Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 1ST YEAR (SEMESTER – I) (Common for all branches)
Credit Based Scheme w.e.f. 2012-13

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	HUM 101B	COMMUNICATIVE ENGLISH	3	1		25	75	-	100	4	3
2	MATH 101B	MATHEMATICS-I	3	1		25	75	-	100	4	3
3	PHY 101B	ENGINEERING PHYSICS-I	3	1		25	75	-	100	4	3
4	ME101B	MANUFACTURING PROCESSES **(Gr-A)**	3	1		25	75	-	100	4	3
	CH101 B	**OR** ENGINEERING CHEMISTRY **(Gr-B)**	3	1		25	75				
5	EE101B	PRINCIPLES OF ELECTRICAL ENGINEERING **(Gr-A)**	3	1		25	75	-	100	4	3
	CSE101B	**OR** INTRODUCTION TO COMPUTERS & PROGRAMMING **(Gr-B)**	3	1		25	75	-	100		
6	ME103B	ENGINEERING GRAPHICS & DRAWING **(Gr-A)**	1	-	4	40	-	60	100	3	3
	ME105B	OR ELEMENTS OF MECHANICAL ENGINEERING **(Gr-B)**	3	1	-	25	75		100	4	
7	PHY103B	PHYSICS LAB-I	-	-	2	20		30	50	1	3
8	ME 107B	WORKSHOP PRACTICE **(Gr-A)**	-	-	4	40		60	100	2	3
	CH103B	OR CHEMISTRY LAB **(Gr-B)**	-	-	2	20		30	50	1	
9	EE103B	PRINCIPLES OF ELECTRICAL ENGINEERING LAB **(Gr-A)**	-	-	2	20		30	50	1	3
	CSE103B	**OR** COMPUTER PROGRAMMING LAB **(Gr-B)**	-	-	2	20		30	50	1	
10	ME109B	ELEMENTS OF MECHANICAL ENGINEERING LAB **(Gr-B)**	-	-	2	20		30	50	1	3
Total		**Gr-A**	**16**	**5**	**12**	**245**	**375**	**180**	**800**	**27**	
		Gr-B	**18**	**6**	**8**	**230**	**450**	**120**	**800**	**28**	

Note:

1. Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of sports is given in General Proficiency & Ethics Syllabus.
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.
3. Electronics gadgets including Cellular phones are not allowed in the examination.
4. All the branches are to be divided into group 'A' and 'B' as per the suitability of the institute/college, so that there is an equitable distribution of teaching load in odd and even semesters.

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 1ST YEAR (SEMESTER – II) (Common for all branches)
Credit Based Scheme w.e.f. 2012-13

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1.	MATH102B	MATHEMATICS-II	3	1		25	75	-	100	4	3
2	PHY102B	ENGINEERING PHYSICS-II	3	1		25	75	-	100	4	3
3	ME101 B	MANUFACTURING PROCESSES (**Gr-B**)	3	1		25	75				
		OR						-	100	4	3
	CH101 B	ENGINEERING CHEMISTRY (**Gr-A**)	3	1		25	75				
4	EE101B	PRINCIPLES OF ELECTRICAL ENGINEERING (**Gr-B**)	3	1		25	75	-			
		OR							100	4	3
	CSE101B	INTRODUCTION TO COMPUTERS & PROGRAMMING (**Gr-A**)	3	1		25	75	-			
5	ECE102B	BASICS OF ELECTRONICS ENGINEERING **OR**									
	BT102B	BASICS OF BIO TECHNOLOGY **OR**									
	HUM102 B	ORAL COMMUNICATION SKILLS **OR**	3	1		25	75	-	100	4	3
	CE102 B	BASICS OF CIVIL ENGINEERING									
6	ME103B	ENGINEERING GRAPHICS & DRAWING (**Gr-B**)	1	-	4	40	-	60	100	3	
		OR									3
	ME105B	ELEMENTS OF MECHANICAL ENGINEERING (**Gr-A**)	3	1	-	25	75	-	100	4	
7	PHY104B	PHYSICS LAB-II	-	-	2	20		30	50	1	3
8	ME 107B	WORKSHOP PRACTICE (**Gr-B**)	-	-	4	40		60	100	2	
		OR									3
	CH103B	CHEMISTRY LAB (**Gr-A**)	-	-	2	20		30	50	1	
9	EE103B	PRINCIPLES OF ELECTRICAL ENGINEERING LAB (**Gr-B**)	-	-	2	20		30	50		
		OR								1	3
	CSE103B	COMPUTER PROGRAMMING LAB (**Gr-A**)	-	-	2	20		30	50		
10	ME109B	ELEMENTS OF MECHANICAL ENGINEERING LAB (**Gr-A**)	-	-	2	20		30	50	1	3
11	GP 102B	GENERAL PROFICIENCY & ETHICS	1			-		50	50	2	
Total		**Gr-B**	**17**	**5**	**12**	**245**	**375**	**230**	**850**	**29**	
		Gr-A	**19**	**6**	**8**	**230**	**450**	**170**	**850**	**30**	

Note:

1. Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Sports is given in General Proficiency& Ethics Syllabus.
2. Each student has to undergo a workshop at least 4 weeks (80-100 hours) at the end of II semester during summer vacations. **Out of the four weeks, two weeks would be dedicated to general skills and two weeks training for specialized discipline/ department** The evaluation of this training shall be carried out in the III semester.
3. The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.
4. Electronics gadgets including Cellular phones are not allowed in the examination.
5. All the branches are to be divided into group 'A' and 'B' as per the suitability of the institute/college, so that there is an equitable distribution of teaching load in odd and even semesters.
6. The elective course HUM102 B ORAL COMMUNICATION SKILLS is deleted with effect from the session 2013 -14.

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 2nd YEAR (SEMESTER – III: CIVIL ENGINEERING)
Credit Based Scheme w.e.f. 2013-14

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P/D		Theory	Practical			
1	GES 201 B OR MGT 201B	ENVIRONMENTAL STUDIES **FOR GROUP 'B'** OR ENGINEERING ECCONOMICS COMMON **FOR ALL BRANCHES EXCEPT BT & BME GROUP 'A'**	3 4	- -	-	- 25	75* 75	- -	75* 100	- 4	3 3
2	CE 201B	STRENGTH OF MATERIALS	3	1	-	25	75	-	100	4	3
3	CE 203B	SURVEYING	3	1	-	25	75	-	100	4	3
4	CE 205B	FLUID MECHANICS	3	1	-	25	75	-	100	4	3
5	CE 207B	BUILDING CONSTRUCTION AND DRAWING	3	-	3	25	75	-	100	4.5	3
6	CE 209B	BUILDING MATERIALS	3	1	-	25	75	-	100	4	3
7	CE 211B	STRENGTH OF MATERIALS LAB	-	-	2	20		30	50	1	3
8	CE 213B	SURVEYING LAB	-	-	2	20		30	50	1	3
9	CE 215B	FLUID MECHANICS LAB	-	-	2	20		30	50	1	3
10	GES 203B	ENVIRONMENTAL STUDIES COMMON FOR ALL BRANCHES FIELD WORK GROUP ¢Bô	-	-	-	-	-	25	25*	-	
11	ME217B	WORSHOP COMMON FOR ALL BRANCHES EXCEPT BT & AE	-	-	2*	50	-	-	50	2	
		Total Group B	**18**	**4**	**11**	**235**	**375**	**115**	**725**	**25.5**	
		Group A	**19**	**4**	**11**	**260**	**450**	**115**	**825**	**29.5**	

Note:

1 **Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Sports is given in General Proficiency Syllabus.**
2 **The Environmental studies (GES-201 B) & Environment Studies Field work (GES-203B) are compulsory & qualifying courses.**
3 **The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.**
4 **Electronics gadgets including Cellular phones are not allowed in the examination**
5. * Assessment of workshop training undergone in summer vacations at the end of second semester will be based on seminar /viva voce/report and certificate of workshop training by the students from in house workshop

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 2nd YEAR (SEMESTER – IV: CIVIL ENGINEERING)
Credit Based Scheme w.e.f. 2013-14

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	MGT 201 B OR GES 201B	ENGINEERING ECONOMICS **COMMON FOR ALL BRANCHES EXCEPT BT & BME GROUP ôBô** OR ENVIRONMENTAL STUDIES GROUPôAô	4 3	- -	 -	25 -	75 75*	-	100 75*	4	3
2	CE 202B	STRUCTURAL ANALYSIS - ш	3	2		25	75	-	100	5	3
3	CE 204B	OPEN CHANNEL FLOW	3	1	-	25	75	-	100	4	3
4	CE 206B	GEOMATICS ENGINEERING	3	1	-	25	75	-	100	4	3
5	CE 208B	ENGINEERING GEOLOGY	3	1	-	25	75	-	100	4	3
6	CE 210B	CONCRETE TECHNOLOGY	3	-	-	25	75	-	100	3	3
7	CE 212B	STRUCTURAL ANALYSIS ï шLAB	-	-	2	20	-	30	50	1	3
8	CE 214B	OPEN CHANNEL FLOW LAB	-	-	2	20	-	30	50	1	3
9	CE 216B	GEOMATICS ENGINEERING LAB	-	-	2	20	-	30	50	1	3
10	CE 218B	ENGINEERING GEOLOGY LAB	-	-	2	20	-	30	50	1	3
11	CE 220B	CONCRETE TECHNOLOGY LAB	-	-	2	20	-	30	50	1	3
12	GPCE 202B	GENERAL PROFICIENCY & ETHICS	1	-	-	75	-	-	75	2	3
Total		**Group B**	**20**	**5**	**10**	**325**	**450**	**150**	**925**	**31**	
		Group A	**19**	**5**	**10**	**300**	**375**	**150**	**825**	**31**	

Note:

1 **The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.**

2 **Electronics gadgets including Cellular phones are not allowed in the examination.**

3. Each student has to undergo Survey Camp of 2 weeks to be conducted by the Department during summer vacation and its evaluation shall be carried out in the V Semester.

4. The Environmental studies (GES-201 B) is compulsory & qualifying courses.

5. All the branches are to be divided into group 'A' and 'B' as per the suitability of the institute/college, so that there is an equitable distribution of teaching load in odd and even semesters.

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 3rd YEAR (SEMESTER – V: CIVIL ENGINEERING)
Credit Based Scheme w.e.f. 2014-15

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	CE301B	STRUCTURAL ANALYSIS - ɯ	3	2		25	75	-	100	5	3
2	CE303B	HYDROLOGY	3	1		25	75	-	100	4	3
3	CE305B	REINFORCED CONCRETE DESIGN ï I	3	2		25	75	-	100	5	3
4	CE307B	ENVIRONMENTAL ENGINEERING - I	3	1		25	75	-	100	4	3
5	CE309B	TRANSPORTATION ENGINEERING - ɯ	3	1		25	75	-	100	4	3
6	CE311B	GEO-MECHANICS	3	1		25	75	-	100	4	3
7	CE313B	REINFORCED CONCRETE DESIGN ï I LAB	-	-	2	20	-	30	50	1	3
8	CE315B	ENVIRONMENTAL ENGINEERING ï I LAB	-	-	2	20	-	30	50	1	3
9	CE317B	TRANSPORTATION ENGINEERING ï ɯLAB	-	-	2	20	-	30	50	1	3
10	CE319B	GEO-MECHANICS LAB	-	-	2	20	-	30	50	1	3
11	CE321B	SURVEY CAMP	-	-	2*	20	-	30	50	2	3
Total			**18**	**8**	**10**	**250**	**450**	**150**	**850**	**32**	

Note:

1. **Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of sports is given in General Proficiency Syllabus.**
2. **The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator are prohibited in the examination.**
3. **Electronics gadgets including Cellular phones are not allowed in the examination**
4. *** Assessment of survey camp held after fourth semester.**

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 3rd YEAR (SEMESTER – VI: CIVIL ENGINEERING)
Credit Based Scheme w.e.f. 2014-15

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	CE 302B	REINFORCED CONCRETE DESIGN ï II	3	2		25	75	-	100	5	4
2	CE 304B	DESIGN OF STEEL STRUCTURES ï ш	3	2		25	75	-	100	5	3
3	CE 306B	FOUNDATION ENGINEERING	3	1		25	75	-	100	4	3
4	CE 308B	STRUCTURAL ANALYSIS - III	3	2		25	75	-	100	5	3
5	CE 310B	TRANSPORTATION ENGINEERING - ш	3	1		25	75	-	100	4	3
6	CE 312B	ENVIRONMENTAL ENGINEERING - II	3	1		25	75	-	100	4	3
7	CE 314B	REINFORCED CONCRETE DESIGN ï II LAB	-	-	2	20		30	50	1	3
8	CE 316B	FOUNDATION ENGINEERING LAB	-	-	2	20		30	50	1	3
9	CE 318B	ENVIRONMENTAL ENGINEERING ï II LAB	-	-	2	20		30	50	1	3
10	HUM 302B	REPORT WRITING SKILLS	1	-	-	25	50	-	75	2	3
11.	HUM 304B	ORAL PRESENTATION SKILLS	-	-	2	20	-	30	50	1	2
12	GPCE 302B	GENERAL PROFICIENCY & ETHICS	1	-	-	75	-	-	75	2	-
Total			**19**	**9**	**8**	**330**	**500**	**120**	**950**	**35**	

Note:

1. **The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.**
2. **Electronics gadgets including Cellular phones are not allowed in the examination.**
3. **Each students has to undergo Professional Training of at least 4 weeks from the industry, institute, research lab, training center etc during summer vacation and its evaluation shall be carries out in the VII semester.**

Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. Final YEAR (SEMESTER – VII: CIVIL ENGINEERING)
Credit Based Scheme w.e.f. 2015-16

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	CE 401B	PROJECT PLANNING AND MANAGEMENT	3	1		25	75	-	100	4	3
2	CE 403 B	DESIGN OF STEEL STRUCTURES - ш	3	2		25	75	-	100	5	4
3	CE 405 B	IRRIGATION ENGINEERING I	3	0		25	75	-	100	3	3
4	CE407B	ESTIMATING AND COSTING	3	1		25	75	-	100	4	3
5		DEPARTMENTAL ELECTIVE ï I*	3	1		25	75	-	100	4	3
6		OPEN ELECTIVE#	4	0		25	75	-	100	4	3
7	CE 409 B	IRRIGATION ENGINEERING I LAB	-	-	2	20		30	50	1	3
8	CE 411 B	PROJECT	-	-	4	100	-	-	100	4	-
9	CE 413 B	COLLOQUIUM	-	-	2	50			50	2	-
10	CE 415 B	PROFESSIONAL TRAINING	-	-	2	50	-	-	50	2	-
Total			**20**	**5**	**10**	**370**	**450**	**30**	**850**	**33**	

*** List of Departmental Elective – I**

1	CE 453B	PRE-STRESSED CONCRETES	5	CE 461B	ROCK MECHANICS
2	CE 455B	CONSTRUCTION METHODS AND EQUIPMENTS	6	CE 463B	INDUSTRIAL WASTE MANAGEMENT
3	CE 457B	SOIL EXPLORATION AND TESTING	7	CE 465B	GROUND WATER ENGINEERING
4	CE 459B	ADVANCED DESIGN OF CONCRETE STRUCTURES	8	CE 467B	SYSTEM DEISGN TECHNIQUES
			9	CE469B	TRAFFIC ENGINEERING

*** List of Open Electives**

1	MEI 623B	ENTREPRENEURSHIP	6	BT401B	BIO-INFORMATICS
2	BME451B	MEDICAL INSTRUMENTATIONS	7	AE417B	MODERN VEHICLE TECHNOLOGY
3	ECE305B	CONSUMER ELECTRONICS	8	CE451B	POLLUTION & CONTROL
4	EE451B	ENERGY AUDIT	9	CSE411B	MANAGEMENT INFORMATION SYSTEM
5	EEE457B	ENERGY RESOURCES & TECHNOLOGY	10	CSE 451B	CYBER SECURITY

Note:

1 Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Sports given in General Proficiency Syllabus.

2 Students will be permitted to opt for any one elective run by the other department. However, the department shall offer those elective for which they have expertise. The choice of the students for any elective shall not be binding for the department to offer, if the department does not have expertise. The minimum strength of the students should be 20 to run an elective.

3 Assessment of Professional Training, undergone at the end of VI semester, will be based on seminar, viva-voce, report and certificate of Professional Training obtained by the student from the industry, , institute, research lab, training center etc

4 The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.

5 Electronics gadgets including Cellular phones are not allowed in the examination

SCHEME OF STUDIES & EXAMINATIONS
B.Tech. Final YEAR (SEMESTER – VIII: CIVIL ENGINEERING)
Credit Based Scheme w.e.f. 2015-16

S. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
1	CE 402B	ELEMENTS OF EARTH QUAKE ENGINEERING	3	1		25	75	-	100	4	3
2	CE 404B	IRRIGATION ENGINEERING II	3	2		25	75	-	100	5	3
3	MGT 402B	HUMAN VALUES, ETHICS AND IPR	4	-		25	75	-	100	4	3
4		DEPARTMENTAL ELECTIVE ï uû	3	1		25	75	-	100	4	3
5		DEPARTMENTAL ELECTIVE ï luû#	3	1		25	75	-	100	4	3
6	CE 406B	IRRIGATION ENGINEERING II LAB	-	-	3	20	-	30	50	1.5	3
6	CE 408B	PROJECT	-	-	8	75	-	125	200	8	3
7	GFCE 402B	GENERAL FITNESS FOR THE PROFESSION	-	-	-		-	100	100	4	3
Total			**16**	**5**	**11**	**220**	**375**	**255**	**850**	**34.5**	

Note:

1. **The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.**
2. **Electronics gadgets including Cellular phones are not allowed in the examination**

*** List of Departmental Elective – II**

1	CE ï 452B	DOCKS AND HARBOUR ENGINEERING
2	CE ï 454B	ROAD SAFETY AND ENVIRONMENT
3	CE ï 456B	CONSTRUCTION MANAGEMENT
4.	CE ï 458B	SOIL DYNAMICS
5	CE ï 460B	GROUND IMPROVEMENT
6	CE ï 462B	ENERGY EFFICIENT BUILDINGS
7	CE ï 464B	WATER POWER ENGINEERING
8	CE ï 466B	ENVIRONMENTAL IMPACT ASSESSMENTS

 # List of Departmental Elective – III

1	CE ï 482B	FINITE ELEMENT METHODS
2	CE ï 484B	RURAL WATER SUPPLY AND SANITATION
3	CE ï 486B	DISASTER MANAGEMENT
4	CE ï 488B	WASTE MANAGEMENT
5	CE ï 490B	MASS RAPID TRANSPORT SYSTEMS
6	CE ï 492B	WATER RESOURCES PLANNING AND MANAGEMENT
7	CE ï 494B	DESIGN OF MASONRY
8	CE-496B	BRIDGE ENGINEERING

1 **Note: Students will be permitted to opt for any one elective from each group run by the Department. However, the Department shall offer those electives for which they have expertise. The choice of the students for any elective shall not be binding for the Department to offer, if the Department does not have expertise. The minimum strength of the students should be 20 to run an elective.**

HUM 101B COMMUNICATIVE ENGLISH							
B. Tech. Semester - I (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**

3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

Objective

The course aims at developing the desired language (English) skills of students of engineering and technology so that they become proficient in communication to excel in their professional lives. The course has been designed so as to enhance their linguistic and communicative competence.

Course Content

UNIT I

Communicative Grammar:

A) Spotting the errors pertaining to tenses, conditional sentences, Concord – grammatical concord, notional concord and the principle of proximity b/w subject and verb

B) Voice, Reported Speech.

UNIT II

Langauge through Literature:

Linguistic Reading of the following texts

A) 'Kabuliwallah' by Rabindranath Tagore*

B) 'Am I Blue?' by Alice Walker*

C) 'If You are Wrong, Admit It' by Dale Carnegie*

D) 'Engine Trouble' by R.K. Narayan*

The prescribed texts will be used as case studies for various components of the syllabus. * the Source is given in the list of Texts Books given below.

UNIT III

Group Communication:

A) Communication: concept, Process and Barriers
B) Communicating using Standard Pronunciation with the help of IPA
C) Formal Speaking with peers (e.g. discussion, talks on current issues in a class)
B) Writing official letters on issues concerning students and social life

C) Writing small reports on scientific issues, IT issues, University fests/programmes

C) E-mail writing and writing for web

UNIT IV

Communicative Creativity:

A) Comprehension: Extracting, interpreting, summarizing, reviewing and analyzing the prescribed texts.

B) Composition: Developing themes and situations through role play activities or dialogue writing.

Contd.

TEXT BOOKS

1. Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech & Jan Svartvik. *A Comprehensive Grammar of the English Language*. London: Longman, 1989
2. Communicative English for Engineers and Professionals by Nitin Bhatnagar & Mamta Bhatnagar New Delhi: Pearson / Longman
3. Crystal, David. Rediscover Grammar. London: Longman/Pearson, 1988.
4. *Tagore, Rabinder. "Kabuliwallah" , *Famous Indian Stories*. Ed. M.G.Narsimha Murthy .Mumbai: Orient Blackswan, 2009. (Web source: www.angelfire.com)
5. * Walker, Alice. "Am I Blue" , *An Anthology of Short Stories* . Ed. Usha Bande .New Delhi: OUP , 2004. (Web source- www.old.li.scru.edu)
6. *Narayanan .K.R. "Engine Trouble", *Contemporary English Prose* .Ed. K.P.K.Menon. New York: OUP,1976. (Web Source- www.scribd.com)
7. *Carnegie, Dale. "If you are wrong admit it", *An Anthology of Modern Prose*. Ed Manmohan K.Bhatnagar.Delhi :Macmillan India Ltd,2006.

SUGGESTED READING

1. Pink, M.A. and S.E. Thomas. *English Grammar, Composition and Correspondence.* Delhi: S. Chand and Sons
2. McRae, John and Roy Boardman. *Reading Between the Lines.* Delh: Foundation Books (Cambridge University Press)
3. Sharma, Sangeeta and Binod Mishra. *Communication Skills for Engineers and scientists*. Delhi: PHI, 2009
4. Fitikides, T.J. *Common Mistakes in English*. Essex: Pearson Education, 1936, 6th edition 2000.

SCHEME OF END SEMESTER EXAMINATION (MAJOR TEST)

Theory

1. The duration of the exam will be 3 hours.
2. The Question Paper for this theory course shall have seven questions in all covering all the units of the syllabus..
3. The student is required to attempt all the seven questions.
4. Questions No. 1 based on Unit I is of **15** marks. It may be in the form of 'Do as directed: trace the error, choose the correct alternative, supply the correct alternative/s, change the voice, convert the speech from direct to indirect or vice-versa'.
5. Question no 2 and 3 based on prescribed texts in Unit II. Question no 2 of **10 m**arks is to evaluate the comprehension of the text through short answer questions or a long answer question to assess the students' reading comprehension, interpretative and analytical abilities. Question no 3 of **15** marks will judge the linguistic aspect of the text such as using a particular word in its various syntactic forms like noun, adjective, verb etc.; matching the lists of words and their explanation; providing opposite/similar meanings and other grammar components prescribed in Unit I of the syllabus.

6. Question no 4 based on Unit III is of **10** marks. It may be in the form of transcription of words given, describe an event, classmate, discuss an issue etc.

7. Question no 5 based on Unit III is of **10** marks. It requires the student to frame either a small report on a topic given or write the given official letter, or e-mail a message.

8. Question no 6 based on unit IV is of **10** marks. It evaluates the Comprehension and Interpretation of the texts prescribed in Unit II. The vocabulary, general understanding and interpretation of the content may be evaluated in the form of question answer exercise, culling out important points, suggesting a suitable topic/title, summarising and interpreting.

9. Question No. 7 based on unit IV is of **5** marks. It requires the student to develop a hypothetical situation in a dialogue form, or to develop an outline, key expression, for role play activity.

MATH 101B MATHEMATICS - I							
B. Tech. Semester - I (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

INFINITE SERIES : Convergence and divergence, Comparison, D' Alembert's ratio, Integral,

Raabe's, Logrithmic and Cauchy root tests, Alternating series, Absolute and conditional convergence.

Applications of Differentiation : Taylor's and Maclaurin's series, Asymptotes, Curvature Asymptotes.

UNIT-II

PARTIAL DIFFERENTIATION & ITS APPLICATIONS : Functions of two or more variables; partial derivatives, Total differential and differentiability, Derivatives of composite and implicit functions, Jacobians, Higher order partial derivatives.

Homogeneous functions, Euler's theorem, Taylor's series for functions of two variables (without proof), maxima-minima of function of two variables, Lagrange's method of undetermined multipliers, Differentiation under integral sign.

UNIT-III

APPLICATIONS OF SINGLE & MULTIPLE INTEGRATION : Applications of single integration to find volume of solids and surface area of solids of revolution. Double integral, change of order of integration, Double integral in polar coordinates, Applications of double integral to find area enclosed by plane curves and volume of solids of revolution.

Triple integral, volume of solids, change of variables, Beta and gamma functions and relationship between them.

UNIT-IV

VECTOR CALCULUS : Differentiation of vectors, scalar and vector point functions Gradient of a scalar field and directional derivative, divergence and curl of a vector field and their physical interpretations.

Integration of vectors, line integral, surface integral, volume integral, Green, Stoke's and Gauss theorems (without proof) and their simple applications.

TEXT BOOKS :

1. Advanced Engineering Mathematics : F. Kreyszig.
2. Higher Engineering Mathematics : B.S. Grewal.

REFERENCE BOOKS :

1. Engineering Mathematics Part-I : S.S. Sastry.
2. Differential and Integral Calculus : Piskunov.
3. Advanced Engineering Mathematics : R.K. Jain and S.R.K.Iyengar
4. Advanced Engg. Mathematics : Michael D. Greenberg

Note:

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

PHY 101B ENGINEERING PHYSICS - I							
B. Tech. Semester - I (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

PHYSICAL OPTICS:

Interference: Division of wave front-Fresnel's Biprism, Division of amplitude – Newton's rings, Michelson interferometer, applications.

Diffraction : Difference between Fraunhofer and Fresnel diffraction, Fraunhofer diffraction through a slit, Plane transmission diffraction grating and its spectra, dispersive and resolving powers.

Polarization : Polarised and unpolarized light, double refraction, Nicol prism, quarter and half wave plates, Plane, Elliptically & circularly polarised light, Polarimetry: Biquartz and Laurent's half-shade polarimeters.

UNIT-II

LASER & FIBRE OPTICS: Introduction, Spontaneous and stimulated emissions, Laser action, characteristics of laser beam, Ruby laser, He-Ne, Nd-Yag and semiconductor lasers, applications of laser.

Introduction, Propagation of light in fibres, Types of fiber (pulse & continuous), numerical aperture, Modes of propagation in optical fibre, application of optical fibre.

