euler’s equation for irrotational flow – Bernoulli’s Equation, Energy correction factor. Practical applications of energy principle.

Laminar flow: Laminar Flow through pipes – Hagen – Poiseuille equation for viscous flow – Laminar Flow through porous media, Stokes’ law.

UNIT-IV:

Impact of Jets: Linear Momentum Equation, Impulse - Momentum equations, Momentum correction factor, practical applications of momentum principle – pipe bend - Impact of fluid jets on flat plate and curved vane (both stationary and moving).

UNIT-V:

Analysis of Pipe Flow: Steady flow through pipes – Energy loss – Major & Minor losses Head Loss due to friction, Darcy – Weisbach equation for pipe flow, Hydraulic gradient line, Total energy line - Pipes in series and parallel – Concept of equivalent pipe length – Pipe network analysis – problems in pipe flow – Syphon – transmission of power through pipes – Water Hammer.

Text Books:

1. A.K. Jain, Fluid Mechanics, Khanna Publishers, Delhi
2. P.N. Modi & S.M Seth, Hydraulics and Fluid Mechanics, Standard Book House, Delhi

Reference Books:

1. K.R. Arora, Fluid Mechanics, Hydraulics and Hydraulic Machines, Standard Publishers, Delhi
2. K. Subramanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill Publishing Company Limited, New Delhi
3. Victor L. Streeter & E. Benjamin Wylie, Fluid Mechanics, Tata McGraw Hill Publishing Company Limited, New Delhi

B.TECH. (CE) IV SEMESTER**EURCE 405: ENVIRONMENTAL ENGINEERING - I**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 405	BE	3	1		4	60	40	100	3

UNIT-I:

Introduction – Need for protected water supplies-objectives of water supply systems - Role of Engineers in public health.

Quantity of water: Water demand-Estimating requirements – Design period- per capita consumption, factors effecting –fire demand- fluctuations in demand – Population forecasting.

UNIT-II:

Sources of water – Classification – Choice of source with regard to its suitability- quantitatively and qualitatively – Surface and Sub-surface sources, wells – classification, specific yield, sanitary well.

UNIT-III:

Intakes for collection of surface water: Types of Intakes : Lakes, river and canal intakes. Transportation of Water- types of conduits – capacity and design – materials for pipes – pipe joints – laying and testing of pipes – corrosion of pipes and control – leakages -detection and prevention. Quality of Water : Objectives, Palatability, Quality control of water supply-Impurities in water, Characteristics, Examination of water, water sampling and analysis, water borne diseases, Standards of drinking water for different usages.

UNIT-IV:

Purification of Water - Introduction, methods of Treatment: Objectives of water treatment – Basic considerations of treatment – Pretreatment – Plain sedimentation – Coagulation – Flocculation and sedimentation with coagulation-Filtration – Classification – Working principles – Construction and operation – problems in filtration.Treatment of water: Disinfection of water-different methods-chlorination practices-chlorine demand – taste and odour control – Removal of hardness- Iron and manganese- Fluorides.

UNIT-V:

Distribution Systems: Requirements, classification- Layouts and systems of layouts – analysis of pipe network – different methods — Fixing the capacities of Service Reservoirs.

Water supply Installations in buildings- plumbing systems, appurtenances in distribution system, pipe fittings, storage of water, Design considerations. Maintenance of water supply Installations.

Text Books :

1. Dr. P.N. Modi, Water Supply Engineering, Standard Book House.
2. G.S. Birde & J.S.Birde, Water supply and Sanitary Engineering, Dhanpat Rai & Sons.
3. Duggal, Water supply and Sanitary Engineering, S.Chand & Company (Pvt) Ltd.
4. S.K.Garg, Water & Waste water Engineering, Vol. I, Khanna Publishers, fifth edition, Jan. 1987.
5. Dr.B.S.N. Raju, Water supply and Waste Water Engineering, TaTa Mc.Graw Hill.
6. Metcalf & Eddy, Waste Water Treatment, Disposal and Reuse, McGraw Hill, 2nd edition 1979.
7. Dr. P.N. Modi., Sewage treatment and disposal, Standard Book House.
8. Fair /Geyre/okun, Water & Waste water Engineering - Voulme-1, Wiley Toppan.

B.TECH. (CE) IV SEMESTER**EURCE 406: HIGHER ENGINEERING MATHEMATICS – III**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 406	MT	3	1		4	60	40	100	3

UNIT-I: Differentiation of Complex Functions:

Functions of a complex variable – analytical functions – Cauchy-Riemann equations – elementary functions of z – conformal mappings – bilinear transformation. Special conformal transformation ($w = z^2$, $w = z + 1/z$, $w = \cosh z$).

UNIT- II: Integration of Complex Functions:

Integration in the complex plane, Cauchy's theorem, Cauchy's integral formula – series of complex (Functions) – Taylor's series – Laurent's series – residue theorem – evaluation of real definite integrals (unit circle, semi circle)

UNIT - III: Difference equations: Introduction – definition – order and solution of difference equations – linear difference equations – rules for finding complementary function- rules for finding Particular Integral – Difference equations reducible to linear form – simultaneous difference equations with constant coefficient.

UNIT- IV: Numerical Methods

Solution of non-linear algebraic equations: Bisection method, Method of false position, iteration method, Newton-Raphson method.

Numerical solutions of ODE. Single step methods: solution by Taylor's method, Picard's method, Euler's method, Modified Euler's method, Runge Kutta Method (2nd order and 4th order) Multistep methods: Milne's method, Adams-Bashforth method.

UNIT -V: Probability Distribution:

Introduction to probability – Baye's theorem – Random variables – Discrete Probability distribution – continuous probability distribution – expectations – moment generating function – Binomial distribution – Poisson distribution – Normal distribution – Uniform distribution.

Text Books:

- Higher Engineering Mathematics by Dr.B.S.Grawel, Khanna publishers, Introductory methods for Numerical analysis, 4th edition, S. S. Sastry, PHI Publications.

Reference books:

- Kreyszig E., Advanced Engineering Mathematics, Wiley Eastern.
- Probability and Statistics, 2/e, Spiegel, TMH.
- Text Book of Engineering Mathematics by N.P. Bali et. al, Laxmi Publications (P) Ltd., New Delhi- 110 002.
- Higher Engineering Mathematics by Dr.M.K.Venkata Raman, National Pub.Co., Madras-1.
- Elementary numerical analysis, Samel D. Carte/carl D. Boor. 3rd edition, Mc. Grahill, int-edition.

B.TECH. (CE) IV SEMESTER
EURCE 411: FLUID MECHANICS LABORATORY – I

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 411	BE			3	3	40	60	100	2

1. Calibration of (a) small orifice, (b) mouthpiece by constant head method and falling head method.
2. Calibration of (a) orifice meter, (b) nozzle meter, and (c) venturi meter.
3. Calibration of sharp-crested and broad-crested weirs, v-notch.
4. Characteristics of flow over a sharp crested full width weir.
5. Verification of Bernoulli's equation
6. Pipe Friction
7. Pitot tube

Case Study:

8. Case Studies related to practical applications of Fluid Mechanics Concepts.

B.TECH. (CE) VI SEMESTER**EURCE 412: ENVIRONMENTAL ENGINEERING LABORATORY – I**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Sem End Exams	Continuous Evaluation	Total	
EURCE 412	CE			3	3	40	60	100	2

Experiments on :

Physical Analysis (1) Turbidity (2) conductivity.

Chemical Analysis: (1) pH (2) Determination of Hardness (Total) (3) Determination of Iron (Total Iron) (4) Determination of Fluorides (5) Determination of Residual Chlorine (6) Acidity (7) Alkalinity (8) Available Chlorine (9) Determination of Calcium Hardness (10) Determination of Optimum dosage of Coagulant (Jar Test)

Bacteriological Examination of Water* :(1) Determination of MPN and plate count tests

* Optional

B.TECH. (CE) VI SEMESTER**EURCE 413: STRENGTH OF MATERIALS LABORATORY**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 413	CE			3	3	40	60	100	2

1. Tension test on mild/HYSD bars.
2. Compression test on wood (parallel and perpendicular to grains).
3. Tests on springs for the determination of rigidity modulus and spring constant.
4. Brinell's and Rockwell hardness tests.
5. Charpy and Izod impact tests.
6. Double shear test on mild steel specimen.
7. Bending test.: Load deflection test for the determination of Young's modulus on simply supported and cantilever beams (wood and steel).
8. Study of forces in coplanar force system.

EURCE 414: INDUSTRIAL TOUR

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Evaluation	Total	
EURCE 414	IT								0

Local tours to Project sites in and around Visakhapatnam

B.TECH. (CE)V SEMESTER**EURCE 501: STRUCTURAL ANALYSIS – II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 501	CE	3	1		4	60	40	100	3

UNIT-I:

Analysis of statically indeterminate trusses (having not more than 7 members and 3 supports) containing (a) external redundant supports (b) internal redundant members, using Castigliano's theorem – II.

UNIT-II:

Analysis of statically indeterminate frames (Single storey single bay portal frames only) using moment distribution method and kani's method.

UNIT-III:

Arches: Introduction to Arches. Analysis of three hinged and two hinged arches subjected to concentrated loads and uniformly distributed loads (Rolling loads and influence lines not included).

UNIT- IV:

Introduction to Matrix Methods: Analysis of two and three span continuous Beams only by Flexibility and Stiffness Matrix methods.

UNIT-V:

Finite element method: Introduction to finite element method, concept of an element (beam element, truss element), formulation of element stiffness matrix (for beam element and truss element), assemble of global stiffness matrix (for beam element and truss element). Two dimensional constant strain triangle. Modeling, boundary conditions, Solution of banded matrix.

Reference Books:

1. C.K. Wang, Statically indeterminate Structures
2. Weaver & Gere, Matrix Methods of Structural Analysis
3. J.S. Kinney, Indeterminate Structural Analysis, Naraja Publishing house, 1st Printing, 1987
4. GS Pandit, SP Gupta, R. Gupta, Theory of Structures-Vol. I and II, Tata McGraw-Hill, 2nd Reprint, 2003
5. Vazirani and Ratwani, Analysis of Structures Vol. II.
6. Zienkiewicz.P, P., The Finite Element Method in Engineering and Science" McGraw Hill, 1971.
7. Tirupathi.R.Chandrupatla, Finite Elements Analysis, Universities Press.

B.TECH. (CE) V SEMESTER

EURCE 502: REINFORCED CONCRETE STRUCTURES –I

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuou s Evaluatio	Total	
EURCE 502	CE	3	1		4	60	40	100	3

UNIT-I:

Loading standards as per IS 875, grades of steel and concrete. Introduction to working stress, ultimate load and limit state methods. Working stress method: Assumptions. Flexure of RCC beams of rectangular section. Under reinforced, balanced and over-reinforced sections. Analysis and design of singly reinforced beams of rectangular sections.

UNIT-II:

Limit state method: Flexure of RCC beams of rectangular section. Under reinforced, balanced and over-reinforced sections. Analysis and design of singly and doubly reinforced beams of rectangular sections. Design of T-beams: Effective flange width. Analysis and Design of T-Beams.

UNIT-III:

Shear, Torsion and Bond: Limit state of collapse in shear, types of shear failures, Truss analogy, shear, span/depth ratio, Calculation of shear stress, types of shear reinforcement, Design for shear in beams. Analysis for torsional moment in a member. Torsional shear stress in rectangular sections. Reinforcement for torsion in RC beams. Concept of bond, development length, anchorage.

UNIT-IV:

Design of one-way and two-way slabs (using IS 456): Design of simply supported slabs on four sides with and without torsional reinforcement at corners. Design of two-way slabs with different edge conditions (with torsion at corners). IS code provisions. Introduction to Flat Slabs

UNIT-V:

Columns: Short columns, minimum eccentricity, column under axial compression. Analysis and design of short columns subjected to uniaxial moment. Analysis and design of short columns subjected to bi-axial moments.

Reference:

1. Pillai & Menon, Reinforced Concrete Design, Tata Mc.Graw Hill, Second edition, 6th Reprint 2005.
2. A.K.Jain, Reinforced Concrete Design (Limit state design)– Nem Chand & Bros, Roorkee, 6th edition 2002.
3. P.C.Verghese, Limit State Design of Reinforced Concrete, Prentice hall India, 2nd edition, 2003.
4. S.N.Sinha, Reinforced Concrete Design, Tata Mc.Graw Hill, 2nd edition, 2nd reprint 2000.

**B.TECH. (CE) V SEMESTER
EURCE 503: STEEL STRUCTURES – I**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End	Continuous Evaluation	Total	
EURCE 503	CE	3	1		4	60	40	100	3

UNIT-I:

General: Fundamental Concepts of design of structures, Different types of rolled steel sections available to be used in steel structures. Stress Strain relationship for steel.

Bolted connections: Failure of a joint, Strength and efficiency of a joint, Lap Joint, Butt joint and Eccentric connections

UNIT-II:

Welded Connections: Types of welds, stresses in welds, Design of welded joints subjected to axial load, Eccentric welded connections.

UNIT-III:

Tension members: Allowable stress in axial tension, Net effective sectional area for angle and Tee sections, Design of tension members, Lug angles.

UNIT-IV:

Compression members: Effective length, radius of gyration and slenderness of compression members, Allowable stresses in compression, Design of axially loaded compression members, Built up compression members (I Section & two channels) Laced and Battened columns, eccentrically loaded columns, Column splices.

UNIT-V:

Beams: Allowable stresses in bending, shear and bearing, Effective length of compression flange, laterally supported and unsupported beams, Design of plated beams, Design of rivets connecting cover plates with the flanges of beams.

* All the designs conforming to latest revised code of IS-800

Text Books:

- 1) S. K. Duggal, Design of Steel Structures –Tata McGraw Hill
- 2) S.S.Bhavikatti, Design of Steel Structures – I.K.International Publishing House Pvt. Ltd

References:

- 1) N.Subramanian, Design of Steel Structures, Oxford University Press
- 2) K.S.Sai Ram, Design of Steel Structures, Pearson Education
- 3) Limit State Design of steel structures IS:800-2007-V.L.Shah and Veena Gore, Structures Publications, Jai – Tarang, 30 Parvati, Pune
- 4) Ramachandra, Design of Steel Structures, Standard Book

B.TECH. (CE) V SEMESTER**EURCE-504: GEOTECHNICAL ENGINEERING – I**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 504	CE	3	1		4	60	40	100	3

UNI-I

Soil properties- Origin and formation of soils; Three Phase Representation of Soil Mass, Physical properties of Soil – Void ratio, Porosity, Degree of Saturation, Water content, Unit Weights, Specific Gravity – their functional relationships, Relative density .

Consistency limits – Determination and various indices – Plasticity index, Consistency Index, Liquidity Index Toughness Index– Significance and Importance, Activity Ratio

Classification : Mechanical analysis – Sieve analysis, Stoke’s law, hydrometer Analysis, I.S and MIT Grain Size Classification, Indian Standard Classification for fine grained and coarse grained soils for general engineering purposes.

UNIT-II :

Soil Hydraulics – Types of soil water, Darcy’s law and its limitations, Determination of Coefficient of permeability, Laboratory methods-constant head and variable head permeameter tests, Factors influencing coefficient of permeability, permeability of stratified soils. Stress Principle for Saturated Soils-Total, neutral and effective stresses, No flow, downward flow and upward flow conditions, quick sand conditions, critical hydraulic gradient.

UNIT-III :

Stress distribution : Boussinesq’s theory for the determination of vertical stresses due to point loads, assumptions and validity, extension to rectangular and circular loaded areas,

2 : 1 approximate method, Westergaard’s theory, Newmark’s influence chart - Construction and use, Contact pressure distribution beneath rigid footings, founded on cohesive & cohesion less soils.

UNIT-IV :

Consolidation: Oedometer Tests, e-p and e Vslog p curves – compression index, coefficient of compressibility and coefficient of volume change. Terzaghi’s assumptions for one dimensional consolidation, equation and application, coefficient of consolidation, degree of consolidation Vs time, curve fitting methods, initial compression, primary compression and secondary compression, determination of pre-consolidation pressure by casagrande’s method. Normally consolidated, over consolidated and under consolidated clayey deposits.

Compaction: Mechanism of compaction, Factors affecting compaction, British Standard, Modified AASHO and IS Light/Heavycompaction tests. Effect of compaction on physical and engineering properties of soils, Field compaction Equipment and Quality Control, Proctor’s Penetrometer.

UNIT-V :

Subsoil Exploration: Methods of subsoil exploration Direct, methods, Soundings by Standard, Dynamic cone and static cone penetration tests, Types of Boring, Types of samples, Criteria for undisturbed samples, Transport and preservation of samples, Bore-logs, planning of exploration programs, Report writing.