ACOUSTIC OF BUILDINGS: Introduction, Reverberation, Sabine's formula for reverberation time, Absorption coefficient and its measurements, factors affecting the architectural acoustics and their remedy, Sound absorbing materials.

UNIT-III

TRANSMISSION OF HEAT AND THERMAL RADIATION

Modes of transmission of heat, Thermal conductivity, Rectilinear flow of heat through a rod, Radial flow of heat through a spherical shell, determination of Thermal conductivity of good and bad conductors.

Black body, Emissive and Absorptive Powers, Wein's Displacement Law, Kirchhoff's Law, Stefan's Law, Determination of Stefan's Constant.

UNIT-IV

NUCLEAR & ELEMENTARY IDEA OF PARTICLE PHYSICS

Outline of interaction of charged particles and of Gamma-rays with matter. Counters: Gas filled counters (Ionization Chamber, Proportional Counter and G M Counter). Detector: Scintillation detector, Semiconductor detectors (p-n junction detector), Biological effects of nuclear radiation.

Introduction to elementary particles, Interaction in particle physics: strong, electromagnetic, weak and gravitational. .

TEXT BOOKS :

1. A text book of Optics – Brij Lal and Subramanyam
2. Perspectives of Modern Physics - Arthur Beiser (TMH)
3. Modern Engineering Physics – A.S. Vasudeva (S. Chand)
4. Engineering Physics by R.K. Gaur and S.L. Gupta
5. Engineering Physics by H.K Malik and A.K. Singh (Tata McGraw Hill).
7. Engineering Physics by S.P. Taneja (Chand Pub.)

REFERENCE BOOKS:

1.. Physics Vol-I & II – Resnick & Halliday (Wiley Eastern)
2. Heat and Thermodynamics – M.N. Saha & B.N. Srivastava
3. Nuclear Physics Principles and Applications by John Lilley(Wiley-India).

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed

ME 101B MANUFACTURING PROCESSES

B. Tech. Semester – I/II (Common for all Branches)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT-I

INTRODUCTION: Introduction to Manufacturing Processes and their Classification , automation in manufacturing, Industrial Safety; Introduction, Types of Accidents, Causes and Common Sources of Accidents, Methods of Safety, Electric Safety Measures, First Aid.

Plant Layout, Principles of Plant Layout, Objectives of Layout, Types of Plant and shop layouts and their Advantages.

UNIT-II

ENGINEERING MATERIALS: General Properties and Applications of Engineering Materials, Mild Steel, Medium Carbon Steel, High Carbon Steel, High Speed Steel and Cast Iron, Non-Ferrous Materials, Shop's Tools Materials, Super Alloys or High Temperature Materials

Foundry: Introduction to Casting Processes, Basic Steps in Casting Process, Pattern, Types of Patterns, Pattern allowances, Risers, Runners, Gates, Molding Sand and its composition, Sand Preparation, Molding Methods, Core Sands and Core Making, Core Assembly, Mold Assembly, Melting (Cupola) and Pouring, Fettling, Casting Defects and Remedies. Testing of Castings

UNIT-III

COLD WORKING (SHEET METAL WORK): Sheet Metal Operations, Measuring, Layout Marking, Shearing, Punching, Blanking, Piercing, Forming, Bending and Joining - Advantages and Limitations. Hot Working Processes: Introduction to Hot Working, Principles of Hot Working Processes, Forging, Rolling, Extrusion, Wire Drawing.

INTRODUCTION TO MACHINE TOOLS: Specifications and Uses of commonly used Machine Tools in a Workshop such as Lathe, Shaper, Planer, Milling, Drilling, Slotter, Introduction to Metal Cutting. Nomenclature of a Single Points Cutting Tool and Tool Wear, Mechanics of Chips Formation, Type of Chips, Use of Coolants in machining.

UNIT-IV

WELDING: Introduction to Welding, Classification of Welding Processes, Gas Welding: Oxy-Acetylene Welding, Resistance Welding; Spot and Seam Welding, Arc Welding: Metal Arc, TIG & MIG Welding, Welding Defects and Remedies, Soldering & Brazing, Comparisons among Welding, Brazing and Soldering

Surface Finishing Processes, Introduction to Heat Treatment Processes, Estimating of Manufacturing Cost

Text Books:

1. Workshop Technology Vol. I & II - Hazra & Chaudhary, Asian Book Comp., New Delhi.
2. Process and Materials of Manufacture -- Lindberg, R.A. Prentice Hall of India,New Delhi.
3. Principles of Manufacturing Materials and Processes - Campbell, J.S.- McGraw- Hill.

Reference Books:

1. Manufacturing Science - Amitabha Ghosh & Ashok Kumar Malik, - East-West Press.
2. Manufacturing Process and Systems - Ostwald, Munoz , John Wiley.
3. Workshop Technology, Vol. 1, 2 & 3 – Chapman, WAJ, Edward Arnold.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed

CH 101B ENGINEERING CHEMISTRY

B. Tech. Semester – I/II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

THERMODYNAMICS –Second law, concept of entropy ,entropy change for ideal gas, free energy and work functions, free energy change ,chemical potential, Gibb's Helmholtz equation, Clausius – Clapeyron equation. Related numerical problems with above topics.

PHASE-RULE- Terminology, Derivation of Gibb's Phase Rule equation ,One component system(water system), Two components systems, system with Eutectic point (Pb-Ag), system with congruent melting point (Zn-Mg), system with incongruent melting point (Na-K), Applications of above systems. Elementary idea of Zone refining and Zone levelling

UNIT-II

WATER AND ITS TREATMENT- Hardness of water and its determination, units of hardness, alkalinity of water and its determination, related numerical problems ,water softening, Ion-exchange process, mixed bed demineralisation, desalination of water by using different methods.

CORROSION AND ITS PREVENTION: Galvanic & concentration cell, dry and wet corrosion, Electrochemical theory of corrosion, Galvanic corrosion, Pitting corrosion , differential aeration corrosion, water line corrosion, stress corrosion, factor effecting corrosion, Preventing measures, electroless Plating of Ni and Cu.

UNIT-III

POLYMERS AND POLYMERIZATION: Organic polymers, polymerisation, various types of polymerisation, effect of structure on properties of polymers, preparation properties and technical applications of thermoplastics (PE, PVC, PVA, Teflon), thermosets (PF, UF & MF) and elastomers (Synthetic Rubber including SBR, Buna-S, Buna-N, Thiokol & Polyurethanes) , Inorganic polymers (general properties) , Glass transition temperature, silicones

COMPOSITE MATERIALS & THEIR APPLICATION: optical fibres, Fullerenes ,organic electronic material ,composite materials & their classification, constituents of composites, role of interface in composite performance and durability, fiber –Reinforced composite, advantage and applications of composites.

UNIT-IV

LUBRICANTS AND FUELS: Friction, mechanism of lubrication, classification and properties of lubricants and selection of Lubricants, Definition and classification of fuel, Calorific value and methods of its determination.

Analytical methods: Thermal methods; Principle, method and application of TGA,DTA & DSC, interaction of E.M radiation with a molecule and origin of spectrum, Vibrational & electronic spectra (Experimental details are excluded), spectrophotometry, , conductometeric titrations, elementary discussion on Flame-photometery.

TEXT/ REFERENCE BOOKS:

1. Physical Chemistry, P.W. Atkins (ELBS, Oxford Press).

2. Physical Chemistry, W.J. Moore (Orient-Longman).

3. Instrumental methods of Chemical Analysis, MERITT & WILLARD (East-West Press).

4. Chemistry in Engineering & Tech., Vol.I& II, Rajaram, Kuriacose (TMH)

5.Engineering Chemistry ,ShashiChawla (DhanpatRai and co.)

6. Engineering Chemistry, P.C. Jain, Monica Jain (DhanpatRai& Co.).

7.Engeenring chemistry ,S.S Dara (S.chand&co.)

Note:

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

EE 101B			**PRINCIPLES OF ELECTRICAL ENGINEERING**				
B. Tech. Semester – I/II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

D.C. CIRCUIT ANALYSIS: Basic concepts of electric circuits, Ohm's Law, Independent energy sources, Dependent energy sources, passive elements, circuit properties, Kirchoff's laws, applications of Kirchoff's laws, Nodal and Loop methods of Analysis, , Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Reciprocity Theorem, Maximum Power Transfer Theorem, Millman's Theorem, Star-Delta or delta-star transformation, Applications of network theorems P-spice for DC circuit analysis.

UNIT-II

A.C. CIRCUITS: Sinusoidal signal, Phasors, polar & rectangular, exponential & trigonometric representations, Resistance, Inductance & Capacitance components, behavior of these components in A.C. circuits, Phasor relationship for circuit elements, Impedance & Admittance, instantaneous & peak values, average and RMS values, active power, reactive power, apparent power, power factor, complex power, behavior of AC series , parallel circuits, RL, RC & RLC A.C. circuits (series

and parallel), Resonance-series and parallel R-L-C Circuits, Q-factor, cut-off frequencies & bandwidth.

UNIT-III

THREE PHASE CIRCUITS: Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by two wattmeter method.

Measuring Instruments: Principle, Construction & working of moving coil type voltmeter & ammeter, moving iron type voltmeter & ammeter, Electrodynamic type wattmeter, single-phase induction type energy meter.

UNIT- IV

TRANSFORMERS: Ampere's law, Mutual Inductance, Construction, Working principle and phasor diagrams of Single-phase Transformer, Emf equation, Equivalent circuit, testing, efficiency and regulation of single-phase transformer, Auto transformer.

ROTATING MACHINES: Construction and working principle of dc motor and generator and its characteristics. Construction and working principle of 3-phase Induction machines & 3-phase synchronous machines, torque-speed characteristics.

TEXT BOOKS:

1. Basic Electrical Engg (2nd Edition) : Kothari & Nagarath, TMH
2. Electrical Technology (Vol-I): B.L Theraja & A K Theraja, S.Chand
3. Fundamental of electrical Engineering, Rajendra Prasad, PHI, Edition 2005.
4. Basic Electrical Engineering, V.N Mittle & Arvind Mittal, TMH, Second Edition
5. Basic Electrical Engineering, S.N. Singh, PHI

REFERENCE BOOKS:

1. Electrical Engineering Fundamentals: Deltoro, PHI
2. Basic Electrical Engineering (TMH WBUT Series), Abhijit Chakrabarti & Sudipta Nath, TMH
3. Basic Electrical Engineering, T.K. Nagsarkar & M.S. Sukhija, Oxford
4. Introduction to Electrical Engineering, M.S. Naidu & S, Kamakshaiah, TMH
5. Basic Electrical Engineering, J.J. Cathey & S.A Nasar, TMH, Second Edition.

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CSE 101B INTRODUCTION TO COMPUTERS AND PROGRAMMING							
B. Tech. Semester – I/II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

AN INTRODUCTION OF COMPUTER SYSTEM: Anatomy of a digital Computer, Different Units of Computer System, Classification of Computer Systems, Radix Number systems. Binary codes: BCD, Gray, EBCDIC, ASCII

OPERATING SYSTEM: Operating System Concepts, Operating System services, Types of Operating Systems.

Introduction to PC Operating Systems: Unix/Linux, DOS, Windows.

UNIT-II

PROGRAMMING LANGUAGES AND ALGORITHMS: Machine, Assembly and High Level Language; Assembler, Linker, Loader, Compiler, Interpreter, debuggers, Programming fundamentals: problem definition, algorithms, flowcharts and their symbols

COMPUTER NETWORKS: Basic concepts of Computer Networks, Working of Internet and its Major features. Network Topologies: Bus, Star, Ring, Hybrid, Tree, Complete, Irregular; Types of Networks: LAN, MAN and WAN.

Electronic Mail: advantages and disadvantages, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, Newsgroups, mailing lists, chat rooms.

UNIT-III

BASICS OF 'C' LANGUAGE C Fundamentals, Basic data types, local and external variables and scope, formatted input/ output, expressions, selection statements, loops and their applications; arrays, functions, recursive functions, pointers and arrays. Strings literals, arrays of strings; applications, Structures, Unions and Enumerations.

UNIT-IV

ADVANCED FEATURES OF 'C' LANGUAGE

preprocessor directives, macro definition, conditional compilation, storage classes, type's qualifiers, Low level programming (Bitwise operators, Bit fields in structures, other low level techniques), error handling, file operations(low level/high level).

BOOKS

1. The C Programming Language by Dennis M Ritchie, Brian W. Kernigham, 1988, PHI.
2. Fundamentals of Computing and C Programming, R. B. Patel, Khanna Publications, 2010, New Delhi.
3. Information technology, Dennis P. Curtin, Kim Foley, Kunal Sen, Cathleen Morin, 1998, TMH
4. Theory and problem of programming with C, Byron C Gottfried, TMH
5. Using Computers and Information by Jack B. Rochester, 1996, Que Education & Training.
6. C Programming – A modern approach by K.N. King, 1996, WW Norton & Co.

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

ME 103 B ENGINEERING GRAPHICS AND DRAWING

B. Tech. Semester – I/II (Common for all Branches)

L	T	P	Credits			
1	--	4	3	Class Work	:	40 Marks
				Examination	:	60Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

BASICS OF ENGINEERING GRAPHICS AND DRAWING – Drawing Papers, Minidrafter, Pencils. Drawing Paper Layout, Title Block, Types of Lines, Lettering, Dimensioning, types of Projections; First and Third Angle systems of Orthographic Projections. Projection of Points in different Quadrants.

PROJECTIONS OF STRAIGHT LINES – Contained by both Reference Planes, Contained by one and inclined to other Reference Plane, Contained by one and Parallel to other Reference Plane, Parallel to both Reference Plane, Perpendicular to one of the Reference Planes, Inclined to one Plane but Parallel to the other Reference Planes, Inclined to both the Reference Planes, True Length of a Line and its Inclination with Reference Planes, Traces of a Line.

UNIT II

PROJECTIONS OF PLANES – Parallel to one Reference Plane, Inclined to one Plane but Perpendicular to the other, Inclined to both Reference Planes.

PROJECTIONS OF POLYHEDRAL SOLIDS AND SOLIDS OF REVOLUTION- in simple positions with axis perpendicular to a Reference Plane, with axis parallel to both Reference Planes, with axis parallel to one Reference Plane and inclined to the other Reference Plane, Projections of sections of Prisms, Pyramids, Cylinders and Cones. True Shape of Sections of Solids.

UNIT III

DEVELOPMENT - Development of Surfaces of various Solids objects.

FREE HAND SKETCHING - Orthographic Views from Isometric, Views of Simple Machine Components such as Brackets, Bearing Blocks, Guiding Blocks and Simple Couplings and Pipe Joints.

UNIT IV

ISOMETRIC PROJECTIONS - Introduction, Isometric Scale, Isometric Views and Drawing of various Plane and Solids objects. Perspective drawing and oblique view.

Orthographic Drawings - Screw Threads, Bolts, Nuts and Washers, Bolted, Riveted and Welded Joints

Text Books:

1. Engineering Drawing: MB Shah and BC Rana, Pearsons
2. Engineering Graphics and Drafting: P.S. Gill, S.K. Kataria and Sons.

Reference Books:

1. A Text Book of Engineering Drawing: RK Dhawan, S Chand & Company
2. Engineering Drawing Plane and Solid Geometry : N.D. Bhatt, Charotar Publishing House.

Note:

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

ME 105 B ELEMENTS OF MECHANICAL ENGINEERING

B. Tech. Semester – I/II (Common for all Branches)

L	T	P	Credits	Class Work	:	25 Marks
3	1	--	4	Examination	:	75Marks

Total	**:**	**100 Marks**
Duration of Examination	**:**	**3 Hours**

UNIT-I

THERMODYNAMICS- Elementary definitions in thermodynamics, fundamentals of first and 2nd law of thermodynamic- concept of internal energy, enthalpy and entropy, heat pump and refrigerator, elementary numerical problems.

PROPERTIES OF STEAM & BOILERS: properties of steam, use of steam tables and mollier diagram, measurement of dryness fraction of steam, Carnot and Rankin cycle, elementary numerical problems. Classification of boilers, Comparison of water and fire tube boilers mounting and accessories with their functions, Constructional and operational details of Cochran and Babcock and Wilcox boilers, elementary numerical problems.

STEAM TURBINES AND CONDENSERS: Classification of turbines and their working principles, Types of condensers and their uses.

UNIT-II

I.C. ENGINES AND GAS TURBINES: Introduction, Classification, Constructional details and working of two-stroke and four-stroke diesel and petrol engines, Efficiency of Otto & Diesel cycles , Working principle of gas turbine, elementary numerical problems.

REFRIGERATION AND AIR CONDITIONING- rating of refrigeration machine, coefficient of performance, simple vapor compression cycle, fundamentals of air conditioning, use of Psychrometric charts.

UNIT-III

WATER TURBINES AND PUMPS : Introduction, Classification, Construction details and working principle of Pelton, Francis and Kaplan turbines, Classification of water pumps and construction detail & working principle of centrifugal pump.

SIMPLE LIFTING MACHINES: Definition of machine, Velocity ratio, Mechanical advantage, Efficiency, Laws of machines, Reversibility of machine, Wheel and axle, Differential pulley block, Single, double and triple start worm and worm wheel, Single and double purchase winch crabs, Simple and compound screw jacks, elementary numerical problems.

UNIT-IV

INTRODUCTION TO POWER TRANSMISSION AND DEVICES: Belt drive, Rope drive, Chain drive, Types of gear and Gear train, Types and function of clutches, Types and function of brakes.

STRESSES AND STRAINS: Introduction, Concept & types of Stresses and strains, Poison's ratio, stresses and strains in simple and compound bars under axial loading, Stress-strain diagrams, Hooks law, Elastic constants & their relationships. Concept of shear force and bending moments in beams, elementary numerical problems.

TEXT BOOKS:

1. Hydraulic and Fluid Mechanics – Modi and Seth, Pub. – Standard Book House, New Delhi
2. Engineering Thermodynamics – C.P. Arora, Pub. - TMH, New Delhi
3. Thermal Engineering – A.S. Sarad, Pub. - Satya Prakashan, New Delhi.
4. Engineering Mechanics – K.L. Kumar, Pub. - TMH, New Delhi.
5. Theory of Machines – S.S. Rattan, Pub. – TMH, New Delhi.

REFERENCE BOOKS:

1. Strength of Materials – Popov, Pub. - PHI, New Delhi.
2. Hydraulic Machines – Jagdish Lal, Pub.- Metropolitan, Allahbad.
3. Thermal Science and Engineering – D.S. Kumar, Pub. – Kateria & Sons, New Delhi.

Note:

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

PHY 103B PHYSICS LAB – I							
B. Tech. Semester - I (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**20Marks**
--	**--**	**2**	**1**		**Examination**	**:**	**30Marks**
					Total	**:**	**50 Marks**
					Duration of Examination	**:**	**3 Hours**

Note: Students will be required to perform 10 experiments in a semester.

LIST OF EXPERIMENTS

1. To find the wavelength of sodium light by using Newton's rings experimental setup.
2. To find the wavelength of sodium light by Fresnel's biprism experimental setup
3. To find the wavelength of various colours of white light with the help of a plane transmission diffraction grating.
4. To find the refractive index and Cauchy's constants of a prism by using spectrometer.
5. To find the wavelength of sodium light by using Michelson interferometer.
6. To find the resolving power of a telescope.
7. To find the pitch of a screw using He-Ne laser.
8. To find the specific rotation of sugar solution by using a polarimeter.
9. To compare the capacitances of two capacitors by De'sauty bridge.
10. To find the flashing and quenching potentials of Argon and also to find the

capacitance of unknown capacitor.

11. To study the photo conducting cell and hence to verify the inverse square law.
12. To find the temperature co-efficient of resistance by using platinum resistance thermometer and Callender and Griffith bridge.
13. To find the frequency of A.C. mains by using sonometer.
14. To find the velocity of ultrasonic waves in non-conducting medium by piezo-electric method.
15. To determine the value of Stefan's constant.
16. To find the coefficient of thermal conductivity of a good conductor by Searle's method.
17. To determine the coefficient of thermal conductivity of a bad conductor by Lee and Charlton method.

RECOMMENDED BOOKS :

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

ME 107B WORKSHOP PRACTICE							
B. Tech. Semester – I/II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**40 Marks**
--	**--**	**4**	**2**		**Examination**	**:**	**60Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

LIST OF EXPERIMENTS / JOBS

1. To study different types of measuring tools/instruments used in metrology and determine least counts of vernier calipers, micrometers and vernier height gauges.
2. To study different types of machine tools (lathe, shaper, planer, slotter, milling, drilling machines).
3. To prepare a job on a lathe involving facing, outside turning, taper turning, step turning, radius making and parting-off.
4. To study different types of fitting tools and marking tools used in fitting practice.
5. To prepare lay out on a metal sheet by making and prepare rectangular tray, pipe shaped components e.g. funnel.
6. To prepare joints for welding suitable for butt welding and lap welding.
7. To study various types of carpentry tools and prepare simple types of at least two wooden joints.
8. To prepare simple engineering components/ shapes by forging.
9. To prepare mold and core assembly, to put metal in the mold and fettle the casting.

10. To prepare horizontal surface/ vertical surface/ curved surface/ slots or V-grooves on a shaper/ planner.
11. To prepare a job involving side and face milling on a milling machine.
12. To study of CNC lathe, CNC Milling and EDM Machines.

Note: 1. At least ten experiments/ jobs are to be performed/ prepared by students in the semester.

2. At least 8 experiments/ jobs should be performed / prepared from the above list, remaining two may either be performed/ prepared from the above list or designed and set as per the scope of the syllabus of Manufacturing Processes.

CH 103B CHEMISTRY LAB.							
B. Tech. Semester – I/II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**20 Marks**
--	**--**	**2**	**1**		**Examination**	**:**	**30Marks**
					Total	**:**	**50 Marks**
					Duration of Examination	**:**	**3 Hours**

LIST OF EXPERIMENTS

1. Determination of Ca++ and Mg++ hardness of water sample using EDTA solution.
2. Determination of alkalinity of water sample.
3. Determination of dissolved oxygen (DO) in the given water sample.
4. To find the melting and eutectic point for a two component system by using method of cooling curve.
5. Determination of viscosity of lubricant by red wood viscometer(No. 1 & No. 2).
6. To determine Flash point & Fire point of an oil by Pensky-Marten's flash point apparatus and by Abel's closed cup apparatus..
7. To prepare Phenol-formaldehyde and urea- formaldehyde resin.
8. To find out saponification No. of an oil..
9. Determination of concentration of KMnO4 solution spectrophotometerically.

10. Determination of strength of HCl solution by titrating it against NaOH solution conductometrically.
11. To determine amount of sodium and potassium in a given water sample by flame photometer
12. Estimation of total iron in an iron alloy.

Suggested Books:

1. A Text book on Experiments and Calculation –Engineering Chemistry by S.S.Dara, S.Chand & Company Ltd.
2. Essential of Experimental Engineering chemistry, Shashi Chawla, Dhanpat Rai Publishing Co.
3. Theory & Practice Applied Chemistry – O.P.Virmani, A.K. Narula(New Age).

Note:

1. The student will be required to perform 10 experiments/exercises from the above list and any other two experiments designed by the department based on the theory course (course code101B Course Name Chemistry)
2. The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator are prohibited in the examination.
3. Electronic gadgets including Cellular phones are not allowed in the examinati

EE 103B PRINCIPLES OF ELECTRICAL ENGINEERING LAB

B. Tech. Semester – I/II (Common for all Branches)

L	T	P	Credits			
--	--	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

LIST OF EXPERIMENTS

1. To verify KCL and KVL.
2. To verify Thevenin's & Norton's Theorems.
3. To verify maximum power transfer theorem in D.C. Circuit.
4. To verify reciprocity theorem.
5. To verify Superposition theorem.
6. To study frequency response of a series R-L-C circuit and determine resonant frequency & Q-factor for various Values of R, L, C.
7. To study frequency response of a parallel R-L-C circuit and determine resonant frequency & Q -Factor for various values of R, L, C.
8. To perform direct load test of a transformer and plot efficiency Vs load characteristic.
9. To perform direct load test of a D.C. shunt generator and plot load voltage Vs load current curve.
10. To study various type of meters.
11. .Measurement of power by three voltmeters / three ammeters method.

12. Measurement of power in a three phase system by two watt meter method.

Note:

1. **At least 10 experiments are to be performed by students in the semester.**
2. **At least 8 experiments should be performed from the above list; remaining two experiments may either be performed from the above list or designed and set by the Dept. as per the scope of the syllabus of EE101B.**

CSE 103B COMPUTER PROGRAMMING LAB							
B. Tech. Semester – I/II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**20 Marks**
--	**--**	**2**	**1**		**Examination**	**:**	**30Marks**
					Total	**:**	**50 Marks**
					Duration of Examination	**:**	**3 Hours**

LIST OF PRACTICAL PROBLEMS

1. Write a program to find the largest of three numbers. (if-then-else)
2. Write a program to find the largest number out of ten numbers (for-statement)
3. Write a program to find the average mail height & average female heights in the class (input is in form of sex code, height).
4. Write a program to find roots of quadratic equation using functions and switch statements.
5. Write a program using arrays to find the largest and second largest no. out of given 50 nos.
6. Write a program to multiply two matrices.
7. Write a program to sort numbers using the Quicksort Algorithm.
8. Represent a deck of playing cards using arrays.
9. Write a program to check that the input string is a palindrome or not.
10. Write a program to read a string and write it in reverse order.
11. Write a program to concatenate two strings.
12. Write a program which manipulates structures (write, read, and update records).
13. Write a program which creates a file and writes into it supplied input.
14. Write a program which manipulates structures into files (write, read, and update records).

Note: At least 5 to 10 more exercises to be given by the teacher concerned

ME 109 B ELEMENTS OF MECHANICAL ENGINEERING LAB.

B. Tech. Semester – I/II (Common for all Branches)

L	T	P	Credits			
--	--	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

LIST OF EXPERIMENTS

1. To study Cochran & Babcock & Wilcox boilers.
2. To study the working & function of mountings & accessories in boilers.
3. To study 2-Stroke & 4-Stroke diesel engines.
4. To study 2-Stroke & 4-Stroke petrol engines.
5. To calculate the V.R., M.A. & efficiency of single, double & triple start worm & worm wheel.
6. To calculate the V.R., M.A. & efficiency of single & double purchase winch crabs.
7. To draw the SF & BM diagrams of a simply supported beam with concentrated loads.
8. To study the simple & compound screw jacks and find their MA, VR & efficiency.
9. To study the constructional features & working of Pelton Turbine.
10. To prepare stress-strain diagram for mild steel & cast iron specimens under tension and compression respectively on a Universal testing machine.

Note: 1. Total ten experiments are to be performed in the Semester.