Reference books:

1. Gopala Ranjan and A.S.R. Rao., Basic and Applied Soil Mechanics, New age international Publishers.
2. V.N.S. Murthy, Soil Mechanics, Foundation Engineering, UBS Publishers, distribution Ltd.
3. K.R. Arora, Soil Mechanics and Foundation Engineering, Standard Publishers, New Delhi.
4. Swami Saran, Analysis and Design of Substructures (limit state), Oxford & IBH Publications Pvt Ltd, New Delhi (New edition-Taylor & Francis Ltd Publishers).
5. Donald P. Coduto, Geotechnical Engineering, Prentice-Hall India Publications.
6. B.C.Punmia, Soil Mechanics and Foundations, (SI Units) Laxmi Publications, New Delhi.

B.TECH. (CE) V SEMESTER
EURCE 505: FLUID MECHANICS – II

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 505	CE	3	1		4	60	40	100	3

UNIT-I:

Dimensional Analysis, Similitude and Modelling: Dimensional Analysis – Buckingham π Theorem – Rayleigh method – Similarity Laws – Reynolds, Froude, Weber, Mach and Euler Numbers, Principles of Modelling – Scale Models in Hydraulic Engineering – Application to Practical problems.

UNIT-II:

Boundary Layer Theory: Definition, Displacement, Momentum and Energy thicknesses – boundary layer growth along a flat plate– Laminar & Turbulent Boundary Layers – Laminar sub-layer.

Drag and Lift: Definitions, friction drag and form drag; Drag over flat plate, Drag characteristics of cylinder (two dimensional body) and three dimensional bodies (sphere, circular disc): Flow past air foil; separation and wake effects; Von Karman Vortex Street. Circulation and lift, Magnus effect; lift characteristics of cylinder, and air foil

UNIT-III:

Flow through open channels: Flow over Notches and Weirs: Triangular Notch and Rectangular Notch – Sharp Crested Weir and Broad Crested Weir – Comparison between closed conduit and free surface flow - classification of free surface flows – pressure distribution in open channels - Uniform flow, normal depth, Chezy's and Manning's equations, prismatic and non-prismatic channels; Most efficient channel sections for rectangular, trapezoidal cross sections; Specific energy in open channels – Critical flow, critical depth – Flow in channel transitions – Flow through channels with varying bed width and depths.

UNIT –IV:

Non-Uniform Flow in Open Channels: Specific Force - Hydraulic jump in channels - loss of energy in jump for rectangular channels – Gradually varied flow in rectangular channels; Equation of GVF; Water surface slopes w.r.t. channel bed; Classification of slopes; GVF profiles-M1, M2 , M3,S1,S2,S3, C1, C3, H2, H3, A2 and A3 Curves.

UNIT –V:

Pumps: (Theory only) Centrifugal Pumps – Single and Multistage Pumps – Working Principles – Priming – Head, Power and Efficiency – Cavitation in Pumps – Minimum starting speed of Centrifugal Pumps – Characteristic Curves and Specific Speed. Other types of pumps – Jet Pumps – Vertical Turbine Pumps – Submersible Pumps.

Turbines: (Theory only) Classification of Turbines – Impulse Turbines - Reaction Turbines – Various components and their functions – Draft Tubes – Radial, axial and mixed flow turbines – Impulse Turbines – Unit quantities, Specific Speed and Performance characteristics of Turbines.

Text Books:

1. A.K. Jain, Fluid Mechanics, Khanna Publishers, Delhi
2. P.N. Modi & S.M. Seth, Hydraulics and Fluid Mechanics & Hydraulic Machines, Standard Book House, Delhi
3. K. Subramanya, Flow in Open Channels, Tata McGraw Hill Publishing Company Limited, New Delhi

Reference Books:

1. K.R. Arora, Fluid Mechanics, Hydraulics and Hydraulic Machines, Standard Publishers, Delhi
2. K. Subramanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill Publishing Company Limited, New Delhi
3. Victor L. Streeter & E. Benjamin Wylie, Fluid Mechanics, Tata McGraw Hill Publishing Company Limited, New Delhi
Ven Te Chow, Open-channel hydraulics, McGraw-Hill Company, International student edition

B.TECH. (CE) V SEMESTER**EURCE 506: ENVIRONMENTAL ENGINEERING – II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 506	CE	3	1		4	60	40	100	3

UNIT-I:

Introduction – Sanitation – Systems of sanitation – relative merits & demerits – collection and conveyance of waste water.

UNIT-II:

Sewerage –classification of sewerage systems – sewers – types of sewers – Quantity of sewage – fluctuations – Hydraulics of sewers – design of sewers – materials for sewers – appurtenances in sewerage systems – safety of sewer workers. Design: Pumping of waste water – Pumping stations – location – component parts.

UNIT-III:

Bacteriology of sewage: Characteristics of sewage – decomposition – cycles of decomposition – sampling and analysis of waste water – BOD – COD.

UNIT-IV:

Waste water treatment : Primary treatment- Screens-grit chambers – grease traps – floatation – sedimentation – design of primary and pretreatment units -Design of Septic Tank, Imhoff tank -Sludge digestion and disposal, Secondary treatment : Sewage filters – Classification – trickling filters – mechanism of impurities removal – filter problems – design operation – recirculation-Activated sludge process – principles and designs – modifications of activated sludge process . Design Sludge treatment and disposal : Characteristics of sludge thickening – digestion – drying – sludge Miscellaneous methods – Oxidation ponds, oxidation ditches – aerated lagoons,- Stabilization ponds ,disposal.-Sewer Less sanitation practices, Different kinds of privies.

UNIT-V:

Sanitary Installations : Sanitary fittings, plumbing systems of drainage – single stack system – one pipe and two pipe systems – Design of building drainage, Maintenance of Sanitary Installations Sewage disposal: meaning, objectives and methods –disposal by dilution-self purification of running streams-zones of pollution-disposal by irrigation-reuse of treated sewage-ground water recharge.

Books:

1. G.S.Birde & J.S.Birde, Water supply and Sanitary Engineering, Dhanpat Rai & Sons.
2. S.K.Garg, Water & Waste water Engineering- Vol II, S.K.Garg, Khanna Publishers.
3. Dr. P.N. Modi., Sewage treatment and disposal, Standard Book House.
4. G.S.Birde & J.S.Birde, Water supply and Sanitary Engineering, Dhanpat Rai & Sons.
5. Duggal, Water supply and Sanitary Engineering, S.Chand & Company (Pvt) Ltd.
6. Dr.B.S.N. Raju., Water supply and Waste Water Engineering, TaTa Mc.Graw Hill.
7. Metcalf & Eddy, Waste Water Treatment, disposal and Reuse, TaTa Mc.Graw Hill, Tenth Reprint 1990, 2nd edition.
8. Hammer and Hammer Jr, Water and Wastewater Technology, Prentice Hall India,4th edition, 03.
9. Fair / Geyre / okun, Water & Waste water Engineering -Voulme-2, Wiley Toppan.

B.TECH. (CE)V SEMESTER**EURCE 511 : GEOTECHNICAL ENGINEERING LABORATORY – I**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 511	CE			3	3	40	60	100	2

I. Water Content Determination:

- 1) Oven Drying Method
- 2) Rapid/ Speedy Moisture Meter(Subject to availability)

II. Atterberg's Limits (LL / PL /SL)

- 3) Liquid Limit Test
- 4) Plastic Limit Test
- 5) Shrinkage Limit Test

III. Field density:

- 6) Core Cutter Method
- 7) Sand replacement method.

IV. Grain size analysis:

- 8) Sieve Analysis
- 9) Sedimentation Analysis.

V. Specific gravity:

- 10) Pycnometer Method
- 11) Density bottle method.

VI. Permeability of soil:

- 12) Variable head permeameter test

VII. Compaction of Soil:

- 13) I.S. Light Weight Compaction Test
- 14) I.S. Heavy Weight Compaction Test

DEMONSTRATION EXPERIMENTS :

- 1) Consolidation Test.

B.TECH. (CE) V SEMESTER**EURCE 512: FLUID MECHANICS LABORATORY-II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 512	CE			3	3	40	60	100	2

1. Characteristics of a hydraulic jump.
2. Open channel Transitions.
3. Drag characteristics of a circular cylinder with its axis normal to the direction of flow.
4. Lift – Drag Characteristics of an airfoil.
5. Impact of a jet on a circular disc.
6. Performance characteristics of a Centrifugal pump.
7. Performance characteristics of a Reciprocating pump.
8. Performance characteristics of a Pelton Turbine.
9. Performance characteristics of a Francis Turbine.

Case Studies:

10. Case Studies of Construction and Operation Details of Major Dams
11. Case Studies related to Open Channel Flow, Hydraulic Machines and Water Resources Engineering

B.TECH. (CE) V SEMESTER**EURCE 513: ENVIRONMENTAL ENGINEERING LAB.-II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 513	CE			3	3	40	60	100	2

Experiments on :

- (1) Determination of Total Solids, Suspended solids, dissolved solids, fixed and volatile solids.
- (2) Determination of Settleable Solids
- (3) Determination of Dissolved oxygen.
- (4) Determination of B. O. D.
- (5) Determination of C. O. D.
- (6) Determination of Total Nitrogen- Khezadal method.
- (7) Determination of Chlorides
- (8) Determination of Sulphates
- (9) Determination of Phosphates.

B.TECH. (CE) V SEMESTER**EURCE 514 ADVANCED COMMUNICATION SKILLS AND ENGLISH LANGUAGE LAB**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 514	HS			4	4	-	100	100	2

Unit - I

Report writing: Types of reports, Writing technical reports and scientific papers , Writing a Statement of Purpose

Unit - II

Presentation Skills: Make effective presentations, expressions which can be used in presentations, use of non-verbal communication, coping with stage fright, handling question and answer session, Audio-visual aids, PowerPoint presentations., Seminar Skills

Unit - III

Interview Skills: planning and preparing for interviews, facing interviews confidently, use of suitable expressions during interviews.

Unit - IV

Group Discussion: objectives of a GD; Types of GDs; Initiating, continuing and concluding a GD.

Unit - V

Debate: difference between debate and group discussion, essentials of a debate, conducting a debate.
Telephone Etiquette

English Language Laboratory

Introduction to Phonetic Transcription: Phonemes: Vowels, Consonants and Diphthongs
Syllabification
Weak and Strong Forms
Word Stress

Difficulties of Indian Speakers of English: Sound, Stress and Intonation Problems

Use of Dictionary: To Develop Pronunciation

Fluency and Continuous Speech: Problems
(Fluency Techniques, Pauses, Intonation,
Styles of Speech - Formal and Informal)

Prescribed Book:

Language Lab Manual, Department of English, GITAM University, 2012.

Reference Books:

1. E. Suresh Kumar et al, **A Handbook for English Language Laboratories** (With CD), Cambridge University Press India Pvt Ltd. 2009.
2. Edgar Thorpe, **Winning at Interviews**, Pearson Education, 2006.
3. Hari Mohan Prasad, **How to prepare for Group Discussions and Interviews**, Tata McGraw Hill, 2006.

B.TECH. (CE) VI SEMESTER**EURCE 601: REINFORCED CONCRETE STRUCTURES –II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 601	CE	3	1		4	60	40	100	3

Limit State Method:**UNIT-I:**

Design of staircase supported on two beams/walls. Footings: types of footings. Distribution of base pressure. General Design considerations for footings. Design of Isolated rectangular and square footing, Design of combined rectangular footing (for two columns only).

UNIT-II:

Retaining Walls: Types of retaining walls, forces on retaining walls, stability requirements, Preliminary proportioning of cantilever/ counterfort retaining walls. Design of cantilever and counterfort retaining walls.

UNIT-III:

Piles and pile caps: Design of bored cast-in-situ piles (bearing and friction types), under reamed piles. Design of Pile cap for three and four piles using bending method.

UNIT-IV:

Water Tanks: (working stress method): Impermeability requirements, Design of rectangular and circular water tanks resting on ground, under ground.

UNIT-V:

Introduction to Pre-stressed concrete: High strength concrete and high tensile steel – tensioning devices – pretensioning systems – post tensioning systems - Analysis of prestress – losses of prestress.

Reference:

1. P.C.Vargheese, Limit state Design of Reinforced Concrete, Prentice Hall India, 2nd edition.
2. S.N.Sinha, Reinforced Concrete Design, Tata Mc.Graw Hill, 5th Reprint 1995.
3. Pillai & Menon, Reinforced Concrete Design, Tata Mc.Graw Hill, 6th Reprint 2005.
4. A.K.Jain, Reinforced Concrete Design (Limit state design), Nem Chand & Bros, Roorkee, 3rd edition, reprint 1990.
5. P.C.Vargheese, Advanced Reinforced Concrete Design, Prentice Hall India, 2nd printing 2002.
6. Krishna Raju.N, “Prestressed Concrete”, Tata Mc.Graw Hill, 2000

B.TECH. (CE) VI SEMESTER**EUR CE 602: STEEL STRUCTURES–II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 602	CE	3	1		4	60	40	100	3

UNIT-I:**Plate Girders:**

Components of a plate girder, Economical depth, Design of flanges, Design of cross section of Plate Girders, Design of connection.

UNIT-II:

Plate Girders: Web stiffeners- Design of Vertical, horizontal and Bearing stiffener. Web splice.

UNIT-III:

Roof Trusses: Types of trusses, Economical spacing of roof trusses, loads on roof trusses, Estimation of wind load on roof trusses as per IS:875. Design of members of roof truss and joints, Design of purlins.

UNIT-IV:

Column bases and foundations: Slab base, Gusset base and Grillage foundations for axially loaded columns.

UNIT-V:

Plastic analysis: Introduction, Upper and Lower bound theorems, Shape factor, collapse loads for beams (simply supported, propped cantilever, fixed and two span continuous beams), collapse loads for frames

* All designs confirming to latest revised IS-800

Text Books:

- 1) S . K . Duggal, Design of Steel Structures –Tata McGraw Hill
- 2) .S.Bhavikatti, Design of Steel Structures – I.K.International Publishing HousePvt. Ltd

References:

- 1) N.Subramanian, Design of Steel Structures, Oxford University Press
- 2) K.S.Sai Ram, Design of Steel Structures, Pearson Education
- 3) Limit State Design of steel structures IS:800-2007-V.L.Shah and Veena Gore, Structures Publications, Jai – Tarang, 30 Parvati, Pune
- 4) Ramachandra, Design of Steel Structures, Standard Book

B.TECH. (CE)VI SEMESTER**EURCE603: GEOTECHNICAL ENGINEERING – II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 603	CE	3	1		4	60	40	100	3

UNIT I

Shear Strength of Soils : Stress at a point, Mohr circle of stress, Mohr coulomb failure theory shear tests – shear box, unconfined compression, tri-axial compression tests, field vane shear tests, shear parameters, types of shear tests in the laboratory based on drainage conditions, shear strength of sands, critical void ratio and dilatancy, shear strength of clays, total stress analysis and effective stress analysis, Skempton's pore pressure coefficients.

UNIT II

Shallow foundations: Safe bearing capacity and allowable bearing pressure, Terzaghi's bearing capacity equations its modifications for square, rectangular and circular foundation, General and local shear failure conditions. Factors affecting bearing capacity of Soil. Allowable bearing pressure based on N-values. Bearing capacity from plate load tests. Factors effecting locations of foundation and design considerations of shallow foundations, choice of type of foundations. Foundations on expansive soils.

Settlement analysis : causes of settlement, Computation of settlement, allowable settlement. Measures to reduce settlement.

UNIT III

Pile Foundations: Types, Construction, load carrying capacity of single pile – Dynamic Formula, Static formula, Pile load tests, Load carrying capacity of pile groups, settlement of pile groups, Negative skin friction.

Caissons : introduction , various forces acting and Types of caissons, box/ open/ pneumatic caissons, Different shapes and cross sections of well foundations. Different Components of well, Grip length, problems in well sinking and remedial measures.

UNIT IV

Earth Pressure: Types of Earth pressures, Rankines Active and Passive earth pressure, Smooth Vertical wall with horizontal backfill. Extension to Coloumb's wedge theory, Rebhann's graphical method for active earth pressure.

Bulkheads– introduction and Classification. Introduction to ground improvement techniques.

UNIT V

Stability Analysis of Slopes: Finite Slopes, Fellinius method of locating critical slip centre, Friction circle method of stability analysis and Taylors stability number, types of failure of finite slopes – Toe, slope and Base failure. Factors influencing Slope Stability.

Note: This course does not cover structural design of foundations.