2. **At least eight experiments should be performed from the above list. Remaining three experiments should be performed as designed & set as per the scope of the syllabus of ME105B: Elements of Mechanical Engineering.**

MATH 102B MATHEMATICS – II

B. Tech. Semester - II (Common for all Branches)

L	T	P	Credits			
3	1	--	4	Class Work	:	75 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT-I

ORDINARY DIFFERENTIAL EQUATIONS & ITS APPLICATIONS : Exact differential equations. Equations reducible to exact differential equations. Applications of Differential equations of first order & first degree to simple electric circuits, Newton's law of cooling, heat flow and orthogonal trajectories.

LINEAR DIFFERENTIAL EQUATIONS OF SECOND AND HIGHER ORDER. Complete solution, complementary function and particular integral, method of variation of parameters to find particular Integral, Cauchy's and Legender's linear equations, simultaneous linear equations with constant co-efficients.

UNIT-II

LAPLACE TRANSFORMS AND ITS APPLICATIONS : Laplace transforms of elementary functions, properties of Laplace transforms, existence conditions, transforms of derivaties, transforms of integrals, multiplication by t^n, division by t. Evaluation of integrals by Laplace transforms. Laplace transform of Unit step function, unit impulse function and periodic function. Inverse transforms, convolution theorem, application to linear differential equations and simultaneous linear differential equations with constant coefficients.

UNIT-III

FUNCTIONS OF COMPLEX VARIABLE : Definition, Exponential function, Trignometric and Hyperbolic functions, Logrithmic functions. Limit and Continuity of a function, Differnetiability and Analyticity.

Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy-Integral theorem and formula.

Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series. Zeroes and singularities of complex functions, Residues

UNIT-IV

FOURIER SERIES AND FOURIER TRANSFORMS : Euler's formulae, conditions for a Fourier

expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and consine series.
Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

TEXT BOOKS :
1. Advanced Engg. Mathematics F Kreyszig
2. Higher Engg. Mathematics B.S. Grewal

REFERENCE BOOKS:
1. Differential Equations – H.T.H. Piaggio.
2. Elements of Partial Differential Equations – I.N. Sneddon.
3. Advanced Engineering Mathematics – R.K. Jain, S.R.K.Iyengar.
4. Advanced Engg. Mathematics – Michael D. Greenberg.

Note:
1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

PHY 102B ENGINEERING PHYSICS – II							
B. Tech. Semester - II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT-I

ELECTRODYNAMICS & QUANTUM PHYSICS

Introduction, Displacement current, Equation of continuity, Gauss's Law in dielectric, applications of Gauss's law, Maxwell's equations (both differential and integral form), plane e.m. wave equations in free space, dielectric and conducting medium; Poynting vector.

Difficulties with Classical physics, Introduction to quantum mechanics-simple concepts, Black Body radiations, Planck's Law of radiation and its limitations, Group velocity and phase velocity, Schrodinger wave equations, Application of Schrodinger Equations (Particle in a box).

UNIT-II

CRYSTAL STRUCTURE

Space Lattice, unit cell and translation vectors, Miller indices, Bravis lattice structure in 3D, simple crystal structure (NaCl, ZnS and CsCl2), Elementary idea of reciprocal lattice, Ewald Construction, Experimental x-ray diffraction method, Laue method, powder Method.

FREE ELECTION THEORY

Elements of classical free electron theory , Drude's Theory of Conduction and its

limitations, quantum theory of free electrons, Fermi level, Density of states, Fermi-Dirac distribution function, Thermionic emission, Richardson's equation.

UNIT-III

BAND THEORY OF SOLIDS

Origin of energy bands, Kronig, Penney Model (qualitative), E-K diagrams, Brillouin Zones, Concept of effective mass and holes, Classification of solids into metals, Semiconductors and insulators, Fermi energy and its variation with temperature, Conduction in Intrinsic and Extrinsic Semiconductors. Hall Effect and its Applications.

UNIT-IV

SUPERCONDUCTIVITY & NANOSCIENCE

Introduction to superconductivity, Critical temperature, Meissner Effect, Types of Superconductor, London Equations, penetration depth and coherence length, BCS Theory(qualitative ideas), High temperature superconductors.

Concept of Nano-materials, Size dependence of band gap, Top-down and bottom-up approach for preparing nano-materials, MEMS & NEMS, Properties and applications of Fullerene, Graphene, CNT, Nanowires, Nano-composites, Quantum dots..

TEXT BOOKS :

1. Solid State Physics – S.O.Pillai (6th Edition, New Age).
2. Quantum Mechanics – Ghatak & Loknathan.
3. Fundamentals of Solid State Physics – B.S.Saxena, R.C.Gupta & P.N.Saxena (Pragati Prakashan).
4. Solid State Physics by H. Ibach & H. Luth, Springer, Berlin.
5. Engineering Physics by H.K Malik and A.K. Singh (Tata McGraw Hill).
6. Engineering Physics by S.P. Taneja (Chand Pub.)

REFERENCE BOOKS :

1. Introduction to Solid State Physics (VII Ed.) - Charles Kittel (John Wiley).
2. Quantum Mechanics – Powell and Crasemann (Oxford & IBH)
3. Classical Electrodynamics by S.P. Puri (Narosa)
4. Nano-technology- Molecularly Designed Materials: G. M. Chow & K. E. Gonsalves (American Chemical society).

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

ECE 102B BASICS OF ELECTRONICS ENGINEERING							
B. Tech. Semester - II (OPTIONAL- Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75 Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT I

SEMICONDUCTOR PHYSICS, DIODES AND APPLICATIONS: Basic concepts, intrinsic and extrinsic semiconductors, diffusion and drift currents ,Hall effect and its applications-pn junction under open circuit, reverse bias and forward bias conditions, p-n junction in the breakdown region, ideal diode, types of diodes –zener diode, varactor diode, LED and photodiode. Rectifier (half wave and full wave).

AMPLIFIERS: Introduction of different types of BJT amplifiers & their characteristics.

UNIT II

OPERATIONAL AMPLIFIERS: OP-amps, its characteristics, inverting, non-inverting, summing, averaging, scaling ,difference, integrator and differentiator amplifiers.

POWER SUPPLIES: Introduction and working of switched mode power supply (SMPS), voltage regulator.

UNIT III

DIGITAL ELECTRONICS: Binary, Octal and Hexadecimal number system and conversion, Boolean algebra, truth tables of logic gates AND, OR,NOT,EX-OR,EX-NOR, NAND, NOR AND their implementation using diodes transistors, switches and lamps, Universal gates.

ELECTRONIC INSTRUMENTS: Transducers, Role, importance and applications of general purpose test instruments viz. multi meter (digital and analog), cathode ray oscilloscope (CRO), function/ signal generator.

UNIT IV

COMMUNICATION SYSTEM: Modulation, need of modulation, Block diagram of basic communication system, overview of AM, FM and PM.

MICROPROCESSOR: Basics of 8085 & its architecture. Instruction set, Interrupts, Addressing modes.

Reference Books:

1. Sedra A S and Smith K C. "Microelectronic Circuits" New York.Oxford University Press, New York
2. Tocci R J and widner N S "Digital Systems" – Principles and Applications", Pearson Education India , new Delhi .
3. Cooper and Helfric, "Modern Electronic Instrumentation and Measuring Techniques". Prentice Hall of India, New Delhi.
4. Boylestad and Nashelesky, "Electronic Devices and Circuit Theory", Pearson Education India, New Delhi
5. Millman and Grabel, "Microelectronics", Tata McGraw Hill
6. Millman and Halkias, "Electronics Devices and Circuits". Tata McGraw Hill
7. Kennedy and Davis, "Electronic Communication Systems", Tata McGraw Hill
8. Ramesh S. Gaonkar, "Microprocessor Architecture,Programming,and Applications with the 8085",Penram International Publishing.

Note:

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

BT 102B BASICS OF BIOTECHNOLOGY							
B. Tech. Semester – II (OPTIONAL- Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT – I

INTRODUCTION: Nature and scope of Biotechnology.

CELL STRUCTURE AND FUNCTION: Prokaryotes and Eukaryotes- cell wall, cell membrane, nucleus, mitochondria, chloroplast, ribosome, vacuoles, bacteria and viruses: brief descriptions.
Biomolecules: A brief account of structure and functions of carbohydrates, lipids, proteins.

UNIT– II

CELL DIVISION: Mitosis and meiosis
GENES AND CHROMOSOMES: Classical- Mendel's laws and chromosomes, nature of genetic material, DNA and RNA as genetic material, concept of organization of genetic material into chromosomes.
DNA replication: DNA polymerases, replication mechanism.

UNIT-III

GENE EXPRESSION: Central dogma, genetic code, gene expression-a brief account of transcription and translation, housekeeping genes, mutations and their molecular basis.
GENETIC ENGINEERING: An introduction to genetic engineering: cloning (vectors, enzymes), DNA and genomic libraries, transgenics, DNA fingerprinting, genomics.

UNIT – IV

APPLICATIONS OF BIOTECHNOLOGY : Bioprocess and fermentation technology, cell culture, enzyme technology, biological fuel generation, single cell protein, sewage treatment, environmental biotechnology, biotechnology and medicine, biotechnology in agriculture & forestry industry, food and beverage technology, production of biological inventions, safety in biotechnology.

TEXT/ REFERENCE BOOKS:

- Biotechnology, Smith, Cambridge Press.
- Modern Concepts of Biotechnology, H. D. Kumar, Vikas Publishing House (P) Ltd.
- Elements of Biotechnology, P. K. Gupta, Rastogi Publications.

Note:

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

HUM 102B ORAL COMMUNICATION SKILLS							
B. Tech. Semester – II (OPTIONAL- Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

OBJECTIVE

To train students to have proficiency in oral communication through interpersonal communicative situations.

COURSE CONTENT

UNIT I

ESSENTIALS OF SPEAKING SKILLS:

Familiarity with phonetic sound symbols; Transcription of simple words using International Phonetic Alphabet; Use of dictionary to cultivate standard pronunciation and develop phonetic discrimination

UNIT II

SPEAKING SKILLS:

Need and Significance of Effective Oral Communication; Practice of Conversation – Interpersonal and Telephonic Conversation; Formal Group Discussion

UNIT III

NON-VERBAL ELEMENTS IN ORAL COMMUNICATION SKILLS:

Reading Face, eyes, gesture and body posture, time, space and culture in communicative situations; practicing verbal and non-verbal communication (Body Language) to acquire effective Oral communication;

UNIT IV

LISTENING SKILLS:

Essentials of Good Listening, Types of Listening, Barriers in Effective listening, Exercises in

Listening to Talk Shows, Speech Reviews; Practice in English Sounds and

Speech using RP/MRP

RECOMMENDED READING

1. Buck, Gary. *Assessing Listening.* Delhi: Foundation Books (Cambridge University Press), 200.
2. Balasubramanian, T. *A Textbook of English Phonetics for Indian Students.* Chennai: MacMillan,1981 (rpt 2007).
3. Gangal, J.K. *A Practical Course in Spoken English.* New Delhi: PHI, 2011
4. Raman, Meenakshi and Sangeeta Sharma. Communication Skills. Delhi: OUP, 2011
5. Ribbens, Geoff and Richard Thompson. *Body Language*. New York: Hodder & Stoughton, 2007.

CE 102B BASICS OF CIVIL ENGINEERING							
B. Tech. Semester – II (OPTIONAL- Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**25 Marks**
3	**1**	**--**	**4**		**Examination**	**:**	**75Marks**
					Total	**:**	**100 Marks**
					Duration of Examination	**:**	**3 Hours**

UNIT - I

MATERIALS FOR CONSTRUCTION: Stones, Sands, Lime, Bricks, Timber, Steel their Classification and Properties. Different Types of Cement and their Properties, manufacturing of Cement, Concrete, and properties of Concrete, Ingredient of Concrete and Their Functions

Component parts of a Building, Foundation, Masonry Works, Doors and Windows, Floors, Roofs, DPC, Building Services

UNIT - II

SURVEYING : Introduction to Surveying: Definition, importance, classification of surveys, Principle, Leveling: definitions of terms used in leveling, different types of levels, Contours, Definition, representation of reliefs, horizontal equivalent, contour interval, characteristics of contours, methods of contouring, contour gradient, uses of contour maps, Introduction to GIS, GPS and Remote sensing.

UNIT - III

TRANSPORTATION: Various modes and means of transportation, Different types of transport systems, Importance of road transport, History of Road Development, Indian Road Congress. Main features of 20 years road development plans in India, PMGSY

Sources of power, estimation of water power, water budget equation, necessity and importance of harnessing small hydro power plants, Dams, Types of Dams, Location and Impact assessment of a Dam project.

UNIT - IV

GEOTECHNICAL ENGINEERING: History and its applications, Soil Properties, Classification of Soil, Geotechnical and Geophysical investigation of Soil.

IRRIGATION ENGINEERING: Necessity, advantages, disadvantages, impact of irrigation on human environment, need and development of irrigation in India.

Text Books:

1. Basic Civil Engineering, Satheesh Gopi, Pearson.
2. Basic Civil Engineering, Dr. B.C. Punmia, Ashok Kumar Jain, Arun Kr. Jain, Firewall Medi

Reference Books:

1. Surveying by Prof. N. Singh, Tata McGraw Hill, New Delhi
2. Basic Civil Engineering, Rakesh Beohar, Firewall Media
3. Highway Engg. by S. K. Khanna & C.G.Justo, Nem Chand & Bros,Roorkee
4. Water Resources Engineering by Linseley and Franzini
5. Basic Civil Engineering, L.G. Kulkarni A. D. Pawar S. P. Nitsure, Technical Publications.

Note:

1. In the end semester theory examination, the examiner will set nine questions in all, each question will carry equal marks. First question consisting of objective/short answer, sub parts will be set from the complete syllabus and will be compulsory. Remaining eight questions will be distributed among four sections, two questions from each section. Students will be required to answer one question from each unit.

2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

PHY 104B PHYSICS LAB. - II							
B. Tech. Semester - II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Class Work**	**:**	**20 Marks**
--	**--**	**2**	**1**		**Examination**	**:**	**30Marks**
					Total	**:**	**50 Marks**
					Duration of Examination	**:**	**3 Hours**

Note: Students will be required to perform 10 experiments in a semester.

LIST OF EXPERIMENTS

1. To find the low resistance by Carey - Foster's bridge.
2. To find the resistance of a galvanometer by Thomson's constant deflection method using a post office box.
3. To find the value of high resistances by Substitution method.
4. To find the value of high resistances by Leakage method.
5. To study the characteristics of a solar cell and to find the fill factor.
6. To find the value of e/m for electrons by Helical method.
7. To find the ionisation potential of Argon/Mercury using a thyratron tube.
8. To study the variation of magnetic field with distance and to find the radius of coil by Stewart and Gee's apparatus.
9. To study the characteristics of (Cu-Fe, Cu-Constantan) thermo couple.
10. To find the value of Planck's constant by using a photoelectric cell.
11. To find the value of co-efficient of self-inductance by using a Rayleigh bridge.
12. To find the value of Hall Co-efficient of semi-conductor.
13. To study the V-I characteristics of a p-n diode.
14. To find the band gap of intrinsic semi-conductor using four probe method.
15. To calculate the hysteresis loss by tracing a B-H curve.
16. To verify the Truth Table of various Logic Gates.

RECOMMENDED BOOKS :

1. Advanced Practical Physics – B.L. Worshnop and H.T. Flint (KPH)
2. Practical Physics – S.L.Gupta & V.Kumar (Pragati Prakashan).
3. Advanced Practical Physics Vol.I & II – Chauhan & Singh (Pragati Prakashan).

GP 102B GENERAL PROFICIENCY & ETHICS							
B. Tech. Semester – II (Common for all Branches)							
L	**T**	**P**	**Credits**		**Examination**	**:**	**50Marks**
1	**--**	**--**	**2**		**Total**	**:**	**50 Marks**

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him /her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance --------

II. Extra Curricular Activities / Community Service, Hostel Activities **(8 Marks)**

III Technical Activities / Industrial, Educational tour **(8 Marks)**

IV Sports/games **(4 Marks)**

V Moral values & Ethics **(10 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/her achievement and verbal & communicative skill through presentation before the committee. **(20 Marks)**

C. Moral values & Ethics

Syllabus - Introduction to Value Education. Understanding ethics, value system, happiness, prosperity

A minor test / Quiz will be conducted and It will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1 Chairperson of the Department Chairman
2 Senior Most Faculty Counselor Member
3 Vice- Chancellor's Nominee Member

Affiliated Colleges:

1 Director/Principal Chairman

2 Head of the Department/Sr. Faculty Member

3 External Examiner to be appointed by the University Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

GES 201B ENVIRONMENTAL STUDIES

B. Tech. Semester – III/IV (Common for all Branches)

L	T	P	Credit			
3	**--**	**--**	**0**	**Examination**	**:**	**75Marks**
				Total	**:**	**75 Marks**
				Duration of Examination	**:**	**3 Hours**

UNIT – I The Multidisciplinary nature of environmental studies, Definition, scope and importance.

Need for Public awareness

UNIT – II **NATURAL RESOURCES:**

Renewable and non-renewable resources:

Natural resources and associated problems.

a) Forest resources: Use and over-exploitation: deforestation, case studies, Timber exploitation, mining, dams and their effects and forests tribal people.
b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d) Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources; case studies.
f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
   - Role of an individual in conservation of natural resources.
   - Equitable use of resources for sustainable lifestyles.

UNIT- III **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 eco-system:
  a) Forest ecosystem, Grassland ecosystem, Desert ecosystem.
  b) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT- IV **BIODIVERSITY AND ITS CONSERVATIONS**:

- Introduction – Definition: Genetic, species and ecosystem diversity.
- Biogeographically 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.

- Hot-spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.

UNIT – V 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, earthquake, cyclone and landslides.

UNIT – VI SOCIAL ISSUES AND THE ENVIRONMENT:

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

UNIT – VII 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, Woman and Child Welfare.
Role of Information Technology in Environment and human health.
Case Studies.

REFERENCES:

1. Agarwal, K.C. 2001, Environmental Biology, Nidi Pub. Ltd. Bikaner.
2. Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India .
3. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480p.
4. Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).
5. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai. 1195p.
6. De A.K., Environmenal Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment ®.
8. Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ., Press 473p.
9. Hawkins R.E. Encyclopedia of Indian Natural History, Bomaby Natural History Scociety, Bombay (R).
10. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
11. Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Helhi 284p.
12. Mckinney, M.L. & Schoch, RM 1996, Environmental Sciences Systems & Solutions, Web enhanced Edition 639p.
13. Mhaskar A.K., Mater Hazardous, Tekchno-Sciences Publications (TB).
14. Miller T.G. Jr. Environmental Science, Wadsoworth Publishing Co. (TB).
15. Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
16. Rao M.N. & Dutta, A.K. 1987, Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd., 345p
17. Sharma, B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Sciences (TB).

20. Trivedi, R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II Enviro Mdiea (R).
21. Trividi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II Enviro Media (R).
22. Trividi R.K. and P.K. Goel, Introduction to air pollution, Techno Sciences Pub. (TB).
23. Wagner K.D., 1998, Environmental Management, W.B. Saunders Co. Philadelophia, USA 499p.
24. A text bok environmental education G.V.S. Publishers by Dr. J.P. Yadav.

(M) Magazine (R) Reference (TB) Textbook

Note: 1. Examiner will set eight questions. Students will be required to attempt five Questions.
2. The awards of this paper shall not be counted in the award of the Degree/DMC.

CE – 201B: STRENGTH OF MATERIALS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Introduction: Concept of Equilibrium General Equilibrium equations, concept of free body diagrams , Concept of stress and strain, generalized Hooke's law, Stress-strain diagram of ductile and brittle material, compound and composite bars, thermal stresses, Analysis of Principal stresses and Strains, Mohr's stress circle, Relationship among elastic constants.

Shear force and Bending moment diagrams: Types of load on beam and frames, classification of beams, statically determinate and indeterminate problems, shear force and bending moment diagrams: simply supported, overhung and cantilever beams subjected to any combination of point loads, uniformly distributed and varying load and moment, relationship between load, shear force and bending moment.

UNIT – II

Theory of pure bending: Centroid of simple and built up section, second moment of area, derivation of flexural formula for straight beams, bending stress calculation for beams of simple and built up section, RCC beams.

Shear Stresses in Beams: Shear stress formula for beams, shear stress distribution in beams.

UNIT – III

Torsion of Circular shafts: Basic assumptions, torsion formula, power transmitted by shafts, design of solid and Hollow shafts based on strength and stiffness.

Columns & Struts: Column under axial load, concept of instability and buckling, slenderness ratio, derivation of Euler's formulae for the elastic buckling load, Eulers, Rankine, Gordon's formulae Johnson's empirical formula for axial loading columns and their applications, eccentric compression of a short strut of rectangular & circular sections, Numerical.

UNIT - IV

Slope & Deflection: Relationship between bending moment, slope & deflection, Mohr's theorem, moment area method, method of integration, Macaulay's method, calculations for slope and deflection of (i) cantilevers and (ii) simply supported beams with or without overhang under concentrated load, Uniformly distributed loads or combination of concentrated and uniformly distributed loads, Numericals.

Strain energy: strain energy under axial, bending, shear, torsion, gradual, sudden and impact loading, theories of failures

Text Books

1. Strength of Materials by G H Ryder, ELBS publishers
2. Elements of Strength of Materials by Timoshenko & Young, East- West Press, New Delhi
3. Mechanics of Materials by Beer and Johnston, Tata McGraw Hill.
4. Elementary Structural Analysis, Norris & Wilbur, McGraw Hill Publisher
5. Engineering Mechanics Shames

Reference Books

1. Strength of Materials by Sadhu Singh, Khanna Publishers
2. Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.
3. Fundamentals of Solid Mechanics by M L Gambhir, Prentice Hall of India
4. Strength of Materials Ramamurtham and Narayanan, S. Chand & Co.
5. Fundamentals of Structural Analysis B D Nautiyal, New Age Publishers

Note:

1.In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.

2.The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 203B: SURVEYING

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Introduction to Surveying: Definition, importance, Objectives, Maps, Scale, Principles of survey, Classification of surveys, different techniques of surveying, Chain Surveying: Ranging, Chaining, Offsets, Errors in Chaining, Corrections to length measured with a tape

Compass surveying & Plane Table Surveying: Purpose of compass surveying, Comparison of compass surveying and chain surveying, Dip, Magnetic Declination, W.C.B., Q.B., and R.B Introduction to plane table surveying, principle, instruments, working operations, setting up the plane table, centering, leveling, Orientation, methods of plane table survey, danger circle, Lehmann's Rules, errors in plane tabling.

UNIT - II

Leveling: definitions of terms used in leveling, different types of levels, parallax, staves, adjustments, bench marks, classification of leveling, booking and reducing the levels, rise and fall method, line of collimation method, errors in leveling, permanent adjustments, Two peg test, reciprocal leveling, Corrections to curvature and refraction, setting out grades, longitudinal leveling.

Trigonometric Leveling: Definitions & terms, curvature & refraction Methods: direct & reciprocal, eye and object correction, coefficient of refraction. **Contours:** Definition, representation of reliefs, horizontal equivalent, contour interval, characteristics of contours, methods of contouring, contour gradient, uses of contour maps.

UNIT - III

Tachometry: Definitions and terms used in tachometry, angular tachometry with staff vertical and staff inclined, Analytic lens theory, Tachometric field work, tangential method of tachometry, subtense method of tachometry, direct reading tachometer.

Theodolite Traversing: types of theodolities, measurement of angles, temporary and permanent adjustments, closed & open traverse, omitted measurements, consecutive and independent co-ordinates, advantages & disadvantages of traversing closing error, Bowditch, Transit rules.

UNIT - IV

Triangulation: Triangulation systems, classification, strength of figure, selection of triangulation stations, grade of triangulation, field work of triangulation, triangulation computations, Introduction to EDM, Total Station and its working, survey adjustment and treatment of observation, adjustment of triangulation figures by method of least squares.

Curves: Definition, elements of a simple curve, different methods of setting out a simple circular curve, elements of a compound curve, reverse curves, transition curves, their characteristics and setting out, vertical curves, setting out vertical curves, sight distances.

Text Books

1. Surveying by R. Agor, Khanna Publishers, New Delhi
2. Surveying-1 by Sanjay Mahajan, Satya Prakashan, New Delhi
3. Surveying Vol. I and II by B.C. Punmia, Luxmi Publications, New Delhi
4. Syrveying and Levelling by R. Subramanian, Oxford University Press.

Reference Books

1. Surveying by N. Singh, Tata McGraw Hill, New Delhi.
2. A Text Book of Surveying by C.Venkataramiah, Universities Press, Hyderabad

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.

2.The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 205B: FLUID MECHANICS
B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Scope & development of Fluid Mechanics Fluid properties – Density, Specific weight, Viscosity, Kinematic and Dynamic viscosity, Surface tension, Compressibility, Newtonian and Non Newtonian fluids, Types of fluids, capillary action. Kinematics of fluid motion, Classification of flow: Laminar and Turbulent flows, Reynolds experiments. Stream lines, Path lines, Streak lines. Continuity equations in Cartesian coordinates, Rotational and Irrotational flows, Velocity Potential, Stream Function and Flow nets.

UNIT - II

Fluid statics – Absolute and Gauge pressure, Measurement of pressure, Mechanical gauges, Barometers, Piezometers, Simple and Differential manometer, Inclined manometer, and Micro manometer. Hydrostatic forces on plane horizontal, Vertical and Inclined surfaces, Curved surface. Buoyant force, Archimedes principle, Metacentric height, Theoretical and Experimental determination of metacentric height. Stability of floating and submerged bodies, Static fluid subjected to uniform acceleration and fluid rotation about a vertical axis.

UNIT - III

Fluid dynamics and pipe flows – Euler's equation of motion, Bernoulli's equation and its limitations, Momentum equation, Energy and Momentum correction factors, Energy losses in pipe flows, Darcy-Weisbach equation, Estimation of friction factor, Loss at sudden expansion, contraction and bends, Pipe flow computations, Hydraulic gradient and total energy lines, Pipes in series and parallel. Flow measuring devices: Venturimeter and Orifice meters, etc.

UNIT - IV

Laminar flow- Navier stokes equation of motion (no derivation), Laminar flow through pipes, parallel plates, Couttee flow, Flow past a sphere, Stokes law.

Boundary layer - development of boundary layer on a flat surface, boundary layer thickness, laminar and turbulent boundary layers, separation of boundary layer and methods for prevention.

Drag and lift – Definitions, Pressure drag and Friction drag, Stream line and Bluff bodies, Total drag, Drag at different Reynolds numbers, Profile drag. Drag characteristics of two dimensional bodies, Circulation, Lift and Magnus effect, Lift characteristics of Aerofoils.

Text Books:

1. R. J. Garde and Mirajgaonkar, "Engineering Fluid Mechanics", Nem Chand & Brothers, Roorkee.
2. K L Kumar, "Engineering Fluid Mechanics", Eurasia Publishing House.