Reference books:

1. Shamsher Prakash, Gopal Ranjan and Swami Saran, Analysis, Design of Foundations and Earth retaining Structures, M/S. Saritha Prakashan, Meerut.
2. J. E. Bowles, Foundation Analysis and Design, Mcgraw Hill, Publishers.
3. K.R. Arora, Soil Mechanics and Foundation Engg, Standard Publications, 6th edition, reprint 2005.
4. B.C. Punmia (SI-units), Soil Mechanics & Foundations, Lakshmi Book house, 9th edition, 1985

**B.TECH. (CE) VI SEMESTER
EURCE 604: WATER RESOURCES ENGINEERING – I**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 604	CE	3	1		4	60	40	100	3

UNIT-I:

Surface Water Hydrology: Water Resources in India, Hydrology in water Resources Planning –Precipitation – Types, Measurement of rainfall, Average depth of rainfall over an area, Mean annual rainfall, consistency of rainfall record, Double mass curve; Infiltration – Factors affecting and its determination, Evaporation and Evapo-Transpiration. Runoff – factors affecting runoff, methods of determination of runoff, stream gauging.

UNIT-II:

Hydrograph analysis: Base flow separation, Unit Hydrograph – Hydrograph of different durations, applications of unit hydrograph, S-hydrograph, Flood Forecasting Techniques.

Ground Water Hydrology: Mechanics of interstitial flow, definitions, sub surface distribution of water, types of aquifers, ground water movement, Darcy's law, Well hydraulics – steady flow into wells in Un-confined and confined aquifers, determination of hydraulic properties of aquifer, pumping test and recuperation test methods for determination of yield of open well.

UNIT-III:

Reservoir Planning: Types of reservoir investigations for reservoir planning, selection of site for a reservoir, zones of storage in a reservoir, reservoir yield, mass curve and demand curve, determination of reservoir capacity, yield from a reservoir of given capacity, operating schedules, guide curve for reservoir operation, apportionment of total cost of a multi purpose project, reservoir sedimentation, control of reservoir sedimentation, useful life of a reservoir.

UNIT-IV:

Irrigation: Definition of irrigation, types of irrigation systems – direct and indirect, lift and inundation irrigation system, methods of irrigation – surface and sprinkler methods, drip irrigation, Soil moisture constants, depth of water held by soil in root zone. Water requirements of crops, Duty, Delta, Base period and their relationship, crop seasons, factors affecting duty and methods of improving duty, consumptive use of water, determination of canal capacities for cropping patterns.

UNIT-V:

Canal Systems: Classification of irrigation canals – canal alignment, design of unlined canals, regime theories – Kennedy's and lacey's theories, tractive - force method, design problems – balancing depth of canal.

Text Books:

1. P.N.Modi, Irrigation, Water Resources and Water Power Engg., Standard Book House, Delhi.
2. B.C. Punmia and Pande B.B.Lal, Irrigation and Water Power Engg., Laxmi Publications Pvt. Ltd., New Delhi.

Reference Books:

1. S.K. Garg, Irrigation Engineering and Hydrology Structures, Khanna Publishers, Delhi-6.
2. Dr. P. Jayarami Reddy, A Text book of Hydrology, Laxmi Publication, Delhi.
3. K. Subramanya, Engineering Hydrology, Tata-Mc Graw Hill Publishing, Delhi.

B.TECH. (CE) VI SEMESTER
EURCE 605: TRANSPORTATION ENGINEERING – I

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 605	CE	3	1		4	60	40	100	3

UNIT-I:**Highway Development & History Of Roads:**

History of development of roads, Highway Development in India, Classification of Roads, Planning Surveys, Highway Alignment, Engineering Surveys for Highway Alignment.

UNIT-II:**Highway Geometric Design:**

Highway Cross-Sectional Elements, Stopping Sight Distance, Overtaking Sight Distance, Intermediate Sight Distance, Camber, Super elevation, Extra Widening, Setback Distance at horizontal curves, Design of horizontal curves, Transition curves, Vertical curves.

UNIT-III:**Pavement Design:**

Design of Pavements: Design of Flexible Pavement by C B R method as per IRC 37-2002 and theory of empirical mechanistic method. Stresses in Rigid pavement by Westergaards and IRC methods. Design of Overlay by Benkelman Beam method.

UNIT-IV:

Highway Materials, Construction & Maintenance: Highway materials: Aggregate properties and tests, Bitumen properties and tests. Highway Construction: Earthen roads, WBM roads, bituminous roads and Cement Concrete Roads. Highway Maintenance: Failure of Flexible and Rigid pavements and their maintenance. Highway Drainage: Surface and Sub surface Drainage System.

UNIT-V:

Traffic Engineering: Traffic Characteristics: Road User Characteristics and Vehicle Characteristics. Traffic Studies: Traffic Volume study, Speed studies and Origin and Destination studies.
Traffic Control Devices: Signs, Signals & Markings and Traffic Islands. Intersection: Unchannelised and Channelised Intersections and Rotary Intersections.

Reference Books:

1. Khanna & Justo, Highway Engineering, Nem Chand & Bros, Roorkee, 5th edition, reprint 1984.
2. Dr. L.R. Kadiyali & Dr. N.B.Lal, Principles and Practice of Highway Engineering, Khanna Publication.
3. Partha Chakraborty & Animesh Das, Principles of Transportation Engineering, Prentice Hall of India Publications.
4. S.P. Bindra, Highway Engineering, Dhanpatrai Publications.
5. L.R.Kadiyali, Traffic Engineering, Khanna Publishers, 7th edition 2007.
6. C. Jotin Khisty & B. Kent Lal, Introduction to Highway Engineering, Prentice Hall India.
7. Khanna & Justo, Highway Material Testing, Nemeserd and Brother Publications.

B.TECH. (CE) VI SEMESTER**EURCE 606: PROJECT ESTIMATION AND CONTRACTS**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 606	<i>CE</i>	3	1		4	60	40	100	3

UNIT-I:

Introduction: Errors in estimation, types, related terms in estimate, Contingencies, different types of approvals, rules, Units of measurement of different items of work.

Specifications: Meaning, purpose, types of Specifications, General specification, Detailed specifications of different items of buildings.

UNIT-II:

Contracts: Definition, Element of contract, offer acceptance and consideration, valid contract, Types of contracts – Lumpsum contract, schedule contract, Item rate contract, sub-contracts, joint ventures, Muster Roll Form 21. Piece work Agreement form, work order.

Tender – Definition – Quotation, Earnest money- Security money, Tender notice, Tender form, Bidding procedure, Irregularities in Bidding, award, Arbitration- Disputes settlement.

UNIT-III:

Detailed estimate of buildings: Different items of works in building, detailed measurement form, Estimate of RCC building - long walls - short wall method and Centre line method

UNIT-IV:

Rate analysis: Data sheet for materials and various items of work in buildings, schedule of rates, abstract estimate of buildings.

UNIT-V:

Roads: Estimation of earth work; different formulae for calculations, Concrete Roads, Bituminous Roads.

Introduction to Bar bending schedule, beams.

Reference Books :

1. M.Chakraborti., Estimation, Costing, Specifications and Valuation in Civil Engineering, 17th editions, 2004
2. B.N. Dutta., Estimating and Costing in Civil Engineering, VBSPD Publishers, 16th reprint 1996.
3. Textbook of estimating and costing (Civil Engg.) by G.S. Birde.
4. V N Vazirani & S P Chandola, A Text book of Civil Engineering Estimation and Costing, Khanna Publishers, 3rd edition, 2001.
5. D.D. Kohli and R.C. Kohli, Textbook on Estimating, Costing and Accounts (Civil).
6. Guna and Sen Gupta, Construction Management Planning.

B.TECH. (CE) VI SEMESTER**EURCE 611: SURVEY CAMP**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 611	PW			--		50	50	100	2

B.TECH. (CE) VI SEMESTER**EURCE 612: GEOTECHNICAL ENGINEERING LABORATORY-II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 612	CE			3	3	40	60	100	2

1. Field identification & classification of soils
2. Relative density test
3. Differential free swell test
4. Swell Pressure test.
5. Direct shear test
6. Unconfined compression test
7. Tri-axial test
8. Determination of Group Index Value.
9. Determination of CBR Value.

Demonstration Experiments

10. Plate Load Test (subject to availability)
11. Standard Penetration Test
12. Static Cone Penetration Test (subject to availability)
13. Dynamic Cone Penetration Test (subject to availability)
14. Other Miscellaneous Tests.

B.TECH. (CE) VI SEMESTER**EURCE 613: TRANSPORTATION ENGINEERING LABORATORY-I**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 613	CE			3	3	40	60	100	2

1. TESTS ON AGGREGATE:

- 1.1 Specific gravity
- 1.2 Sieve analysis
- 1.3 Flakiness index
- 1.4 Elongation index
- 1.5 Crushing value
- 1.6 Impact value
- 1.7 Abrasion value.

2. TESTS ON BITUMEN:

- 2.1 Specific gravity
- 2.2 Penetration
- 2.3 Softening point
- 2.4 Ductility
- 2.5 Flash and Fire point.

3. TESTS ON SOILS:

- 3.1 California Bearing Ratio Test

REFERENCE BOOK: Highway material testing by Khanna & Justo.

B.TECH. (CE) VI SEMESTER**EURCE 614: PERSONALITY DEVELOPMENT**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 614	HS			3	3				0

CRT material shall consists of

UNIT-I: Verbal Ability 1

UNIT-II: Reasoning 1

UNIT-III: Quantitative Aptitude

UNIT-IV: Geometry

UNIT-V: Mock Tests, Interview & Group Discussion

B.TECH. (CE) VII SEMESTER
EURCE 701: WATER RESOURCES ENGINEERING–II

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 701	<i>CE</i>	3	1		4	60	40	100	3

UNIT– I:

Storage Works: Classification of dams, factors governing selection of type of dam, selection of site for a dam, preliminary investigations. **Gravity Dams:** Forces acting on a gravity dam, stability criteria, modes of failure-elementary and practical profiles, stability analysis, stress analysis, construction joints, openings in dams-galleries, foundation treatment of gravity dam.

UNIT– II:

Earth Dams: Types, foundation for earth dams, design of earth dams, causes for failure of earth dams, criteria for safe design, phreatic line, seepage analysis – seepage control through body and foundation. **Spillways:** Essential requirements, spillway capacity, components, types of spillways and their working, design of ogee spillway, spillway crest gates, energy dissipation below spillway, scour protection, use of hydraulic jump as energy dissipater, Stilling basins, IS standard basins.

UNIT – III:

Diversion Head Works: Location and components, effects of construction of weirs on permeable foundation, Bligh’s, Lane’s and Khosla’s theories, weirs and barrages, Design of weirs on permeable foundations. **Regulation Works:** Canal falls, definition, necessity and location, classification of falls, design principles of Notch fall.

UNIT – IV:

Canal Regulator: Types, Design of Canal Head Regulator and Cross Regulator

Cross Drainage Works: Types, factors affecting the suitability of each type, Design principles of Aqueduct (Type-III).

UNIT – V:

River Engineering: Classification of Rivers, River Training and its objectives, Classification of River Training Works, Methods for River Training, Marginal Embankments or Levees, Guide Banks or Guide Bunds, Groynes or Spurs, Cutoffs, Bank Pitching and Launching Aprons.

Water Power Engineering: Development of hydro power in India, assessment of available power, utilisation factor, load factor, diversity factor, storage and pondage, types of hydro power schemes, components of hydel schemes – forebay, intake structure, trash racks, water hammer, surge tanks, sub structure and super structure of power house.

Text books :

1. P.N.Modi, Irrigation, Water Resources and Water Power Engineering, Standard Book House, Delhi-6.
2. B.C.Punmia and Pande B.B.Lal, Irrigation and Water Power Engineering, Laxmi Publications Pvt. Ltd., New Delhi.

Reference books:

1. S.K.Garg, Irrigation Engineering, and Hydraulic Structures, Khanna Publishers, Delhi-6.
2. R.S.Varshney, S.C. Gupta, and R.L. Gupta, Theory & Design of Irrigation Structures, Vol.II, Nem Chand & Bros., Roorkee, Sixth edition.

B.TECH. (CE) VII SEMESTER
EURCE 702: TRANSPORTATION ENGINEERING – II

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 702	CE	3			3	60	40	100	3

UNIT-I:

Railway Engineering-I: Historical Development of Railways in India, Advantages of Railways, Classification of Railways, Permanent Way & its components, functions. Track volume and Track capacity.

UNIT-II:

Railway Engineering-II: Rail Joints, Welding of rails and Creep of rails. Track Geometric Design, Gradients, Horizontal and Vertical curves, super elevation, Negative Super elevation, Coning of Wheels,

UNIT-III:

Railway Engineering-III: Turnouts: Left Hand Turnout, Track Junctions, Points and crossings, Tracks Drainage, Railway Stations and Yards, Signaling.

UNIT-IV:

Dock And Harbour Engineering: Layout of Port, Components and Functions, Classification of Ports, Harbour and its classification, Site selection of ports & harbours, Natural phenomenon - Tides, Wind, Waves & Currents, Navigational aids.

UNIT-V:

Airport Engineering: Layout of Airports, Aircraft components and functions, Aircraft characteristics, Airport site selection, Airport obstructions, Wind rose Diagram, Runway design, Taxiway.

Referece Books:

1. S.C. Saxena & S Arora, Railway Engineering, Dhanpatrai Publications, 6th edition, Reprint 2004.
2. Srinivasan, Docks & Harbour Engineering, Charotar Publishing House, 7th edition, 1983.
3. S.K. Khanna & M.G. Arora & S.S. Jain, Airport Planning & Design, Nem Chand & Brothers – 1994, Roorkee, 5th Edition

B.TECH. (CE) VII SEMESTER**EURCE 703: CONSTRUCTION MANAGEMENT**

Course Code	Category	Hours of Instruction per			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 703	HS	3	1		4	60	40	100	3

UNIT-I

PERT and CPM : Introduction : Origin of PERT and CPM, Planning, Scheduling and controlling, Barcharts, Milestone charts, weaknesses in Barcharts, PERT and CPM networks – Comparison, Event, Activity, Rules for drawing networks, Numbering the events (Fulkerson’s law), Dummy activities.

UNIT-II

CPM-PERT- Network Analysis : Time estimate-Expected time, Earliest allowable occurrence time, Latest allowable occurrence time, slack, project duration, probability of completion, Start and Finish time estimates, Floats, Project scheduling, Critical and sub-critical path. Updating – Process of updating; when to update.

UNIT-III

CPM Cost Model & Resources allocations, resource scheduling : Cost Analysis; direct and indirect costs, operation time, Normal and crash times and costs, optimising project cost, crash limit, Free float limit, Optimization. Resource smoothening. Resource levelling.

UNIT-IV

Management – Scope of Construction Management; Significance of Construction Management; Concept of Scientific Management; . Safety in Construction.

Qualities of Manager; The roles/functions performed by effective and competent Managers;

The Manager: i) as a decision maker; ii) as a motivator, iii) as a communication-link; iv) as a conflict-resolver; v) as a well – wisher of co-employees and the employer; etc.

UNIT-V

Organization – Types of organization; Merits and demerits of different types of organization – Authority –Policy – Labour Problems; Labour Legislation in India; ‘Workmen’s compensation Act of 1923 and Minimum Wages Act of 1948’, and subsequent amendments

Reference Books;

1. L. S. Srinath, PERT and CPM, Afflicted East West Press Pvt. Ltd, 2nd Edition 1975
2. PERT and CPM – Punmia, Laxmi Publications, 3rd edition 1987.
3. Guha and Sen Gupta, B, Construction Management and Planning.
4. A Shapero, Managing Professional People: Understanding Creative Performance.
5. Groups-G Egan, Interpersonal living: A Skill/Contract Approach to Human Relations Training.
6. U.K. Shrivastava, Construction Planning and Management–New Delhi, Galgotia Publications –1999.

B.TECH. (CE)VII SEMESTER**EURCE 711: COMPUTER APPLICATIONS IN CIVIL ENGINEERING (CACE)**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 711	CE			3	3	40	60	100	2

UNIT-I:

Structural Analysis and Design

1. Introduction to STAAD Pro Software and Basic Beam Analysis
2. Analysis of RC Plain and Three dimensional frames.
3. Analysis and Design of structures subjected to Wind and Earthquake Loads.
4. Analysis and Design of Steel Truss.
5. Design of structural components – Slabs, Footings, Pile caps, Retaining walls(Using NISA civil software).

UNIT-II:

Geological Information Systems

1. Land use, Land cover, Hydromorphology, Network of roads using GIS Software/ (ESRI or ILWIS)
2. DEM Generation using digital photogrametry software/ using PHOTOMOD/ ERDAS Leica.

UNIT-III:

Pipe network application: EPANET

UNIT-IV:

Project Management Application: MS Projects/Primavera

* Note: Students should learn any three software packages.