Reference Book

1. H. Schlichting, "Boundary Layer Theory", McGraw Hill Publishing Company, New York.
2. Fox R. W. and McDonald, A T, "Introduction to Fluid Mechanics", John Wiley Wilson
3. Fluid Mechanics Through Problems, R J Garde, Nem Chand & Brothers, Roorkee
4. Hydraulics and Fluid Mechanics, P N Modi & S M Seth
5. Streeter, V L and Benjamin, W E , "Fluid Mechanics", McGraw Hill.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 207B: BUILDING CONSTRUCTION AND DRAWING

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
3	-	3	4.5	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Components of a building and building specifications, Site preparation and setting out of works, Building layout, Building bye-laws.

Masonry, stone masonry, basic terms, materials for stone masonry, classification, dressing of stones, joints in stone masonry, Brick Masonry, laying tools, basic terms, bonding of bricks, tools, inspection of brickwork, strength of brick work, Cavity walls, features, wall ties, construction of cavity wall, Lintels, classifications, Arches, classification and construction, Temporary works: Formwork and Scaffolding, Drawings.

UNIT - II

Doors & windows: Introduction, location in buildings, basic terms, standard sizes, size of timber, types of doors, fittings for doors, door frames, types of doors, types of windows, standard sizes of windows, drawings

Roofs & roof coverings: types of roofs, pitched roofs, Flat roofs etc, Roof covering: tiles, ACC, Tin & G.I. Sheets with details at joints bearings and ridges. Drawings.

UNIT - III

Earthwork, Damp proof course: Points of its requirement in buildings, D.P.C. at Plinth level, in basement and roof tops etc., Anti-termite treatment, Basement & Retaining walls. Drawings.

Foundation types and suitability, spread, arch, combined, cantilevered, Raft, Grillage, Piles & wells, Footings in block cotton soil, IS Specifications and drawings.

UNIT - IV

Housing: Introduction, definitions, Acoustics and sound proofing, Ventilation and air-conditioning, Fire hazards, fire fighting system means of escape alarms system, Fire prevention measures, maintenance standards, Maintenance of floorings, doors, windows, sanitary appliances, electrical systems and septic tanks.

Stairs & Stair cases: Suitability of location, stairs in multi-storeyed buildings, Residential and public buildings, dimensions, Requirements, classification, types of stairs, Lift & escalators, drawings

Text Books

1. Building Construction by Sushil Kumar, Standard Publisher and Distributors.
2. Building Construction by B. C. Punima, Laxmi Publisher House

Reference Books

1. Indian Practical Civil Engg. Handbook, P N Khanna, Engineers Publishers, 2000.
2. National Building Code, B. I. S.
3. Handbook of Building Construction, M M Goel, Amrindia Consultancy.
4. Building Construction by P C Varghese, PHI
5. Masonry & timber structures including earthquake resistant design, A S Arya, Nem Chand & Bros.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 209B: BUILDING MATERIALS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Mechanical Properties of Materials: Hardness, Creep, Fatigue and fracture, Wear properties. Corrosion Process: Corrosion, Cause of corrosion, types of corrosion, protection against corrosion.

Bricks: Composition of good brick earth, harmful ingredient, manufacture of bricks, characteristics of good bricks, classification of bricks as per IS 1077-1985. Stones: Classification of rocks, test for stones, characteristics of a good building stone, deterioration of stones, common building stones of India, comparison of the brick work and stone work.

UNIT - II

Cement: Types, Manufacture, basic properties of cement compounds, grades, packing, storage, quality control and curing, additives, special cements, testing

Lime: Classifications & Properties, and tests. Preparation, types and tests for mortars

UNIT - III

Timber: Classification and identification of timber, defects in timber, characteristics of good timber, seasoning of timber and its methods, preservation of timber, varieties of industrial timber, famous Indian timber trees, Plywood.

Steel: Manufacture of steel, market forms of steel e.g. mild steel and HYSD steel bars, rolled steel sections, stainless steel

UNIT - IV

Building glasses: characteristics and performance, uses, manufacture and classification, treatment, testing.

Paints and Varnishes: classification, selection criteria, distempers, varnishes, industrial paints, Properties and uses of Bitumenous materials, Flyash, Geosynthetics, Adhesives and Admixtures in civil works.

Text Books

1. Building Materials by P C Varghese, PHI.
2. Engineering Materials, by S.C. Rangawala, Charotar Publishing House, Anand.

Reference Books

1. Engineering Materials, by Sushil Kumar, Metropolitan Press
2. Engineering Materials by N.C. Choudhary, Technical Publishers.
3. Materials Science, J.C. Anderson & KDB Lever, ELBS fifth Edn., 2004.
4. Indian Practical Civil Engg. Handbook, P N Khanna, Engineers Publishers, 2000.
5. National Building Code, B. I. S.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 211B: STRENGTH OF MATERIALS LAB

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
--	--	2	1	Class Work	:	20 Marks
				Examination	:	30 Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments:

1. To determine Rockwell hardness number of the specimen of steel/soft metal.
2. To determine Brinnel hardness number of the specimen of steel/soft metal.
3. To determine Vickers hardness number of the specimen of steel/soft metal.
4. To study the behavior of ductile material under tension on Universal Testing Machine
5. To study the behavior of brittle material under tension on Universal Testing machine
6. To study the behavior of brittle material under comprssionon Universal Testing machine
7. To determine the modulus of rigidity of brass bar on torsion testing machine
8. To determine the impact strength of M.S./C.I. specimen on Izod impact testing machine.
9. To determine the impact strength of M.S./C.I. specimen on Charpy impact testing machine.
10. To determine Young's modulus of the material of a beam simply supported at the ends and carrying a concentrated load at the centre

Note: Seven experiments are to be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE – 213B: SURVEYING LAB

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
--	--	2	1	Class Work	:	20 Marks
				Examination	:	30 Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments

1. Chain Survey of an area
2. Leveling Exercises.
3. Measurement of vertical and horizontal angles with Theodolite.
4. Tachometric Survey
5. Tachometric Constants.
6. Two point / three point problem.
7. Plane table survey of an area.
8. Setting out a simple circular curve by different methods.
9. Setting out transition curve.
10. Measurements with Total Station.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE – 215B: FLUID MECHANICS LAB

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
--	--	2	1	Class Work	:	20 Marks
				Examination	:	30 Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments

1. Verification of Bernoulli's Theorem.
2. Calibration of Venturimeter.
3. Calibration of an orifice meter.
4. Determination of Coefficients of Contraction, Velocity and Discharge of a circular orifice.
5. Determination of friction factor for pipes.
6. Visualization of laminar and turbulent flow and estimating critical Reynold's number.
7. Determination of metacentric height of a ship model.
8. To measure the velocity distribution over a flat surface in a wind tunnel and to determine the Reynold's no. and boundary layer thickness along the plate.
9. To measure the pressure distribution around a cylinder in a wind tunnel and to calculate the coefficient of drag at different Reynold's number.

Note: Students are required to complete at least eight experiments from the above list.

GES 203B ENVIRONMENTAL STUDIES FIELD WORK

B. Tech. Semester – IIIrd (Common for all Branches)

L	T	P	Credits			
--	--	--	0	Field Work	:	25Marks
				Total	:	25 Marks

FIELD WORK:

- Visit to a 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. (Field work equal to 5 lectures hours).

Note: The awards of this paper shall not be counted in the award of the Degree/DMC.

ME 217 B WORKSHOP

B. Tech. Semester – III (Common for all branches)

L	T	P	Credits			
-	-	2	2	Class Work	:	50 Marks
				Duration of Examination	:	3 Hours

Each student has to undergo a workshop atleast 4 weeks (80-100 hours) at the end of II semester during summer vacations. Out of the four weeks, two weeks would be dedicated to general skills and two weeks training for specialized discipline/ department. The evaluation of this training shall be carried out in the III semester

LIST OF JOBS TO BE CARRIED OUT DURING THIS PERIOD

1. To study and prepare different types of jobs on machine tools (lathe, shaper, planer, slotter, milling, drilling machines).
2. To prepare lay out on a metal sheet by making and prepare rectangular tray, pipe shaped components e.g. funnel.
3. To prepare joints for welding suitable for butt welding and lap welding.
4. To study various types of carpentry tools and prepare simple types of wooden joints.
5. To prepare simple engineering components/ shapes by forging.
6. To prepare mold and core assembly, to put metal in the mold and fettle the casting.
7. To study of CNC lathe, CNC Milling and EDM Machines.
8. Any work assigned in electrical workshop, computer hardware/language lab, electronics workshop, biomedical hardware, automobile workshop etc.

This student will prepare job(s)/project as an individual or in a group using workshop in house infrastructure.

The student shall submit a typed report.

Training will be evaluated on the spot out of 50 marks.

The report will be evaluated in the III Semester by a Committee consisting of two teachers.

The student will interact with the committee through presentation to demonstrate his/her learning. The basis of evaluation will primarily be the knowledge and exposure of students on different kinds of Machines/instruments/tools/ skills etc. The committee will evaluate out of 50 marks.

The committee shall submit the awards out of 100 marks.

MGT 201B ENGINEERING ECONOMICS

B. Tech. Semester – III (Common for all Branches Except BT& BME)

L	T	P	Credits			
				Class Work	:	25 Marks

4	**-**	**--**	**4**	**Examination**	**:**	**75Marks**
				Total	**:**	**100 Marks**
				Duration of Examination	**:**	**3 Hours**

COURSE OBJECTIVE: The aims of this course are to:

1. Acquaint the student with the basic economic concepts and their operational significance
2. Stimulate him to think systematically and objectively about cotemporary economic problems.

UNIT-I

Definition of economics- various definitions, nature of Economic problem, Micro and macro economics- their feature and scope, production possibility curve, Economic laws and their nature. Relation between Science, Engineering Technology and Economics. Concept and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility – its practical application and importance**.**

UNIT-II

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve. Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & application of the concept of elasticity of demand. Various concepts of cost-Fixed cost, variable cost, average cost, marginal cost, money cost, real cost, opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT III

Meaning of production and factors of production; Law of variable proportions, Law of Return to Scale, Internet and External economics and diseconomies of scale. Meaning of Market, Type of Marker– perfect Competition, Monopoly, Oligopoly, Monopolistic competition (Main features of these markers).

UNIT-IV

Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices . Nature and characteristics of Indian economy, privatization – meaning, merits and demerits. Globalisation of India economy – merits and demerits. Elementary Concept of WTO & TRIPS agreement, Monitory Policy & Fiscal Policy

TEXT BOOKS:

1. Ahuja H.L"Micro Ecomomic Theory" S. Chand Publication, New Delhi
2. Dewett K.K "Modern Ecomomic Theory" S. Chand Publication, New Delhi
3. Jain T.R, Grover M.L, Ohri V.K Khanna O.P,"Economics for engineers" V.K .Publication ,New Delhi

SUGGESTED BOOKS:

1. Jhingan M.L"Micro Ecomomic Theory" S.Chand Publication ,New Delhi
2. Chopra P.N "Principle of Economics" Kalyani Publishers, Delhi
3. Mishra S.K "Modern Micro Economics" Pragati Publication Mumbai.
4. Dwivedi D.N "Micro Economics " Pearson Education, New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 202B: STRUCTURAL ANALYSIS I

B. Tech. 2nd Year (Semester – IV)

L	**T**	**P**	**Credits**			
3	**2**	**--**	**5**	**Class Work**	**:**	**25 Marks**
				Examination	**:**	**75Marks**
				Total	**:**	**100 Marks**
				Duration of Examination	**:**	**3 Hours**

UNIT I

Analysis of determinate Trusses Introduction, determination of forces in member of trusses by method of joints, method of sections, Deflection of Joints of plane frames by castigliano's first theorem and unit load method.

Analysis of Dams, chimneys and Retaining Walls**:** Introduction, limit of eccentricity for no tension in the section, core of the section, middle third rule, wind pressure on chimneys.

UNIT II

Deflection of Beams Review of Double Integration Method and Macaulay's Method, moment area theorem, conjugate beam method, unit method and strain energy method. Maxwel's reciprocal theorem.

Thin cylinder and Spheres: Introduction, stresses and strains in thin cylinders and spherical shell, volumetric change, wire wound thin cylinders, thin vessels subjected to internal pressure.

UNIT III

Rolling Loads: Introduction to rolling loads and influence lines, Determination of shear force, bending moment at a section and absolute shear force and bending moment due to single point load, uniformly distributed load, several
point loads etc.

Influence Lines: Construction of Influence lines for reaction, shear forces and bending moment for simply supported, overhanging and compound beams, influence lines for girders with floor beams, Influence lines for forces in members of frames.

UNIT IV

Arches: Introduction, Analysis of two hinged, two hinged and fixed arches, spandrel braced arches, Influence lines for horizontal thrust, shear force and bending moment for three hinged and two hinged arches.

Cables and suspension Bridges: Introduction, shape of a loaded cable, cable carrying point loads and UDL, cables with ends at different level, cable subjected to temperature stresses, suspension bridge with two hinged and three hinged stiffening girders, influence lines.

Text Books

1. Elementary Structural Analysis, Norris & Wilbur, McGraw Hill Publisher,
2. Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.
3. C K WANG, " Intermediate Structural Analysis" McGraw Hill Publisher

Reference Books

1. Structural Analysis (A unified approach), D.S. Parkash Rao, University Press.
2. Theory of structures, Punmia and Jain, Luxmi Publications.
3. Structural Analysis Thandvamoorthy TS Oxford University Press
4. Structural Analysis Devdas Menon Narosa Publishing House

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 204B: OPEN CHANNEL FLOW

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit I

Flow in Open Channels: Difference between pipe flow and channel flow, Types of channels, Classification of flows, Sub Critical and Supercritical Flows, Velocity distribution and Uniform flow formulae.