EURCE 712: NON - DESTRUCTIVE TESTING LABORATORY

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 712	CE			3	3	40	60	100	2

1. Assessment of Compressive Strength by Rebound Hammer Test.
2. Assessment of Compressive Strength by UPV Test.
3. Measurement of Cover and Bar Diameter by Profometer.
4. Measurement of Corrosion of reinforcement by Half Cell Potential measurements.
5. Measurement of Crack Width of RC Beams.
6. Measurement of Surface Strains of RC Beam under external loading.
7. Plotting of Stress-Strain Curve for Concrete.
8. Rapid estimation of Compressive Strength of Concrete.
9. Carbonation Test.
10. Determination of Chloride content in cement concrete.

B.TECH. (CE) VII SEMESTER**EURCE 713: TRANSPORTATION ENGINEERING LABORATORY-II**

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 713	CE			3	3	40	60	100	2

LABORATORY TESTS:

1. Bituminous mix design by Marshall Stability test.
2. Determination of Bitumen content by centrifuge extractor.
3. Stripping value test for bitumen.

FIELD TESTS / DEMONSTRATION TESTS:

4. Pavement structural evaluation by Benkleman beam test.
5. Field CBR test.
6. Traffic Volume Studies
7. Spot Speed Studies
8. Determination of roughness of the pavement by Bump Integrator.

REFERENCE BOOKS:

1. Highway material testing by Khanna and Justo, Nem Chand & Brothers, 4th Edition-1989
2. Principle of transportation engineering by Partha Chakraborty and Animesh Das, New Delhi, Prentice Hall of India - 2003
3. Principles of pavement design by Yoder and Lit Zorck.
4. Pavement material by Huang.

B.TECH. (CE) VII SEMESTER EURCE 714: PROJECT

Code No	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End exams	Continuous Evaluation	Total	
EURCE 714	PW			4	4	50	50	100	2

EURCE 715: INDUSTRIAL TRAINING

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 715	IT						100	100	2

EURCE 721 -727: DEPARTMENTAL ELECTIVE – I

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 721-727	DE	3	1		4	60	40	100	4

B.TECH. (CE) VII SEMESTER**EURCE 721: Elective-I: ADVANCED REINFORCED CONCRETE STRUCTURES-I****UNIT-I:**

Yield Line Analysis: Analysis and Design of Slabs using yield line theory. Slabs supported on four edges, three edges and two opposite edges subjected to uniformly distributed load.

UNIT-II:

Grid Floor: Analysis and Design of Grid Floors as per IS Code and more rigorous method.

UNIT – III:

Design of Bunkers

UNIT – IV:

Design of silos, Slipform construction and Silos

UNIT-V:

Flat Slabs – Different Components of a Flat Slab, Direct Design Method, Bending Moments in the interior and end Spans.

Reference books:

1. N. Krishnam Raju, Advanced Reinforced Concrete designed, CBS Publishers & Distributors, First Reprint, 1988.
2. P. Dayaratnam, Design of Reinforced Concrete Structures, Oxford & IBH Publishing Co., 4th edition, reprinted 2002
3. Park and Pauly, John Wiley & Sons, Reinforced Concrete Structures.

B.TECH. (CE) VII SEMESTER**EURCE 722: Elective-I: MULTI-STOREYED STRUCTURES****UNIT-I:**

Analysis of Gable frames by Moment Distribution Methods with and without sway.

UNIT-II:

Introduction to Matrix methods: Analysis of continuous beams and single bay single storey portal frames by stiffness method.

UNIT-III:

Analysis of single bay single storey portal frames and continuous beams by Flexibility matrix methods.

UNIT-IV:

Analysis of Multistoreyed frames by substitute frame method.

UNIT-V:

Analysis of Multistoreyed frames for wind loads by portal, cantilever and Girder Factor methods.

Reference:

1. V.N. Vazirani & M.M.Ratwani, Analysis of Structures Vol.II, Khanna Publishers, Fifty reprint, 2004.
2. S.P. Gupta, G.S.Pandit, R. Gupta, Theory at Structures, Vol.II, Tata McGraw Hill, Second Reprint 2003.
3. S.S.Bhavikatti, Structural Analysis Vol.II, Vikas Publishing House Pvt. Ltd, Second Edition, 2005.

B.TECH. (CE) VII SEMESTER**EURCE 723: Elective-I: DESIGN OF BRIDGES****UNIT-I :****Introduction & Investigation for Bridges**

Components of a Bridge; Classification; Standard Specifications; Need for Investigation; Selection of Bridge Site; Preliminary Data to be collected; Preliminary Drawings; Determination of Design Discharge; Economical Span; Location of Piers and Abutments; Vertical clearance above HFL; Scour depth; Choice of Bridge Type; Importance of Proper Investigation.

UNIT-II:**Concrete Bridges**

Various types of bridges; I.R.C. Specification for road bridges

Culverts

Design of R.C.slab culvert.

UNIT-III:**T-Beam Bridge**

Pigeaud's method for computation of slab moments; Design of simply supported T-beam bridge.

UNIT-IV:**Sub Structure for Bridges**

Pier and abutment caps; Materials for piers and abutments; Design of pier; Design of abutment; Backfill behind abutment; Approach slab

UNIT-V:**Bearings for Bridges**

Importance of bearings; Bearings for slab bridges; Bearings for girder bridges; Expansion bearings; Fixed bearings; Design of elastomeric pad bearing.

Foundations for Bridges

Scour at abutments and piers; Grip length; Types of foundations; Design of well foundation

Reference:

1. D. Johnson Victor, Essentials of Bridge Engineering, Oxford & IBH Publishing Co.Pvt.Ltd, 5th Edition 2001.
2. Krishna Raju.N, Design of Bridge Structures, Oxford and IBH Publishing.
3. Jagadish.T.R and Jayaram.M.A, Design of Bridge Structures, PHI Learning Pvt. Ltd.
4. Ponnuswamy.S, Bridge Engineering, Tata Mc Graw Hill Education.

B.TECH. (CE)VII SEMESTER**EURCE 724 Elective-I: DESIGN OF FOUNDATIONS FOR DYNAMIC LOADING****UNIT-I:**

Elements of Soil Dynamics: Free and forced vibrations with and without damping for single degree of freedom, natural frequency of foundation soil system – Barken, pressure bulb concept, Pauw's analogy.

UNIT-II:

Wave Propagation: Waves in elastic half space, Elements of seismic methods, steady state vibrations.

UNIT-III:

Elastic Properties of Soil: Field and Laboratory methods, stress strain characteristics of soil under dynamic loads, damping properties.

UNIT-IV:

Bearing capacity of soil : Under dynamic loads by pseudo static analysis and vibration Isolation.

UNIT-V:

Liquefaction: Mechanism, Laboratory methods, Evaluation of liquefaction in the field, factors affecting liquefaction, Anti liquefaction measures, earthquake zones.

References:

1. Swami Saran, Soil Dynamics & Machine Foundations
2. Shamsher Prakash, Soil Dynamics, 2nd Impression, 1964.
3. Srinivasulu. P. and Vydyanathan, Hand Book of Machine Foundations
4. Jumkies, Foundation Dynamics
6. Barken, Dynamics of Bases and foundations.
7. Richart, Vibration of Soil and Foundation
8. Relevant IS Codes.
9. Nayak, N.V., Foundations Design Mamual, Dhanpat Raj & Sons, 3rd edition, 1985

B.TECH. (CE) VII SEMESTER
EURCE 725 Elective-I: HYDRAULIC STRUCTURES

UNIT-I:

Gravity Dams: Forces acting on gravity dam, Elementary profile of a gravity dam, step by step method of determination of profile of a dam, safety criteria, stability analysis of gravity dam including earthquake effects, internal stress calculations, and stress distribution around openings in a gravity dam.

UNIT-II:

Earth Dams: Causes of failure of earthen dams, seepage analysis for homogeneous dams, stability analysis for earthen dam by slip circle method, ordinary method of slices and Bishop's method.

UNIT-III

Floods: Estimation of design flood, flood frequency analysis – Gumble's distribution method, Flood routing in reservoirs and rivers, Dam-break / breach flood routing – Flood control

UNIT-IV:

Water Conductor System: Intake Structure, Trash rack, Design of trash Rack, intakes through Concrete dam, Design of Intake Structure, Surge tank, Functions and types of surge tanks.

UNIT-V:

Spillways & Gates: Types of spillways, Design of ogee spillway profile, types of hydraulic gates, Components of radial gates, Design of radial gate.

Reference :

1. R.S.Varshney, "Concrete Dams" – Oxford & IBH Publishing Company (P) Ltd., New Delhi
2. Purnia.B.C, Pande. B. B. Lal, A. K. Jain, "Irrigation and Water Power Engineering", Laxmi Publications, New Delhi.
3. T.W.Lambe and R.V.Whitman, "Soil Mechanics", J.I.Version, John Wiley & Sons.
4. Ven Te Chow, D. R. Maidment and L.W. Mays, "Applied Hydrology", Mc Graw-Hill Books company, New Delhi.
5. Jaya Rami Reddy. P, "Hydrology", Laxmi Publications (P) Ltd., New Delhi.
6. S. N. Ghosh, "Flood Control and Drainage Engineering", Oxford IBH Publications Company (P) Ltd., New Delhi.
7. K. L. Rao, "India's Water Wealth", Orient Longman Limited, New Delhi.
8. R. S. Varshney, "Hydro Power Structures", New Chand and Bros., Rookee.

B.TECH. (CE) VII SEMESTER**EURCE 726: Elective-I: ELEMENTS OF ENVIRONMENTAL SANITATION****UNIT-I:**

Origin and spread of Communicable diseases like Cholera, Smallpox, Tuberculosis, Malaria, Filariasis, and Plague – common methods. Role of Public Health Engineers in the preventive aspects of the above diseases – Role of vectors in transmitting diseases.

UNIT-II:

Rural water supply and sanitation – Sanitary protection of wells – springs, Economic methods of treatment.

UNIT-III:

Food Sanitation – Food poisoning /Food preservation sanitary maintenance of catering and eating establishments - market places - slaughter houses etc / milk and milk products - milk sanitation.

UNIT-IV:

Refuse sanitation – Quality and quantity of garbage, night Soil – methods of conveyance and sanitary disposal methods, latest technologies adopted to dispose of the solid wastes. Insect vector and Rodent control.

UNIT-V:

Institutional Sanitation: Sanitary Requirements and Maintenance of Public Places - Schools, hospitals, jails and offices.

Text Books:

1. Ehlers Steel., Municipal and Rural Sanitation, Tata McGraw Hill
2. Salvato, Environmental Sanitation, Tata McGraw Hill, Toppan Printing Company 1958.

B.TECH. (CE)VII SEMESTER**EURCE 727: Elective-I: ENVIRONMENTAL IMPACT ANALYSIS****UNIT- I:**

Introduction to EIA. Definition of E IA and EIS.C.E. guidelines in USA, preparation of EIS, Elements of EIA.

UNIT-II:

Agency Activities, Environmental setting. Environmental attributes, air, water, soil, ecology, noise Socio-Economic aspects, Culture and human aspects (Human settlements – rehabilitations).

UNIT-III:

Environmental impacts, Identification measurement, Aggregation, Secondary and Cumulative Impacts.

UNIT-IV:

Criteria for selection of methodology, impact assessment methodologies, procedure for reviewing environment impact statement.

UNIT-V:

Case studies, Economic impact analysis / Energy production impact analysis, cost benefit analysis, Environmental impact mitigation and control measures.

Reference Books :

1. Urban & Jain, Environmental Impact Analysis.
2. Canter, Environmental Impact Analysis –McGraw Hill Publishers, 2nd edition

B.TECH. (CE) VIII SEMESTER EURCE 811: PROJECT

Course code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End	Continuous	Total	
EURCE 811	PW			8	8	50	50	100	4

EURCE 831 - 836: DEPARTMENTAL ELECTIVE – II

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		End Exams Semester	Evaluation Continuous	Total	
EURCE 831-836	DE	3	1		4	60	40	100	4

EURCE 841- 846: DEPARTMENTAL ELECTIVE– III

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 841-846	DE	3	1		4	60	40	100	4

EURCE 8501 - 8524: INTER DEPARTMENTAL ELECTIVE – I

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Sem End Exams	Continuous Evaluation	Total	
EURCE 8502 - 8516, 8518,8522,8524	IE	3	1		4	60	40	100	4

EURCE 8601 – 8620: INTER DEPARTMENTAL ELECTIVE – II

Course Code	Category	Hours of Instruction per week			Total Hours	Marks			Credits
		L	T	P		Semester End Exams	Continuous Evaluation	Total	
EURCE 8602-8609, 8611-8614,8616-8619	IE	3	1		4	60	40	100	4

B.TECH. (CE) VIII SEMESTER
EURCE 831: ELECTIVE –II: INDUSTRIAL STRUCTURES

UNIT-I:

Connections: Design of Frame, seated moment resisting connections (both welded and riveted).

UNIT-II:

Analysis of Pitched (Gable) Portal frames, Assumptions, Bending Moment and Shear Force diagrams. Design of portal frame (dead, live and wind loads).

UNIT-III:

Analysis and design of gantry girders, Steel Bracket connection design.

UNIT-IV:

Towers, Principles of Analysis and Design of Lattice towers, Transmission towers. Design of lattice towers and transmission towers (only sessional work).

UNIT- V :

Analysis of Mill Bends.

Reference Books:

1. M.Raghupati, Design of Steel Structures.
2. Arya and Azmani, Design of Steel Structures, Nem Chand & Bro's, 4th edition 1989.
3. P. Dayaratnam, Design of Steel Structures, A.H.Wheeler & Co., 2nd edition, 1996.
4. Kazmi and Zindal, Design of Steel Structures.

B.TECH. (CE) VIII SEMESTER**EURCE 832: Elective-II: ADVANCED REINFORCED CONCRETE STRUCTURES-II****UNIT-I:**

Deflection of Reinforced Concrete members: Introduction, Short-term deflection of beams, Deflection due to imposed loads, short-term deflection of beams due to applied loads, calculate deflection by IS 456.

UNIT-II:

Estimation of crack width in Reinforced Concrete Members: Introduction, factors affecting crack width in beams, Calculation of crack width, estimation of crack width in beams by IS 456.

UNIT-III:

Redistribution of Moments in Reinforced Concrete Beams: Introduction, Redistribution of moments in fixed beams, positions of points of contra flexure, conditions for moment redistribution, Final shape of redistributed bending moment diagram, moment redistribution for a two-span continuous beam, advantages and disadvantages of moment redistribution.

UNIT-IV:

Design of Staircases: Introduction to Helicoidal Staircases, Design of Helicoidal Staircases

UNIT-V:

Design of Reinforced Concrete Members for Fire Resistance: Introduction, grading or classifications, Effect of high temperature on steel and concrete, Effect of high temperature on different types of structural members, fire resistance by structural detailing from tabulated data, analytical determination of the ultimate bending moment, capacity of reinforced concrete beams under fire.

References:

1. P. C. Varghese, Advanced Reinforced Concrete Design, Prentice hall India, 2nd printing 2002.
2. Park & Paulay, Reinforced Concrete.

B.TECH. (CE) VIII SEMESTER
EURCE833:Elective-II:PRESTRESSED CONCRETE

UNIT-I:

Introduction to prestress, Basic concepts and terminology related to prestressing,. Materials for prestressed concrete - high strength concrete and high strength steel. Advantages of prestressed concrete.Tensioning Devices. Types of Prestressed concrete systems. Pretensioning systems - Hoyer's Long Line system, Post -Tensioning systems- (1) Fressinet System (2) Gifford Udall.

UNIT-II:

Assumptions in analysis of prestressed members, Resultant stresses at a section, Pressure or thrust line concept of load balancing, cable profile, kern distance, stress in tendons as per IS: 1343, cracking moment. Deflections - short term deflections in uncracked members.

UNIT-III:

Prestressing losses due to Elastic shortening, shrinkage and creep of concrete friction, slip of anchorage etc., as per IS: 1343 provisions.

UNIT-IV:

Design of flexural strength of symmetrical beams as per IS: 1343 provisions, shear and principal stresses, Design for shear as per IS: 1343 provisions.

UNIT-V:

Transfer of Prestress (Pretensioned members), Transmission length, bond stress, Transverse tensile stress, End Zone reinforcement, flexural bond stress, I.S. Code Provisions. (b) Anchorage zone in post tensioned members, stress distribution in end block, Guyon's method of approach of analysis of end block (Not more than 2 cables).

Reference Books:

1. P. Dayaratnam, Prestressed Concrete, Oxford & IBH Publishing, Reprint 1996.
2. T.Y. Lin and Ned. H. Burns, Design of Prestressed Concrete Structures, John Wiley & Sons, 3rd edition.
3. N. Krishna Raju, Prestressed Concrete, Tata McGraw Hill, 3rd edition, eleventh reprint 2003.

TECH. (CE) VIII SEMESTER**EURCE 834: Elective –II: GROUND IMPROVEMENT TECHNIQUES****UNIT-I:**

In-situ densification methods in granular soils – Introduction of Vibration at the ground surface, Impact at the Ground surface. Vibrofloatation technique and other techniques like dynamic replacement etc.

UNIT-II:

In-situ Densification methods in cohesive soils:- introduction, preloading, dewatering, sand drains, sand wicks, Geodrains/ band drains. Methods of dewatering systems – open sumps and ditches, well point system, deep well system, vaccum dewatering, Electro-Osmosis method.

UNIT-III:

Reinforced Earth: Principles, components of reinforced earth, factors governing design of reinforced earth walls. Geotextiles: Introduction, types of Geotextiles, Functions and their application.

UNIT-IV:

Stabilization of Soils: Soil aggregate mixture, properties and proportioning techniques, soft aggregate stabilization, compaction, field compaction control. Cement, lime and bituminous stabilization.

UNIT-V:

Stone Columns: Introduction, construction practice, design principles, Case studies indicating the efficacy and importance of ground improvement Technique.

Reference Books:

1. Robert M.Koerner: Construction and Geotechnical Methods in Foundation Engg, McGraw Hill
2. E. J. Yoder: Principles of pavement design, John Wiley and sons.
3. Leonards, G.A. Foundation Engineering.
4. Khanna S.K. and Justo C.E.G: Highway Engineering Nemchand Publications.
5. Sowers G.F.: Introductory Soil Mechanics and Foundations.
6. Hausemen: Principles of Ground improvement, Mcgraw Hill Publishing Co., New Delhi, 1999
7. Dr. P. Purushothama Raj: Ground Improvement Techniques, Laxmi Publication (P) Ltd, New Delhi, 1999.

B.TECH. (CE)VIII SEMESTER**EURCE 835: Elective –II: COASTAL ENGINEERING****UNIT-I:**

Mechanics of Wave Motion: Wave fundamentals and classification of waves, small amplitude wave theory, wave celerity, length, and period, orbital motions, pressure distribution, wave trains and wave energy, transformation of waves, higher order wave theories, stokes higher order wave theories, cnoidal wave theory, wave refraction, wave diffraction, wave reflection, wave breaking.

UNIT-II:

Tides, Storm surges, Tsunamis - Wave Prediction: Wave height variability, energy spectra of waves, directional spectra of waves, wind information needed for wave prediction, estimating the wind characteristics

UNIT-III:

Delineating a fetch, forecasts for lakes, bays, and estuaries, significant wave method, wave spectrum method, forecasting wind waves in shallow water, deep water relation for wave decay, hurricane waves.

UNIT-IV:

Littoral Processes: Ocean currents, long shore currents and setup due to ocean waves, sediment transport in the offshore zone, surf zone, bar-berm prediction and budget of the littoral zone.

UNIT-V:

Wave runup, over topping and transmission - Wave Forces: Wave forces on cylinders and walls.

References :

Ippen, A.T., Estuary and coastline hydrodynamics, Mc Graw – Hill book company Inc. Sorensen, R.M., Basic Coastal Engineering, John Wiley & Sons.

U.S. Army Coastal, Engineering Research Center, Shore protection manual, Vols. I, II and III.

B.TECH. (CE)VIII SEMESTER**EURCE 836: Elective-II: PRINCIPLES OF INDUSTRIAL WASTE TREATMENT****UNIT-I:**

Characteristics of waste water of specific industries, characteristics of treatment plant effluents, Effect of waste water on self purification capacity of streams, Primary treatment of waste water.

UNIT-II:

Principles of biological waste treatment: Facilities Microbiological growth rate kinetic equations, sludge production, oxygen requirements, continuous flow treatment models. Aerobic treatment studies in continuous and semi-continuous reactors. Anaerobic treatment, studies, Nitrogen and Phosphorus removal.

UNIT-III:

Process designs of the following units w.r.t. Industrial Wastes; Activated sludge process; trickling filter; sludge digestion units; Aerated lagoons; Stabilization ponds (oxidation ponds); oxidation ditches (Pasveer); Rotating Biological contactor; Anaerobic filter.

UNIT-IV:

Principles of Industrial waste Treatment: Waste reduction pretreatment of wastes, collection and segregation of wastes, reduction in volume and strength neutralisation; equalisation; proportioning.

UNIT-V:

Manufacturing processes, flowsheets; Characteristics and treatment of wastes and disposal methods of the following industries – Sugar, Dairy, Distillery, Paper, Tannery, Textile, Sheet, Fertiliser, Oil refinery and Petrochemicals.

References :

1. M.N. Rao and A. K. Datta; Waste Water Treatment.
2. Metcalf and Eddy; A waste water Engineering Treatment, disposal and Reuse –Tata Mc. Graw-Hill Co., 3rd edition, 1995.

**B.TECH. (CE) VIII SEMESTER
EURCE 841: ELECTIVE-III: FINITE ELEMENT METHOD**

UNIT-I:

Introduction of Finite Element method, Concept of an element, Various Element Shapes

UNIT-II:

Displacements models, element stresses and strains, direct formulations of element stiffness and loads.

UNIT-III:

Plane Stress/Strain Triangular elements, quadrilateral elements, modeling and mesh refinement.

UNIT-IV:

Construction of stiffness matrix and loads, boundary conditions

UNIT-V:

Finite Element modeling and solution techniques, symmetry in Finite Element method, nature of Finite Element method solution, errors, convergence and adaptively.

Books:

1. Zienkiewicz, O.C., and Taylor, R.L., The Finite Element method, Butterworth Heinemann, New Delhi, 2002.
2. Cook, R.D., et al, Concept and Applications of Finite Element Analysis, John Wiley & Sons, 2002.
3. Chandrakant. S. Desai, and John . F. Abel., Introduction to the Finite Element method, CBS Publishers & Distributors, New Delhi, 2002.
4. Chandraguptal, T.R. and Belegundu A.D., Introduction to Finite Elements in Engineering, Prentice Hall, Indian, Edn., 2003.

B.TECH. (CE)VIII SEMESTER

EURCE 842 : Elective-III: INTRODUCTION TO EARTHQUAKE ENGINEERING

UNIT-I:

Introduction of Structural Dynamics – Types of prescribed Loads – Analysis of Dynamical behaviour of Structures – Mathematical and Analytical Models – Degrees of Freedom. Single degree freedom — Free body diagram – Solution of Differential equation of Motion – Frequency, period and Amplitude – Logarithmic decrement – Simple Problems.

UNIT-II :

Un-damped and Damped Systems, Types of Damping Systems, Vibration measuring instruments,

UNIT-III:

Free Vibration of SDOF Systems – Response of SDOF System to Harmonic Excitation, Dynamic Excitation – Raleigh's method, Stodola method — Response Spectra.

UNIT-IV:

Mathematical model of MDOF Systems – Vibration of Un-damped two Degrees of Freedom system – Simple problems – Free vibration of MDOF System – Natural Frequencies & Mode shapes – mode Superposition method as per IS 1893 Code Provisions.

UNIT-V:

Introduction of Earth Quake Response of Structures – Response of SDOF and MDOF systems to earth quake excitation – Simple problems on SDOF system – Concept on Seismic Design -IS 1893 (1984)- Provisions for Seismic Design: Reinforcement detailing as per IS Code.

Reference Books:

1. Mario Paz, Structural Dynamics.
2. R.W. Clough & J. Penzien, Dynamics of Structures
3. Anil, K. Chopra, Dynamics of Structures
4. A.R. Chandrasekharan & Jaikrishna, Earth quake Engineering

B.TECH. (CE)VIII SEMESTER**EURCE 843: Elective-III: SOIL DYNAMICS AND MACHINE FOUNDATIONS****UNIT-I:**

Resonance and its effect – free and forced Vibrations with and without damping – Constant force and rotating mass type excitation – Magnification factor – Phase difference between forces and displacement for steady state vibrations – Logarithmic decrement.

UNIT-II:

Natural frequency of foundation soil system – Barkan's and I.S. methods of determining natural frequency. Tachehotarioff's reduced natural frequency.

UNIT-III :

Elastic properties of soil for dynamical purpose and related properties

UNIT-IV:

Types of machine foundations – General requirements, Permissible amplitudes and bearing pressures. Analysis and Design requirements of foundations for rotary, reciprocating and impact type of machine – as per I.S. codes.

UNIT-V:

Vibration isolation – types and methods of isolation - Active isolation and passive isolation. Dynamic properties of isolation materials. Case Studies pertaining to vibration problems of foundations.

References :

1. Srinivasulu and Vaidyanathan, Hand-book of machine foundations, M/s. Tata McGraw Hill Publications.
2. Relevant I.S. Codes.
3. B.C.Punmia, Soil Mechanics and Foundation Engineering, Standard Book House, 9th edition, 1985
4. Shamsher Prakash, Gopala Ranjan and Swamisaran, Analysis and Design of Foundations and Retaining Structure, M/s Saritha Prakashan, Meerut.
5. Richart Hall and Woods, Vibrations of soils and Foundations, Prentice Hall Inc.,New Jersey

B.TECH. (CE)VIII SEMESTER**EURCE 844: Elective-III: AIR POLLUTION AND ITS CONTROL****UNIT-I:**

Air Pollution and its definition – Factors influencing air pollution – Classification of pollutants -particulates – Gases-Sources of pollution – Air quality standards – effects – Location of Industries.

UNIT – II :

Meteorology – Wind roses – lapses rates – mixing depth- atmospheric dispersion – plums behavior-accumulation, estimation of pollutants – Effective stack height – Ambient air quality monitoring and stack monitoring.

UNIT-III:

Air Pollution effects on human beings, animals, plants and materials, Air Pollution Episodes in India and abroad.

UNIT-IV:

Air quality standards – effects – Location of Industries, Ambient air quality monitoring and stack monitoring.

UNIT-V:

Control of air pollution – Removal of pollutants – particulate and gaseous – Air pollution control equipments (units) such as settling chamber, cyclones, wet scrubbers/collectors, scrubbers, centrifugal scrubbers spray towers, packed beds, electrostatic precipitators, after burners-absorption – adsorption – Diffusion.

References :

1. T. Painter., Air Pollution Control Technology, Mc.Graw Hill
2. Prof. T. Shivaji Rao, Elements of Air Pollution Control
3. M.N.Rao. & H.V.N.Rao, Air Pollution and its Control, TaTa Mc.Graw Hill, 15th reprint, 2000
4. Dr. B.S.N. Raju, Fundamentals of Air Pollution, Oxford & I.B.H.
5. K.V.S.G Murali Krishna, Air Pollution and its Control, Kanghal & Co.,

B.TECH. (CE) VIII SEMESTER**EURCE 845: Elective-III: TRANSPORTATION PLANNING AND PAVEMENT DESIGN****UNIT-I:**

Transportation Planning Process: Introduction, System approach to Transportation Planning, Stages in transportation planning, and difficulties in transportation planning process.

UNIT- II:

Transportation Survey: Introduction, Definition of the study area, zoning, types of surveys, Inventory of transportation facilities, land use and economic activities.

UNIT- III:

Transport Demand Analysis: Introduction, trip purpose, factors governing trip generation and attraction, multiple linear regression analysis, trip distribution models-Gravity model. Modal split models- probit analysis, Traffic assignment models, all-or-nothing assignment model.

UNIT- IV:

Pavement Analysis: Introduction, Parameters of pavement analysis – Elastic modulus, Poisson's ratio, Wheel load, Wheel configuration and Tyre pressure. Analysis of Bitumen's Pavement Structure, layered elastic solution.

UNIT-V:

Pavement Design: Design of flexible pavements – theoretical, empirical and semi-empirical methods, Burmister, AASHO method, IRC method. Design of Rigid pavements -PCA method, AASHTO Design method.

Reference Books:

1. Partha Chakraborty and Animesh Das, Principles of Transportation Engineering.
2. Yoder and Wit Zork, Principles of Pavement Design.
3. Dr. L.R. Kadiyali, Traffic Engineering and Transportation Planning, Khanna Publishers, 7th Edition, 2007.
4. C. Jotin Khinsty and B. Kent Lall, Transportation Engineering

B.TECH. (CE) VIII SEMESTER**EURCE 846: Elective-III: REMOTE SENSING AND GEOGRAPHIC INFORMATION SYSTEMS****UNIT-I:****Fundamentals of Remote Sensing:**

Introduction, Electromagnetic radiation, Electromagnetic Spectrum, Energy interactions with Earth's surface materials and Atmosphere, Sensors and Platforms, False Colour Composite (FCC) image, Image interpretation techniques, Satellite remote sensing – Indian context.

UNIT-II: Fundamentals of GIS:

Introduction, Elements of GIS, Vectorization, Rasterization, Geo-referencing, Map Projections, Digitization Process, Data Base handling, Types of data structures, overlay analysis, surface terrain models – Digital elevation model (DEM), Triangulated irregular network (TIN), and Slope models.

UNIT-III:**RS & GIS Techniques for Natural resources Management:**

Landuse/land cover classification systems, Forest cover, agriculture and wasteland management. Water Resources Management.

UNIT-IV:**RS & GIS Techniques for Infrastructure Planning and Management:**

Urban utilities, cadastral mapping and transport network. GPS Navigation system for various applications.

UNIT-V:**RS & GIS Techniques for Natural Disasters Management:**

Earthquakes, Landslides, cyclones and Floods – Hazard Zonation, Risk assessment, Relief and Rehabilitation measures.

Text Books:

1. P.K. GUHA, Remote Sensing for the Beginner, EWP Ltd.
2. M.ANJIREDDY, Text Book of Remote Sensing and Geographical Information Systems, BSP Publishers.
3. Lillesand, T.M. and Kiefer, Remote Sensing and Image Interpretation, R.W. John Wiley & Sons Publishers.

B.TECH. (CE) VIII SEMESTER**EURCE 8502: Elective-I: Data Base Management Systems****Prerequisite: File processing****UNIT I:**

Introduction to DBMS – Overview, File system vs DBMS, Advantages of DBMS, Storage data, queries, Transaction Management, DBMS Structure.

UNIT II:

E-R model Entities, Attributes and Entity sets, Relation ship and Relation ship sets, Features of ER model, Conceptual database design with ER model.

UNIT III:

Relational model – integrity constraints over relations and enforcement, Querying relation data, Logical database design, views, destroying/altering tables and views. Relational algebra and calculus

UNIT IV:

SQL – Basic SQL, Query, union, interest, except, Nested Queries, Aggregated Operation, Null values, Embedded SQL, cursors, ODBC and JDBC, Triggers and Active database, designing active databases

UNIT V:

Transaction management, concurrency control & crash recovery – Transaction concept, transactions and schedules, concurrent execution of transactions, lock – based concurrency control, crash recovery. Case Study: Oracle0i (SQL, PL/SQL & Triggers)

Text Book:

- a. Database Management Systems – Raghu Ramakrishnan and Johannes Gehrke McGraw-Hill
- b. Data System Concepts – H.F.Korth and A.Silberschatz McGraw-Hill

Reference Book:

1. Fundamentals of Database System – R.El. Masri and S.B.Navathe

B.TECH. (CE) VIII SEMESTER
EURCE 8503: Elective-I: Software Engineering

UNIT I:

Introduction - Software problem – Software Engineering Problem – Software Engineering Approach

UNIT II:

Software Process – Software Process – Characteristics of Software Process – Software Development Process – Project management process – Software Configuration Management Process – Process Management Process.

UNIT III:

Software Requirements Analysis & specification – Software Requirements – Problem Analysis – Requirements Specifications – Validation – Metrics

UNIT IV

Planning a Software Project – Cost Estimation – Project Scheduling – Staffing & personnel Planning – Software Configuration Management plans – Quality Assurance Plans

UNIT V:

Function Oriented Design – Design Principles – Module Level Concepts – Design Notation and Specifications – Structured Design Methodologies – Verification – Metrics
Testing – Testing Fundamentals – Functional Testing – Structural Testing – Testing Procedure

Text Book: An Integrated Approach to Software Engineering by Pankaj Jalot – Narosa Publishers

Reference Book: Software Engineering a practitioner's approach by Pressman

B.TECH. (CE) VIII SEMESTER
EURCE 8504: Elective-I: Systems Modeling & Simulation

UNIT-I

System Models: Concept of a system, System Environment, Stochastic activities, continuous and Discrete Systems, System Modeling, Physical and Mathematical Models for Systems, Static and Dynamic Categorization of these physical and mathematical Models. Principles used in modeling.

System Simulation: MONTE-CARLO Method: Comparison of Simulation and analytical methods, Experimental nature, Types of Simulation, Numerical Computation Technique for continuous model and for Discrete model, Distributed Lag Models, Cobweb Models.

UNIT-II

Continuous System Simulation: Differential Equations, Analog Computers, Analog Models, hybrid Computers, digital – Analog Simulations, Continuous System Simulation Languages (CSSLS), CSMP – III, Hybrid Simulation, Feedback Systems, Interactive Systems, Real-Time Simulation.

System Dynamics: Exponential Growth Models, Exponential Decay Models, Logistic Curves, Generalization of Growth Models, Simple System Dynamics Diagrams, Multi-segment Models, Representation of Time Delays, WORLD Models.

UNIT-III

Probability Concepts In Simulation: Stochastic Variables, Discrete Probability functions, Continuous Probability functions, Measures of Probability functions, Numerical Evaluation of Continuous Probability functions, continuous Uniformly Distributed Random Numbers, A Uniform Random Number Generator, Generating Discrete Distributions.

Arrival Patterns And Service Times: Poisson's Arrival patterns, Exponential Distribution, Erlang Distribution, Hyper-Exponential Distribution, Normal Distribution, Queuing Disciplines, Mathematical Solutions of Queuing Problems.

UNIT-IV

Introduction To GPSS: GPSS Programs, General Description Action Times, Succession of Events, Choice of Paths, Simulation of a manufacturing Shop, Conditional Transfers, Control Statements, Functions, Simulation of a Super Market, Transfer modes, GPSS Model of a Simple Telephone system.

UNIT-V**Random Access Systems:**

Aloha, Slotted Aloha, Carrier Sense Multiple Access, Delay Calculations in CSMA/CD, Performance comparisons, Reservation Techniques.

Routing And Flow Allocation: Routing Model, Shortest Path Algorithms, Capacity Constrains, Flow control and Routing, Routing in Practice.

Text Books:

System Simulation by GEOFFREY GORDON, PHI, Second Edition.

Modeling and Analysis of computer Communications Networks. Networks Jeremiah F. Hayes, Khanna Publications.

References : Geoffrey Gordon

B.TECH. (CE) VIII SEMESTER**EURCE 8505: Elective-I: Software Project Management****Unit I:**

Conventional Software Management, Evaluation of Software Economics.

Unit II:

Improving Software Economics.

Unit III:

The old way and the new, Life-Cycle Phases.

Unit IV:

Artifacts of the Process, Model-Based Software Architectures Workflows of the Process, Checkpoints of the Process, Iterative Process Planning.

Unit V:

Project Organisations and Responsibilities, Process Automation. Project Control and Process Instrumentation, Tailoring the process.

Text Book:

1. Software Project Management, A real world guide to success by Joel Henry.
2. Software Project Management by Royce.
3. Software Project Management in practice by Pankaj Jalote
4. Quality Software Project Management by Futrell

B.TECH. (CE) VIII SEMESTER
EURCE 8506 Elective-I: Artificial Intelligence

UNIT I:

Introduction to Artificial Intelligence, Artificial Intelligence Problems, Artificial Intelligence Techniques, problems, problem space and search-defining the problem as a state space search, Production System, Problem Characteristics.

Heuristic Search Technologies Generate & Test Hill Climbing, Best First search, Problem reduction, Constraint satisfaction, Means Endo Analysis

UNIT II:

Knowledge Representation Knowledge using predicate logic representing simple facts in logic, representing instance and is relationship, computable functions and predicates resolution.

UNIT III:

Representing Knowledge Using Rules: Procedural Vs Declarative knowledge, Logic programming, Forward Vs backward Reasoning, Matching, Control Knowledge.

UNIT IV:

Symbolic Reasoning under uncertainty – Introduction to Non-monotonic Reasoning, logics for Non-monotonic Reasoning, Implementation: depth first search – Dependency – Directed Backtracking. Justification – based truth maintenance, logic based truth maintenance systems Statistical Reasoning – UNIT V: Probability and bayes theorem, Certainty factors and rule – base systems beyesian networks, Dempster – Shaffer theory.

Weak & Strong Slot and Filler Structures Sematic nets, Frames, Conceptual dependencies, Scripts
 Prescribe Books: Artificial Intelligence – Rich E & Knight K TMH 1991

Reference Book: Artificial Intelligence structures and strategies complex problem solving – George F-Lugar Pearson Education.

B.TECH. (CE) VIII SEMESTER**EURCE 8507: Elective-I: Transducers & Signal Conditioning****UNIT-I**

Static Characteristics of instruments: accuracy, precision, sensitivity, linearity, resolution, hysteresis, threshold, input impedance – loading effect generalized mathematical model of measurement systems – dynamic characteristics – operational transfer function – zero, first and second order instruments – impulse, step, ramp and frequency responses of the above instruments.

UNIT-II

Resistive transducers – Resistance potentiometer – loading effect – strain gauges – gauge factor – types of strain gauges: rosettes, semiconductor strain gauges – strain measuring circuits – resistance thermometers – materials of construction, characteristics – thermo wells – thermistors.

UNIT-III

Inductive transducers – Induction potentiometers – variable reluctance transducers – LVDT construction – applications – RVDT – Magnetostrictive transducers. Capacitive transducers – variable area type – variable air gap type – variable permittivity type – application as level transducer – capacitor microphone – frequency response.

UNIT-IV

Piezoelectric transducers – piezoelectric crystals – accelerometer – Hall effect transducers – Thermocouple transducers – IC sensors for temperature and pressure – Introduction to fiber optic and intelligent sensors.

UNIT-V

Signal conditioning – Introduction, Signal conditioning for Differential amplifiers – Instrumentation amplifier – Filters – AC and DC Bridges – A/D and D/A converters.

Text Books:

1. Mechanical measurements and instrumentation, A.K.Sawhney, Dhanpat Raj
2. Industrial instrumentation, D.Patranabis, TMH
3. Measurement systems – application and design, E.O. Doebelin, McGraw Hill

Reference:

1. Practical Instrument Transducers, F.G. Oliver, Pitman Publishing Co.
2. Transducers Engg. S. Rangathan, Allied Publishers

B.TECH. (CE) VIII SEMESTER**EURCE 8508: Elective-I: Biomedical Instrumentation****UNIT I:**

Bioelectric Signals and Electrodes: Origin of bioelectric signals – action potentials, Recording electrodes – Skin – contact impedance – Electrodes for ECG – Electrodes for EEG – Electrode for EMG – Electrical conductivity of electrode jellies and creams – microelectrodes.

UNIT II:

Physiological Transducers: Pressure transducers, Transducers for body temperature measurement – Pulse sensors – Respiration sensors.

UNIT III:

Biomedicals recorders: Electrocardiograph – Block diagram, ECG leads, effects of artifacts on ECG recordings; Phonocardiograph; Electroencephalograph – Electromyograph – Preamplifier, filters, delay circuits, stimulators.

UNIT IV:

Biomedical telemetry: Wireless telemetry – single channel telemetry systems – Temperature telemetry system – Multichannel wireless telemetry system – Multipatient telemetry – Implantable telemetry systems – Transmission of analog physiological signals over telephone lines.

UNIT V:

Patient safety: Electric shock hazards – Leakage currents – Test instruments for checking safety parameters of biomedical equipments.

Text Books:

1. R.S.Khandpur, Hand Book of Biomedical Instrumentation, TMH, New Delhi, 2001
2. Cromwell, Weibell and Pfeiffer, Biomedical instrumentation and measurements, Pearson Education 2003.

Reference:

John. G. Webster., Medical Instrumentation application and design, John Wiley & sons inc., 3rd edition, 1999.

B.TECH. (CE) VIII SEMESTER**EURCE 8509: Elective-I: Power Electronics****UNIT-I**

Power Semiconductor Switches: Power diodes, Power transistors – Thyristor family – SCR – Triac – GTO – Power MOSFET – IGBT – two transistor model – Gate characteristics – static and dynamic characteristics – Turn – ON – Turn – OFF methods – Series and Parallel operation of Thyristors – Gate triggering circuits – UJT as an SCT trigger – Thyristor ratings. Protection circuits.

UNIT-II

Phase Controlled Rectifiers: Single phase and three phase – half wave – full wave – and Bridge controlled rectifiers – Daul converters – effect of load and source inductances – Natural commutation.

UNIT-III

Choppers: Principle of operation, step up choppers – step down choppers – various types of choppers – Morgan – Jones – Oscillation chopper – commutation circuits.

UNIT-IV

Inverters: Claassificatin – series and parallel inverters – single phase and three phase inverters McMurny – McMurray Bedford inverter – Voltage control – Harmonic reduction – current source invertes.

UNIT-V

AC to AC Converters: Principle of operation of CYclo-converter – single phase to single phase Cyclo-converter – Cyclo-converter circuits – three phase output. Single phase and three phase voltage controllers using Thyristor and Traic – AC choppers.

Text Books:

- 1.Power Electronics, M.Rashid. PHI
- 2.Power Electronics, P.S. Bimbira, Khanna Publishers
3. Power Electronics, Singh M.D. and Khanchandani. TMH

Reference Books:

1. An introduction to Thyristors and their applications, M.Rama Murthy, East-West Press
2. Power Electronics, R.Ramshaw.
3. Thyristorised Power Controllers, Dubey., Wiley Eastern Ltd.

B.TECH. (CE) VIII SEMESTER**EURCE 8510: Elective-I: Project Planning and Management****UNIT-I**

Project Management Systems, Organization, Scope of construction management, Significance, concept of scientific management, qualities of manager, organization – authority policy, recruitment process and training.

UNIT- II

CPM and PERT: Introduction of Pert and CPM, Planning scheduling and controlling, Bar charts, Pert and CPM networks.

UNIT-III

Estimation, Resource Analysis, Justification and Evaluation – Introduction – Costing Proposals – Budgets – Resource analysis – Pricing Projects – Project Risk analysis – Cash Flow Consideration – Strategic Investment Decisions.

UNIT-IV

The role of Management and Leadership in Project environment – Individual Skills and Attitudes – Individual Motivation – Structural implications for Project managers – Cultural Implications – Management Style – Development of Management Thinking.

UNIT-V

Project Review – Project Completion & Handover – Long term Project audit and review – Continuous improvement – Bench Marking of Performance and Process – The role of Project Leader in the World Class Projects.

Text Book:

Harvey Maylor, Mac Millan India Ltd., Delhi

Reference Book:

Punmia: Laxmi Publications

B.TECH. (CE) VIII SEMESTER
EURCE 8511: Elective-I: Neural Networks

UNIT-I

Fundamentals of artificial Neural Networks – Biological neurons and their artificial models, Neural processing, learning and Adaptation, Neural Network Learning Rules – Hebbian, Perceptron, delta, widrow – hoff, correlation, winner – take – all, outstar learning rules.

UNIT-II

Single Layer Perceptions – Multi player Feed forward Networks – Error back propagation training algorithm, problems with back propagation, Boltzmann training, Cauchy training, Combined back propagation / Cauchy training.

UNIT-III

Hopfield networks, Recurrent and Bi-directional Associative Memories, Counter Propagation Network, Artificial Resonance Theory (ART)

UNIT-IV

Applications of neural networks – Handwritten digit and character recognition, Traveling salesman problem, Neuro controller – inverted pendulum controller,

UNIT V:

Applications of neural networks - cerebellar model articulation controller, Robot kinematics, Expert systems for Medical Diagnosis.

Text Books:

Introduction to artificial Neural System, S.M.Zurada, Jaico Publishing House (1992)

References:

1. Neural Computing – Theory and Practice, Philip D.Wesserman, Van Nostrand Rein Hold, New York (1989)
2. Neural Networks and Fuzzy Systems, Bart Kosko, Prentice Hall, NJ, (1992)

B.TECH. (CE),VIII Semester**EURCE 8512: Elective-I: Introduction to Micro Electro Mechanical Systems(MEMS)****UNIT I**

1. **Introduction:** History of MEMS, Overview of MEMS Processes, Properties of Silicon, A Sample MEMS Process. Definitions and Terminology, A sample Process, Lithography and Etching. (3 hrs.)
2. Micromachining: Subtractive Processes (Wet and Dry etching), Additive Processes (Evaporation, Sputtering, Epitaxial growth). (4 hrs)
3. Fundamental Devices and Processes: Basic mechanics and electrostatics for MEMS, parallel plate actuators, pull-in point, comb drives. Electrostatic actuators; MEMS foundries, Cronos MUMPs (multi user MEMS process). (5 hrs)

UNIT II

1. **MUMPs (Multi User MEMS Process):** JDS Uniphase MUMPs processing sequence and design rules. Design rules; applications; micro hinges and deployment actuators. 5 Hrs.
2. CMOS MEMS: CMOS foundry processes, integrated IC/MEMS, MEMS postprocessing, applications. (4 Hrs)

UNIT III

1. **Thermal Transducers:** bimorphs, “heatuators”, cilia arrays. (3 hrs.)
2. **MicroOptoElectroMechanical Systems (MOEMS):** Micro Scanners, Digital Mirror Display, Retinal Scanning Display. Grating light valve, coroner cube retroreflector, optical switches, other micro-optical devices (5 hrs) piezoresistivity; Scanning Probe Microscopy: scanning tunneling microscope (STM), atomic force microscope (AFM)(3 Hrs)

UNIT IV

1. **Wireless MEMS:** mechanical and electrical resonators, Q-factor, switches, filters (3 hrs)
2. **Power for MEMS:** thin film batteries, micro fuel cells, energy fields, MEMS Packaging and Assembly: microassembly: serial and parallel, deterministic and stochastic; microgrippers: HexSil process; packaging techniques (4 hrs)

UNIT V

1. **The future of MEMS:** Biomems – neural implants, gene chips, diagnostic chips; MEMS in space; mechanical computers; invisible and ubiquitous computing (3 hrs)

Text Books:

Fundamentals of Microfabrication: The Science of Miniaturization, Second Edition ISBN: 0849308267, CRC Press, 1997 by Marc J Madou

MEMS a Practical Guide of Design, Analysis, and Applications

Korvink, Jan, Paul, Oliver

2006, Approx. 9800 p., Oliver

ISBN: 3-540-21117-9

Mechanics of Microelectromechanical Systems

Lobontiu, Nicolae, Garcia, Ephraim

2004, XII, 405 P.295 illus., Hardcover

ISBN: 1-4020-8013-1

MEMS & Microsystems TMGH 2002 by Tai-ran Hsu

Microsensors, MEMS & Smart Devices John Wiley 2002 by JW Gardner & VK Varadan

B.TECH. (CE) VIII SEMESTER
EURCE 8513: Elective-I: Entrepreneurship

UNIT I Introduction:

Meaning, importance, benefits of Entrepreneurship-characterizes, factors of Entrepreneurship-Barriers of Entrepreneurship-Difference between Entrepreneurship and management-Evolution of the concept of entrepreneur- Difference between entrepreneur and entrepreneur. Motivational aspects of entrepreneur (McClelland theory)

UNIT II

Project identification and selection:

Meaning, classification of projects-Factors involved in project identification. Selection-significance contents, formulation of a project report – specimen of a project report-planning commission's guidelines for formulating a project-Basics of capital budgeting-Pay back period. Net present value. Internal Rate of Return.

UNIT III

Sources of finance:

Cost of capital-importance of a capital-Basic concepts, rational assumptions-cost of debt, reference, equity capital-source of finance-internal, external sources-institutional finance to entrepreneurs and institutional support to entrepreneurs.

UNIT IV

Project appraisal:

Concept project appraisal-Methods of project appraisal, Economic analysis, Financial analysis, Market analysis Technical feasibility and Managerial competence (assessment of working and fixed capital Govt. Policies, qualitative methods of market analysis, Life cycle segmentation).

UNIT V

Ownership Structures & Evaluation of Edps:

Ownership structures-sole trader, partnership (Partnership deed) types of partnership-Joint stock companies-Difference between private and a public company – Advantage and disadvantages of the ownership structures – Distinction between MDP and EDP – Training methods and Role playing (Games).

Text Books:

1. Harold Koontz & Heinz Weihrich. *Essentials of Management, McGraw Hill International.*
2. Hirich R.D. & Peters Irwin M.P., *Entrepreneurship, Mc Graw Hill*
3. Rao T.V. & Deshpande M.V., Prayag Metha, Nadakarni M.S. *Developing Entrepreneurship, Hand Book. Learning Systems.*
4. Donald Kurado & Hodgelts R.M., *Entrepreneurship A Contemporary Approach.* The Dryden Press.
5. Dr Patel V.G. *Seven Business Crisis*, Tata McGraw Hill
6. Timmons J.N. *New Venture Creation – Entrepreneurship for 21ST century*, Mc Graw Hill International.

References:

1. Patel J.B .Nold S.S. *A Manual on Business Opportunity Identification, Selections*, EDH.
2. Rao C.R. *Finance for Small Scale Industries.*
3. Pandey M.W. *Compier Guide to Successful Entrepreneurship .* Vikas Publishing

B.TECH. (CE) VIII SEMESTER**EURCE 8514: Elective-I: Public Administration**

Definition, nature and scope of public administration; the chief executive; leadership qualities of administrator, principles of organization; organization of Ministries of Home and Finance; personnel administration – bureaucracy; recruitment, promotion, conduct and discipline, employer – employee relations; administration at work-planning, policy formulation, decision making supervision, coordinator, integrity in administration; public corporations in India; financial administration in India; local administration in India.

B.TECH. (CE) VIII SEMESTER**EURCE 8515 Elective-I: Fundamentals of Communication Engineering****UNIT-I**

Amplitude Modulation: Modulation, Frequency Translation, Amplitude modulation, AM equation, Modulation index, AM generation, AM detection, Applications of linear modulation systems, Frequency division multiplexing.

UNIT-II

Angle Modulation: Angle modulation, FM, modulation index, frequency deviation, NBFM, WBFM, Phase modulation, Comparison of FM and PM, Generation of FM, Phasor representation of FM and AM, FM demodulation, Pre-emphasis and De-emphasis, Comparison of AM and Fm.

UNIT-III

Radio Transmitters & Receivers: Classification of Radio Transmitters, AM Transmitters, FM Transmitters, Classification of Radio Receivers, TRF Receiver, Superhetrodyne Receiver, AGC.

UNIT-IV

Discrete modulation techniques: Sampling sampling Theorem for low pass and bandpass signals, Time Division Multiplexing, Pulse Amplitude Modulation, Pulse time modulation – Pulse Width Modulation and Pulse Position Modulation – generation and detection.

UNIT-V

Digital Modulation Techniques: Pulse Code Modulation, Differential Pulse Code Modulation, Delta Modulation, Binary Amplitude Shift Keying Binary frequency shift Keying Binary Phase Shift Keying, Different Phase Shift Keying.

Text Books:

Electronic Communication Systems G.Kennedy, McGraw Hill Communications Systems Simon Haykings, PHI

Reference:

- 1.Applied Electronics and Radio Engg. GK. Mithal
- 2.Modern Digital and Analog Communications Systems B.P. Lathi, BSP.

B.TECH. (CE) VIII SEMESTER**EURCE 8516: Elective-I: Equipment for Construction Industry****UNIT I:**

Earth Work – Introduction, use of available equipment, suitability of job conducting, Excavation equipments, loading and lifting, transporting equipments, compacting equipments.

UNIT II

Foundation – Introduction, blasting, Drilling, Piling, Anchoring, Drainage.

UNIT III:

Concreting – Introduction, Concrete mixtures, types, Concrete batching plants, vibrators, lifts, pumps, cutting, bending, cranes.

UNIT IV:

Miscellaneous – Road Pavers, sand blasting, grouting, compressors, gate valves – control equipment for out let – and spillways, types of control gates.

UNIT V:

Advanced Construction - Methods and Equipments for Scaffolding, Slip form technique for –shuttering, tall chimneys and shafts, steel fabrication, reinforcement fabrication

Text Books & References:

1. Construction equipment and its planning and applications – Varma Mahesh, Metropolitan book Co. Pvt. Ltd., New Delhi.
2. Construction planning equipment and methods – Peurifoy R L, Led better WB, Mc Graw – Hill Education(INDIA) LTD books.
3. Construction Equipment & Management by S.C.Sharma, Khanna Publishers, New Delhi.
4. Construction Equipment & Job Planning by S.V. Deodhar, Khanna Publishers, New Delhi.

B.TECH. (CE) VIII SEMESTER**EURCE 8518: Elective-II: Data Structures with C⁺⁺****UNIT I**

Introduction to Object Oriented Programming – Data Abstraction – Data Encapsulation – Abstract Data Types – Objects – Classes – Inheritance – Polymorphism.

UNIT II

Data Representation: Introduction, linear lists, formula based representation, indirect addressing, simulating pointers, comparisons and applications. Arrays, Matrices, Special and sparse matrices.

UNIT III

Stacks: definitions, operations and applications, array and linked representation of stacks. Queues: definitions and operations. Array and linked representation of queues applications>

UNIT IV

Trees: Definitions and properties, representation of binary trees, operations. Binary tree traversal.

UNIT V:

Searching & Sorting: Merge sort, quick sort, selection sort, heap sort. Complexity analysis, Sequential search, binary search. Various types of hashing.

Text Books:

1. Data structures in C⁺⁺ by S K Chadda and AMit Chadda, Tata Mc Graw Hill.
2. Object Oriented Programming by Bala Guruswamy.

Reference:

1. Author Seymour Lipschutz (Schaum's Outline series) – publisher: McGraw-Hill
2. Author: Sartaz Sahani Publisher: McGraw – Hill
3. Author: S.K.Srivatsava, Deepli Srivatsava, Publisher- BPB Publications.

B.TECH. (CE) VIII SEMESTER
EURCE 8522: Elective-I: Basic Electronics

UNIT I:

Semiconduction Diode – Classification of semiconductors – Conductivity of semiconductors – Characteristics of PN junction diode – Halfwave Rectifier – Fullwave Rectifier – Bridge Rectifier – Ripplefactor – efficiency – Regulation – ener Diode – LED – Varactor Diode – Photo Diode.

UNIT II:

Transistors – The Bipolar junction transistor – Operation of PNP and NPN transistors – CB, CE, CC configurations – Small Signal model of transistor – Transistor biasing – fixed bias – self bias.

UNIT III:

Field effect transistor – Junction field effect transistor – JFET Characteristics – small signal model of FET – MOSFET – Depletion and Enhancement MOSFET – biasing the FET – FET as voltage variable resistor.

UNIT IV

Transistor Amplifiers – CB, CE, CC amplifiers – small signal analysis of single stage BJT amplifiers – RC coupled amplifier and its frequency response.

UNIT V

Feedback Amplifiers and Oscillators – Basic concept of feedback – effects to negative feedback – feedback topologies – Oscillators – RC phase shift oscillator – Weinbridge oscillator – Crystal oscillator (elementary treatment only)

Text books:

Integrated Electronics – Millman & Halitain, TMH

Electronic Devices at Circuits – D.R.Chelulen & B.T.Krishna – Pearson Education.

B.TECH. (CE) VIII SEMESTER**EURCE 8524: Elective-I: Computer Organization****UNIT I:**

Digital Logic Circuits and Components: Digital Computers – Logic gates – Boolean Algebra – Map Simplifications Combinational Circuits: Half-Adder, Full-Adder, decoders, Encoders, Multiplexers Sequential Circuits: Flip flops, Registers, Shift Registers, Binary Counters – Memory Unit.

UNIT II:

Data Representation: Data Types – Complements – Fixed Point Representation – Floating Point Representation – Other Binary Codes – Error detection Codes.

UNIT III:

Processor Organisation: General Register Organisation – ALU – Instruction codes – Instruction Formats – Stack Organisation – Addressing modes Control Unit: Register transfer and micro operations, Timing and Control, Control Memory, micro programming Hard Wired control

UNIT IV:

Input / Output Organisation: I/O Interface, Asynchronous data transfer, Modes of transfer, priority Interrupt, Direct memory access.

UNIT V:

Memory Organisation: Memory Hierarchy, Main memory, Auxiliary memory, Associate Memory, Cache Memory, and Virtual memory.

Text Book :

Computer System Architecture, M.Morris Mano, Prentice Hall of India Pvt. Ltd., Eastern Economy Edition, Third Edition, Sept. 2002 Micro Processor Architecture, programming & Applications with the 8085, Ramesh S Goankar Penram International Publishing (India) Pvt. Ltd., Fourth Edition, 2002

Reference Book:

Computer Architecture and Organisation, William Stallings, PHI Pvt. Ltd., Eastern Economy Edition, Sixth Edition, 2003

B.TECH. (CE) VIII SEMESTER
EURCE 8602: Elective-II: Operating Systems

UNIT I:

Introduction: Operating systems: Fundamentals Definition, Types of O.S, Batch Processing Systems, multiprogramming catch systems, time sharing systems, distributed systems, real time systems, services, system calls, system programs.

UNIT II:

Operating system: Process management , Process concept, Process scheduling, operations on processes, cooperating processes, threads, inter-process communications. CPU Scheduling - Scheduling algorithms, multiple processor and real time scheduling. Process synchronization – Critical lsection problems, semaphores.

UNIT III:

Leadlocks: Characterization, handling, Prevention, Avoidance, Detection & Recovery.

UNIT IV:

Storage management: Memory management – swapping, paging, segmentation, segmentation& paging. Virtual memory – What is virtual memory? Demand Paging, Page Relacement, frames, thrashing demand segmentation.

UNIT V:

Case study: UNIX: Fundamental Concepts in UNIX, MS-DOS: Fundamental Concepts in MS- DOS

Text Book: Applied Operating Systems Concepts – Avil Silberschatz &j Peter Galvin, Grey Gagne

Reference: Modern Operating Systems – Andrew S. Tanenbaum, PHI.

B.TECH. (CE) VIII SEMESTER
EURCE 8603: Elective-II: Web Technology

UNIT I: Introduction to Web Technology: Internet, WWW, Web Browsers, Web Servers, URL.

UNIT II: Introduction to HTML & DHTML: Syntax, Forms, Cascade Style Sheets.

UNIT III: The Basic of java Script, Perl, Primitives, Operator and Expression. Dynamic Document with Java Script.

UNIT IV: Introduction to Java Servelets Programming., Introduction to Applet Programming.

UNIT V: Structure of Web Application, Deploying Web Application.

Text Books:

1. Programming the World Wide Web by Robert W Sebesta
2. Professional Java Servelets 2.3 by John Bell Wrox Publical
3. Beginners PHP, Apache, MY Sql, Web Development, by Michael Glass Wrox.

B.TECH. (CE) VIII SEMESTER
EURCE 8604: Elective-II: Industrial Electronics

UNIT I:

Thyristors: NPN Diode: Basic structure. Two transistor version. Volt –Ampere characteristic. Holding current. Temperature dependence. Rate effect. Bilateral PNP diode switch (DIAC): Basic structure. Volt Ampere characteristics. Silicon Controlled Rectifier (SCR): Basic structure. Two transistor Representation. Volt-Ampere characteristics. ON and OFF times of gate. SCR rating. Silicon Controlled switch (SCS): Basic structure. Two transistor equivalent. Diode transistor equivalent.
Tiac: Basic structure. Volt-Ampere characteristics. Positive bias and Negative bias operations
 Injunction Transistor: Basic structure, potential divider equivalent Static emitter characteristics, gate circuit of SCR. Two SCRs connected back-to-back. Delayed firing of SCR by phase shifted AC. Wave Delayed firing of SCR by UJT.

UNIT II:

Polyphase Rectifiers: Three phase half-wave delta-wye rectifier with resistive load. Six-phase star half-wave rectifier with resistive load. Delta-to double wye half-wave rectifier with inter phase transformer and with resistive load. Three-phase delta-wye bridge rectifier with resistive load. General m-phase rectifier. DC power outputs, efficiencies and ripple factors. Transformer utility factor. Rectifier performance. Cumulation in polyphase rectifiers.

UNIT III:

Resistance Welding & Healing : Basic circuit for a.c. resistance welding. Spot welding, Projection welding, Butt welding, Seam welding and Pulsating welding arrangements. Induction Heating: Principle of induction heating, Applications, High frequency power source for induction heating. Electric Heating: Principle of dielectric heating Electrodes used in dielectric heating, Methods of coupling of electrodes to R.F. Generator. Applications

UNIT IV:

Controller Rectifiers(outlines of topics only): Single Phase Controlled Rectifiers: Half-wave controlled rectifier with resistance load. Full-wave Controlled rectifier with resistance load. – Three phase Controlled rectifiers: Half wave controlled rectifier with resistance load. Six-phase half wave.- controlled rectifier with resistance load.

UNIT V:

Electronic speed control of motors (outlines of topics only): DC Motor speed control: Methods of speed control, single phase SCR drive, Three phase SCR drives. Closed-Loop motor control system. Half-wave feedback circuit for series motor drive. Half controlled SCR bridge for Series motor drive. Chopper controlled dc drive. AC Motor speed control: Methods of speed control. The chopper-controlled rotor resistance scheme. Speed control by variation of stator voltage using SCRs. Closed-loop speed control of an induction motor by variation of stator voltage using SCRs. Variable- frequency A.C. motor drive. Voltage-fed inverter control. P.W.M. control scheme. Current-fed inverter control.

Text Books:

1. Industrial Electronics by G.K. Mithal and Ravi Mittal. Khanna publishers
2. Power Electronics by P.C. Sen, T.M.H.
3. Thyristor Engineering by M.S. Berde
4. Power Electronics by P.S. Bimbra

B.TECH. (CE) VIII SEMESTER
EURCE 8605: Elective-II: Computer Aided Design

UNIT I

Fundamentals of CAD – Introduction – The design process- Application of computers for design – Operating systems – Hardware in CAD: The design work station – I/O Devices – CAD system configuration – Creating database for manufacturing – benefits of CAD.

UNIT II

Interactive Computer Graphics – Graphic display devices – Graphics system – Graphics standards – Graphical user interface – Transformation systems – windowing – clipping – 2D and 3D transformations – Linear transformation – Display files for 3D data – Geometric Modeling – Modeling Techniques – Wire frame Modeling – Surface Modeling – 3D Solid Modeling.

UNIT III

Introduction to finite element Analysis – CAD techniques to finite element data preparation – Automatic mesh generation – presentation of results – 3-dimensional shape description and mesh generation – CAD applications of FEM.

UNIT IV

CAD applications and Exposure to CAD packages: Simple examples of computer aided drafting, design and analysis – introduction to simple machine elements – Analysis of cross sectional area, centroid & moment of inertia-Kinematics of crank-slider mechanism and other simple design applications. Introduction to CAD packages like ANSYS, NASTRON, NISA – II.

UNIT V

Introduction to Artificial Intelligence Introduction to Artificial Intelligence – Applications of AI in design and CAD.

Text Books:

1. CAD/CAM- Computer Aided Design & Manufacturing, by M.D. Groover & E.Q.Zimmer, Pearson.
2. Computer Aided Design and Manufacturing by Dr. Sadhu Singh, Khanna Publishers.

References: 1. Computer Aided Design in Mechanical Engineering, by V. Rama Murthy. 2. Elements of Computer Aided Design 7 manufacturing, by Y.C. Rao, 3. Computer Aided Kinetics for Machine Design, by D.L.Ryan. 4. computer Aided Design and Manufacturing, by C.B. Besant & C.W.K. Lui. 5. computer Aided Analysis & Design by S. Ghosal, Prentice Hall of India. 6. CAD/CAM/CIM by Radhakrishna, New age international.

B.TECH. (CE) VIII SEMESTER
EURCE 8606: Elective-II: Robotics and Automation

UNIT I

Introduction: Historical robots, robots in science fiction, future trends of robots, definitions of robots, present application status.

Robot End Effectors: Classification of end effectors, drive systems for grippers, mechanical grippers, magnetic grippers, vacuum grippers, adhesive grippers, hooks, scoops and miscellaneous devices, active and passive grippers.

UNIT II

Robot Drives Actuators and Control: Functions of drive system, general types of control, Pump classification, and introduction to pneumatic systems, electrical drives, DC motor and transfer function, stepper motor, drive mechanisms.

UNIT III

Robot Kinematics: Forward and reverse kinematics of 3 DOF arm, forward and reverse kinematics of 4 DOF arm, Homogeneous transformation, kinematics equations using homogeneous transformations.

UNIT IV

Robot Sensors: Need for sensing systems, types of sensor, robot vision, robot tactile system, proximity sensors.

UNIT V

Robot applications: Capabilities of robots, material handling, machine loading and unloading, machining and fettling robot assembly, welding, future applications. Introductory concepts.

Text Books:

- 1) Robotics Technology and Flexible Automation by S.R. Deb
- 2) James L. Fuller

B.TECH. (CE) VIII SEMESTER
EURCE 8607: Elective-II: Mechatronics

UNIT I:

Introduction: Multi disciplinary Scenarios, Origins, Evolution of Mehatronics. An overview of electronics, Introduction to Manufacturing Design.

UNIT II:

Sensors and Transducers: Intredution and background, difference between transducer and sensor tranducers types, transduction principle, photoelectric transducers, thermistors, thermo devices, thermo couple, inductive transducers capacitive transducers, pyroelectric transducers, piezoelectric transducers. Half effect transducers, Fibre optic transducers.

UNIT III:

Actuatory: Introduction, types and application areas electromechanical actuators. DC motors AC Motor.

UNIT IV:

System modeling: Introduction, system making mechanical system, electrical system, fluid system, thermal systems, translational mechanical system with sprin lamper and mass. Modeling electric motor, modeling phenumatic actuator.

UNIT V:

Digital logic: Digital logic nuer system

B.TECH. (CE) VIII SEMESTER
EURCE 8608: Elective-II: Education Research & Methodology

Research methodology: An Introduction – meaning of research – objectives of research – motivation in research – types of research – research approaches – significance of research – research methods versus methodology – research and scientific method – importance of knowing how research is done – research process criteria of good research – Defining the research problem – selecting the problem – necessity of the defining problem – technique involved in defining a problem – an illustration – Research design:- meaning of research design – need for research design
– features of a good design-important concept relating to research design – different research designs – basic principles of experimental designs.

Interpretation and report writing: Meaning of interpretation – why Interpretation? – technique of interpretation – precaution in interpretation – significance of report writing – different steps in writing report – layout of the research report – types of reports – oral presentation – mechanics of writing a research report – precautions for writing research reports.

Text Books:

- 1.C.R.Kothari, research methodology – Methods and techniques, Second edition, Wishwa Prak.
- 2.Research in Education, Best Pearson.

B.TECH. (CE) VIII SEMESTER
EURCE 8609: Elective-II: Professional Ethics

LEARNING-OBJECTIVES

- To create an awareness on Engineering Ethics and Human Values.
- To instill Moral and Social Values, exploitation of self skills & potentials and Loyalty.
- To appreciate the rights of others

Unit-I, HUMAN VALUES

Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Time management-Valuing Time – Cooperation – Commitment – Empathy – Self-Confidence – Character. Corporate Social responsibility, Social responsibility as a citizen of this great country.

Unit-II, SELF MANAGEMENT,

SELF Concept Learning Enhancement Facilitation Centre, University of Weston Sydney, Australia. A New Idea of Self Constructs, Self discipline, understanding self, Self Exploration, need and purpose. Assessment procedures and types, importance of Self assessment/appraisal systems. Gardeners multiple intelligence concept. Key to success and road map to success. Untrained/Trained Memory.

Unit-III, ENGINEERING ETHICS

Code of ethics for engineers, ASCE, ASME Codes of ethical conduct of engineers, Personal ethics, Professional ethics, Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry – moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory –uses of ethical theories– Models of Professional Roles - theories about right action - Self-interest - customs and religion professional rights - employee rights - Intellectual Property Rights (IPR), Trade marks, Patents, copy rights. Some interesting case studies.

Unit-IV, VALUE EDUCATION

Concept of Value education, its intensions, the need for value education in today's context, basic guidelines for value education, the contents of value education and the process of value education. Universal Brotherhood, spirituality, Basic human aspirations, harmony: self, family and society.

Unit-V, STRESS MANAGEMENT

Types of Stress, Positive Stress (Eustress) and rewarding experiences, Negative Stress (Distress) and its influence on human health, Methods of Stress Management for better living. Meditation, Laughter is the best medicine, Anger management. Personality development. Study & Learning skills, need to develop a positive attitudes, brain & behaviour, respect for authority, responsibility, accountability, confidentiality etc..

TEXTBOOK

- 1) S.B.Gogate,"Human Values & Professional Ethics",Vikas Publishing House Pvt., Ltd., First edition-2011
- 2) Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004

REFERENCES

1. Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall,
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available)2003.
3. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.
4. C.G.Krishnadas Nair, "Engineering Ethics" , Harishree Publishing Company, Bangalore. First Edition-2006.
5. R.K.Shukla, Anuranjan Mishra,"Human Values and Professional Ethics" Published by A.B.Publication, Delhi-2010

B. TECH. (CE) VIII SEMESTER
EURCE 8611: Elective-II: Thermodynamics

UNIT I

Introduction – Basic concepts – Thermodynamic systems, Micro & Macro systems – Homogeneous and heterogeneous systems – Concept of continuum – Pure substance – Thermodynamic equilibrium, State Property, Path, Process – Reversible and irreversible cycles – Energy as a property of the systems – energy in state and transition, work Heat, Point function, Path function – Heat transfer. Zeroth Law of thermodynamics – Concept of equality of temperatures – Joule’s experiments –

UNIT II

First law of thermodynamics – Corollaries – Isolated systems and steady flow systems – Specific heats at constant volume and pressure – First law applied to flow systems – systems undergoing a cycle and change of state – First law applied to steady flow processes – Limitations of first law of thermodynamics.

UNIT III

Perfect gas laws – Equation of state – Universal gas constant various non-flow processes – Properties of end states – Heat transfer and work transfer – change in internal energy – throttling and free expansion. Second law of thermodynamics – Kelvin Plank statement and Clausius statement and their equivalence, Perpetual motion machines of first kind and second kind – Carnot Cycle – Heat engines and heat pumps – Carnot efficiency – Clausius theorem – Clausius inequality – Concept of entropy – Principles of increase of entropy – Entropy and disorder.

UNIT IV

I.C. engines: Classification, comparison of two stroke and four stroke engines, comparison of SI and CI engines. Air cycles – Otto, Diesel, Dual, Stirling, Ericsson and Atkinson cycles and their analysis. Valve timing and port timing diagrams – Efficiencies – air standard efficiency, indicated thermal efficiency, brake thermal efficiency, mechanical efficiency, volumetric efficiency and relative efficiency. Testing and performances of I.C. engines. Basic principles of carburetion and fuel injection.

UNIT V

Refrigeration & Air Conditioning: Bell-Coleman cycle, Vapor compression cycle-effect of suction and condensing temperature of cycle performance. Properties of common refrigerants, Vapor absorption system, Electrolux refrigerator.

Reference books:

Engineering Thermodynamics, by P.K.Nag, Tata McGraw Hill Publications company.

References:

1. Thermal Engineering, by M.L.Mathur and F.S.Mehta, Jain Brothers.
2. Applied Thermodynamics-II by R. Yadav
3. I.C. Engines, by Mathur and Mehta
4. I.C. Engines by V Ganesan.
5. Thermal Engineering by P.L.Ballaney Khanna Publishers

B.TECH. (CE) VIII SEMESTER
EURCE 8612: Elective-II: Digital Signal Processing

UNIT I:

Characterization of system in Discrete Time: Impulse response and system function $H(Z)$ of digital systems, Frequency response, stability analysis, Direct Form-I, Direct form-II, Cascade and Parallel realization structures of digital filters, finite word length effects limit cycle and Dead band effect.

UNIT II:

Discrete Fourier Transform(DFT) Discrete - Time Fourier transform, computation of DFT, circular convolution and linear convolution using DFT, circular convolution and linear convolution using DFT, overlap-add method, overlap-save method, Fast Fourier Transforms(FFT), Radix-2 decimation-in-time and decimation-in frequency algorithms, Inverse FFT.

UNIT III:

Design of IIR filters: linear phase characteristics, Fourier series method, window function technique, comparison between IIR and FIR filters. Design of FIR filters, linear phase characteristics, Fourier series method, window function technique, comparison between IIR and FIR filters.

UNIT IV:

DSP architecture for signal processing, Harvard architecture, pipelining, hardware multiplier, accumulator, general purpose digital signal processors, Fixed point digital processors, floating point digital signal processors.

UNIT V:

Applications of DSP: in spectrum analysis and filtering, Application of DSP in audio applications, telecommunication and bio-medical.

Text Book: Oppenheim A.V & R.W. – digital signal processing., PHI

References: Sanjay K.Mitra-digital signal processing – A computer based approach, TMH Ifeachor E.C. & Jervis B.W., digital signal processing – A practical approach, pearson Edu.

B.TECH. (CE) VIII SEMESTER
EURCE 8613: Elective-II: Electronic Measurement & Instrumentation

UNIT I:

General Principles of Measurement and Instrumentation: Purpose, structure and classification of measurement systems, Systematic characteristics (range and span, errors and accuracy, linearity, sensitivity and hysteresis), Statistical characteristics (repeatability and reproducibility), Calibration, traceability and standards Mathematical modeling of an instrument, first order type system, second order type system and their response for standard signal inputs.

UNIT II:

Sensing Devices: Introduction of transducers and sensors- classification of transducers – Resistive, capacitive and inductive transducers – thermocouples and thermistors – Strain gauges and gauge factor – LVDT – ymchros – piezoelectric effect, prizoelectric transducer-optical sensors

UNIT III:

Measurement of Non-electrical quantities – Load cells – measurement of pressure using electrical transducers as secondary transducers – vaccum gauges – torque measurement – angular velocity using tachometers and digital methods. – LVDT type accelerometer – Flow measurement using electromagnetic – hot wire anemometer and ultrasonic types – capacitance method of liquid level measurement.

UNIT IV:

Electronic Instruments (Elementary Treatment only) – Digital voltmeters – digital frequency meter – digital phase angle meter – analog and digital type – Vector impedance meter – Q meter

UNIT V:

Analyzers (Elementary Treatment only) – Wave analyzers – spectrum analyzers – Distortion analyzer

Text Books:

1. Transducers and Instrumentation by DVS Murthy, Prentice Hall of India
2. Electrical and Electronics MEASUREMENTS AND Instrumentation by A.K.Shawney
3. Modern Electronics Instrumentation and Measurement Techniques W.D.Cooper

References:

- 1.Measurement Systems, Applications and Design – by D.O.Doeblin
- Electronics Instrumentation – H.S.Kalsi

B.TECH. (CE) VIII SEMESTER
EURCE 8614: Elective-II: Very Large Scale Integrated System Design (VLSI)

UNIT I:

Review of microelectronics and introduction to MOS technology: Introduction MOS and related VLSI technology, NMOS, CMOS, BICMOS, GaAs Technologies, Thermal aspects of processing, production of E beam masks.

UNIT II:

MOS and BICMOS circuit design process: MOS layers, stick diagrams, design rules and layout, 2i.meter, 1.2i. meter CMOS rules. Layout diagrams, Symbolic diagrams.

UNIT III:

Basic circuit concepts: Sheet resistance, Area capacitance of layers, delay unit, wiring capacitances, choice of layers. Scaling of MOS circuits: Scaling models, Scaling function for device parameters, Limitation of Scalling.

UNIT IV:

Sub system design process: Architectural issues, switch logic, examples of structural design(Combinational logic), design of ALU sub system, commonly used storage elements, aspects of design rules.

UNIT V:

Test and Testability: Design for testability built in self test (BIST), testing sequential logic, practical design for test guide lines, scan design techniques, etc,

Text Books:

Basic VLSI design bby Douglas A, Pucknell, Kamran Eshraghian, Prantice-Hall, 1996 3rd edition.

Reference:

Mead, C A and Conway, L.A, Introduction to VLSI systems, Wesley-Wesley

B.TECH. (CE) VIII SEMESTER
EURCE 8616: Elective-II: Engineering Materials

UNIT I

Metallic Materials: Ferrous Materials: Iron Materials, Carbon Materials, Phase Distribution. Heat Treatment of steel. Wrought iron. Properties and Classification of Plain Carbon & alloy steels like Maroim Steel, Hard Field Steel. Stainless Steel. Tool Steel. Cast ron and its applications.

UNIT II:

Composite Materials: Science: Polymer matrix Composites Cement Matrix Composites, Carbon Matrix Composites, Metal matrix Composites. Ceramic matrix Composites. Applications: Structural applications, Electronic application. Thermal applications. Electro chemical applications. Environmental applications. Biomedical applications.

UNIT III:

Polymeric Materials: Types of polymerization, properties of Macro Molecules, Fabrication of Plastics, preparation of epoxy reins and polycarbonates. Carbon fibre reinforced Plastics. Molecular Computers, Rubbers and Elastomers.

UNIT IV

Ceramic & Refractory Materials: Ceramics: Classification of white wears. Manufacturing of white wears. Earthen wear Stine wear. Engineering applications of refractory materials.

UNIT V:

Electronic Materials: Introduction: Metallic glasses – surface ecostic view materials – Biometallic ceramics – Cermets – Electrets – Nano Phase Materials. Intermeterial Compounds. SMART Materials, Conducting Polymers, Electronic detectors and Emitters. Logic Structure Materialization Technology.

Text Books:

1. Composite materials Science & Applications. D.L. Chung, Deborah, Springer Publication.
2. Introduction to Physical materials S.H.Aveneer. Tata Mac Grawhill
3. Text Book of Engineering Chemistry, Sashi Chawla, Dhopatrai & Sons
4. Engineering Chemistry, S.S.Dhara

B.TECH. (CE) VIII SEMESTER
EURCE 8617: Elective-II: Computer Networks

UNIT I:

Introduction – Uses of Computer Networks – Network Hardware – Network Software – Reference Models – Example Networks

UNIT II:

The Physical Layer – The Theoretical basis for Data Communication – Guided Transmission Media
– The Public switched Telephone Network – Community Antenna Television – The local loop: Modems, ADSL and Wireless – Cable Modems

UNIT III:

Data link layer – Data link layer design issues – Services provided to the Network Layer – Framing
– Error Control – Flow Control – Error detection and correction – Error correction codes – Error – detection codes
– Elementary Data link protocols – An unrestricted simplex protocol – A simplex stop and wait protocol – Sliding window protocols – A one-bit sliding window protocol – A protocol using Go Back N – A protocol using selective repeat – Example Data link protocols – HDCL – High level Data Link Control.

UNIT IV:

The medium Access Control Sub-layer – The Channel Allocation Problem – Static Channel Allocation in LAN's and MAN's – Dynamic Channel allocation in LANs and MANs – Multiple Access Protocols – ALOHA – Carrier sense Multiple Access Protocol – Collision Free Protocols – Wireless LAN Protocols – Ethernet – Ethernet Cabling – Manchester Encoding – The Ethernet MAC Sub-layer Protocol – IEEE 802.2: Logical Line Control.

UNIT V:

Network Layer – Store and forward Packet switching – Store and forward Packet switching – service provided to the Transport by
- Implementation of connectionless service – Implementation of connection oriented service – Comparison of virtual circuit and datagram subnets – Routing Algorithms – Optimality principle – Shorter Path routing – Flooding – Link State Routing – Hierarchical routing – Congestion Control Algorithms – General Principles of Congestion Control – Congestion Prevention Policies – Congestion control in virtual – Circuit subnets – Congestion control in datagram subnets – Load shedding – Internet Working – How networks differ? How networks can be connected?

B.TECH. (CE) VIII SEMESTER
EURCE 8618: Elective-II: Micro Processor & Micro Controllers

1. Intel 8085: Architecture – memory addressing – addressing modes – instruction set – assembly language programming – interrupts – pin configuration – timing diagrams.
2. Peripheral Devices: Programmable peripheral interface(8255) – programmable Communication interface(8251) – Programmable timer (8253) – DMA controller (8259) – programmable interrupt controller (8257)
3. 8051 Micro Controller: Architecture – Addressing modes – Basic Assembly Language programming Concepts – Moving data – Logical Operations – Arithmetic Operations – Jump and call instructions.
4. 8051 serial communication: Basics of serial communication, 8051 serial communication.

Text Books:

1. “Microprocessor Architecture, Programming and Applications”, Goankar R.S.; Penram International Publishing (India) P.Ltd
2. “The Intel Microprocessors – Architecture, Programming & Interfacing, Brey B.B.; PHI
3. “8051Micro-Controller and Embedded Systems’, Mohammed Ali Mazidi, Janice Gillispi Mazidi, Pearson Education India.
4. “Programming and Customizing the 8051 Micro-Controller”, Myke Prediko. TMH

B.TECH. (CE) VIII SEMESTER
EURCE 8619: Elective-II: Managerial & Engineering Economics

UNIT I:

Fundamentals of Economics- Scarcity and Efficiency Market, Command and Mixed Economics, Basic Elements of Supply and Demand – Law of Demand – Elasticity of Demand.

UNIT II:

Business Organizations – Individual Proprietorship – Partnership – The Corporation. Statement of Profit and Loss – The Balance Sheet – Break – Even Analysis – Cost Concepts – Elements of Costs.

UNIT III:

Principles and Functions of Management – Evolution of Management Thought – Decision Making Process. Organization Theory and Process – Leadership – Motivation – Communication – Conflict Management in Organization.

UNIT IV:

Plant Location – Plant Layout – Production Planning and Control – Product Design and Development – channel of Distribution. Materials Management – Inventory Control.

UNIT V:

Industrial Disputes and their settlement – Provision of Factories Act and Industrial Disputes Act – Recent Trends in Contemporary Business Environment.

References:

- 1.Economics – Paul A.Samuelson and William D.Nordhaus.
- 2.Engineering Economics – Vol.1- Tara Chand
- 3.Financial Management – S.N.Maheswari
- 4.Essentials of Management – Koontz and O’ Donnel
- 5.Production and Operation management – B.S.Goel
- 6.Modern Production / Operation management – Elwood S.Buffa, Rakesh K.Sarin
- 7.Industrial Law – S.P.Jain
- 8.Industrial Law – R.P.Maheswari and S.N.Maheswari
- 9.Labour and Industrial Laws – Singh, Agarwal and Goel