Flow Measurement: Flow over notches and weirs ,Pitot tube floats and current meters for velocity measurement, Flow over Spillways, Sluice gates, free overfall

Unit II

Unsteady flow and Hydraulic jump: Froude number and types of hydraulic jump, Applications Jumps in channels. Unsteady flow equation, Pre jump and post jump depths, length of Hydraulic Jump and energy dissipation, Surges.

Concepts of Specific energy and specific Force: Specific energy and specific curve, Momentum Equation in open channels, Specific force & specific force curve Critical depth and its computation.

Unit III

Gradually Varied Flow: Channel transitions, Non-uniform flow in open channels, Dynamic equation for GVF, Water surface profiles in channels of different slopes GVF flow computations. **Design of Channels:** Design of Channels, Most efficient channel sections

Unit IV

Pumps and Turbines: Reciprocating pumps, their types, work done by single and double acting pumps. Centrifugal pumps, components and parts and working, types, heads of a pump-statics and manometric heads,. Force executed by fluid jet on stationary and moving flat vanes., Turbines-classifications of turbines based on head and specific speed, component and working of Pelton wheel and Francis turbines, cavitation and setting of turbines**.**

Text Books:

1. K.G. Ranga Raju, "Flow Through Open Channels", Tata McGraw Hill, New Delhi.
2. F. M. Hendersen, "Open Channel Flow", McMillan, New York.

Reference Books:

1. K. Subramanya, "Flow in Open Channels", Tata McGraw Hill, New Delhi.
2. R. H. French, "Open-Channel Hydraulics", McGraw Hill Publishing Company, New York.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 206B: GEOMATICS ENGINEERING

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT – I

Introduction to Geomatic Engineering, GIS, GPS, DEM, DTED, History of surveying and mapping, Importance, Maps and maps Numbering systems, Large scale mapping, small scale mapping, Components of GIS, Application of GIS in civil engineering

Remote Sensing, Fundamentals, EMS, RS System, Active and Passive radiation – Electromagnetic Radiation – Nomenclature, Reflectance, Transmission and Absorption, Thermal Emission – Plank's formula, Stefan – Boltzman Law, Wein's Displacement Law; Emissivity – Kirchoff's Law, Characteristics of Solar Radiant Energy, Application of remote sensing to various engineering fields

UNIT – II

Interaction of EMR with Atmosphere – Scattering, Refraction, Absorption, Transmission. Atmospheric Windows.

Interaction of EMR with Earth Surface – Spectral Reflectance Curves. Interaction of earth surface with EM radiation in visible, NIR, TIR and Microwave regions. Idealised & Real sequence of remote sensing.

UNIT – III

Sensors and Platforms: Platforms, Orbital characteristics, Storage and Retrieval of data. IRS satellite systems – Introduction, Stages of development, Sensors, Types of scanning system

Data Processing: Initial data statistics. Pre-processing – Atmospheric, Radiometric and Geometric corrections, Image Histogram, Classification of images

UNIT – IV

Data analysis: Image Interpretation Elements, Keys and Aids. Basic Instrumentation. Visual analysis of data

Photogrammetry: Aaerial and terrestrial, applications, types and geometry of aerial photograph, flight planning, relief displacement, Stereoscopy, photogrammetric mapping, Mosaics

Text Books

1. Geomatic Engineering, Manoj K Arora, RC Badjatiya, Nem Chand & Bros.
2. Remote Sensing and Image Interpretation, by Lillisand, T.M. & Kiefer R.W., John Wiley and Sons.
3. Introduction to Remote Sensing, by Campbell, J.B. Taylor and Francis.
4. Principles of Geographic information systems, Burrough, P.A and MacDonnel, R.a , Oxford University press
5. Concepts and Techniques of GIS, C.P.Lo,Albert K.W.Yeung, PHI

Reference Books

1. Digital Remote Sensing, by Nag. P. & Kudrat, M. Concept Publication Company.
2. Remote Sensing and Photogrammetry – Principles and Applications, by Jhanwar, M.L. and Chouhan, T.S. Vigyan Prakashan, Jodhpur.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 208B: ENGINEERING GEOLOGY

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT – I

Introduction: Divisions of Geology, Importance of Engineering Geology, Geology applied to civil engineering practices. Weathering: Agents and effects, Geological works of rivers, wind, glaciers and oceans as agents of erosion, transportation and deposition, resulting features and engineering importance.

Rocks and Minerals: Classification of rocks for engineering purposes, Rock Quality Designation (RQD). Igneous, sedimentary and metamorphic rocks: their formation and structures. Identification and physical properties of minerals.

UNIT – II

Structural Geology: Stratification, dip and strike, Unconformities: Causes and types of unconformities, Folds: Definition, parts of a fold, classification, causes, relation to engineering operations.

Faults: Definition, parts of a fault, classification, causes, relation to engineering purposes. Joints: Definition, attitude, joint set, joint systems, classification, relation to engineering operations.

UNIT – III

Methods of geological explorations: gravity, electrical and seismic methods, remote sensing techniques, Geology of India. Introduction to GIS, components, database structure,, software packages.

Geological considerations in the Engineering projects: Tunnels and its design considerations, highways, foundations, dams and anchorage of dams, reservoirs. Under ground water in engineering Projects, aquifers, aquicludes, artisan wells.

UNIT – IV

Earthquakes: Definition, terminology, causes, earthquake waves, intensity, vibration quantification and natural damping, recording of earthquakes, seismic zones in India, factors to be considered and methods in earthquake proof construction.

Earth movements: Landslides and land subsidence, elementary idea about classification, factors causing landslides and land subsidence. Preventive measures for landslides viz retaining walls, slope treatment, chemical stabilization and drainage control.

Note: The subject will be treated with special reference to Indian Conditions. A conducted / guided tour through representative geological formations will be planned as a compulsory part of the course covering Stratigraphical, Structural and Petrological aspects.

Text Books:

1. Engineering Geology by Parbin Singh, Kataria and Sons, Ludhiana/Delhi.
2. Geology for Engineers by D.S. Arora, Mohindra Capital Publishers, Chandigarh.

Reference Books:

1. Geology for Civil Engineers by Mcleans & Gribble; E & F Spon, London, U.K.
2. Engineering Geology by Richard E. Goodman, John Wiley and Sons, USA.
3. Engineering Behaviour of Rocks by I.W. Farmer; E & F Spon, London, U.K.
4. Rock Mechanics and Engineering by C. Jeager, Cambridge Univ. Press, London, UK
5. Fundamentals of Rock Mechanics by Jaeger and Cook, Metheun, London, U.K.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 210B: CONCRETE TECHNOLOGY

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
				Class Work	:	25 Marks

3	**-**	**--**	**3**	**Examination**	**:**	**75Marks**
				Total	**:**	**100 Marks**
				Duration of Examination	**:**	**3 Hours**

USE OF RELEVANT INDIAN STANDARDS IS ALLOWED IN THE EXAMINATION

UNIT – I

Constituents of Concrete: Properties of Cement, Tests on cement, Various types of cement & their applications, Bulking of Sand, properties of good sand and functions of sand in mortar and cement concrete, substitutes of sand, Classification of Aggregates, Properties of aggregates – specific gravity, bulk density, porosity, adsorption & moisture content of aggregates, deleterious substance in aggregate, Soundness of aggregate, Grading of coarse and fine aggregates, physical requirements of aggregates, and their tests, Admixtures: their purpose, their types, properties, dosages, effects and usages.

UNIT – II

Properties of Fresh and Hardened Concrete: Properties & Tests of Cement Concrete, Workability, factors affecting workability, measurement of workability by different tests; Strength of concrete and factors affecting it, Water Cement Ratio – Abram's law, Degree of Compaction and Age of Concrete. Development of Strength of Concrete, Methods of Curing, Influence of Temperature, Steam curing, Durability, shrinkage & Creep of Concrete, Factors influencing Creep; Compression tests and Tension Tests, Flexural Tests & Splitting Tests, Freeze and Thaw in Concrete.

UNIT – III

Concrete Mix Design: Principles of Concrete Mix Design, Basic Considerations, Factors in the choice of mix design, outline of mix design procedure, Proportioning of Concrete mixes by various methods – BIS Method of Mix Design, American Concrete Institute, British Standard, Quality control and Acceptance Criterion. Grades of Concrete, stress strain curve, permissible stresses

UNIT – IV

Durability of Concrete: Sulphate attack of concrete, Corrosion of rebar wrt chloride and sulphate attack, Alkali Silica Reaction, Freezing and Thawing, Carbonation of Concrete, Corrosion Measurement Techniques, Prevention of Corrosion

Special Circumstances of Concreting: Hot weather concreting, Cold weather concreting, Underwater concreting, Heavy Concrete, Lightweight Concrete

Text Books:

1. Concrete Technology, by A. M. Neville & J.J. Brooks, Pearson.
2. Concrete Technology, by M. L. Gambhir, Tata McGraw Hill, New Delhi.
3. Concrete Technology, by M.S. Shetty, S. Chand & Co.

Reference Books:

1. Handbook of Mix Design, BIS, New Delhi.
2. Concrete Technology, by A.R. Santhakumar, Oxford University Press.
3. Concrete Microstructure and its Properties by P K Mehta and PJM Monterio
4. IS: 269 1989
5. IS:383 1970
6. IS:10262 2009

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 212B: STRUCTURAL ANALYSIS-I LAB

B. Tech. 2nd Year (Semester – IV)

L	**T**	**P**	**Credits**	**Class Work**	**:**	**20 Marks**
--	**--**	**2**	**1**	**Examination**	**:**	**30 Marks**

Total	**:**	**50 Marks**
Duration of Examination	**:**	**3 Hours**

List of Experiments:

1. To verify Betti's Law
2. To find the deflection of a pine connected truss.
3. To determine the flexural rigidity (EI) of a given beam.
4. To verify Moment-Area Theorems for slope and deflection of a beam.
5. To study the behavior of different types of struts.
6. To obtain experimentally the influence line for the horizontal thrust in a two hinged arch.
7. To determine the elastic displacement of curved members.
8. To determine the horizontal displacement of the roller end in a curved beam.
9. To make computer programs for theoretical verification of the above experiments.

Text Books:

Experimental Methods in Structural Mechanics Kukreja C B and Sastry V V

Note:

1. Ten experiments are to be performed in the Semester.

2. At least eight experiments should be performed from the above list. Remaining two experiments may either be performed from the above list or designed & set by the concerned institute as per the scope of the syllabus

CE -214B: OPEN CHANNEL FLOW LAB

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
--	--	2	1	**Class Work**	**:**	**20 Marks**
				Examination	**:**	**30 Marks**
				Total	**:**	**50 Marks**
				Duration of Examination	**:**	**3 Hours**

List of Experiments:

1. To determine Manning's co-efficient of roughness for the rough bed of a given flume.
2. To measure the velocity distribution in a rectangular channel by Prandtl Pitot tube and to determine the energy correction factors
3. To study the flow through a horizontal contraction in a rectangular open channel.
4. To calibrate a current meter
5. To study the formation of hydraulic jump in a horizontal rectangular open channel (Measurement of Froude no. and energy loss)
6. To study the flow over a hump in a channel bed.
7. To study the pressure distribution along the spillway surface for different heads.
8. To calibrate a broad-crested weir and to study the pressure distribution along its surface.
9. To calibrate a venturi flume.
10. To study the flow under a sluice gate and formation of hydraulic jump at different Froude no.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE – 216B: GEOMATICS ENGINEERING LAB

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
--	--	2	1	**Class Work**	**:**	**20 Marks**
				Examination	**:**	**30 Marks**
				Total	**:**	**50 Marks**
				Duration of Examination	**:**	**3 Hours**

List of Experiments

1. Study of Aerial photographs.
2. Study and image interpretation of remote sensing data.
3. Introduction to CAD/GIS/Image Processing software
4. Study of digital image characteristics such as:
    - DN value,
    - Histogram,
    - Color image generation,
    - Simple Image enhancement,
    - On-screen digitization from images,
    - Area computation,
    - Geo-registration of images etc.

Note: The students will perform all above mentioned experiments. However, some more experiments may be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE – 218B: ENGINEERING GEOLOGY LAB
B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
--	--	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30 Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

List of Experiments:

1. Study of minerals-hand specimens.
2. Study of rocks-hand specimens.
3. Field description of rocks for engineering practices.
4. Study of elements of symmetry and Crystal systems with crystal models.
5. Study of Geological Maps.
6. Dip and strike problems.
7. Study of optical properties of minerals.

Note: All experiments are to be performed in the Semester however some more experiments may also be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE – 220B: CONCRETE TECHNOLOGY LAB

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
--	--	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30 Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

List of Experiments:

1. To determine standard consistency, initial and final setting times of cement
2. To determine compressive strength of cement
3. To determine the specific gravity of cement
4. To determine specific gravity of fine aggregate
5. To determine the specific gravity of coarse aggregate
6. To determine the grading of fine aggregate
7. To determine the grading of coarse aggregate
8. To determine the water absorption and moisture content of fine aggregate
9. To determine the water absorption and moisture content of coarse aggregate
10. To determine the compressive, tensile and flexural strengths of concrete
11. To design a mix grade of concrete as per Indian standard IS:10262 2009

Text Books

1. Material Testing Laboratory manual Kaushik S K, Kukreja CB Gupta VK and Kishore K. Standard Publishers Distributors
2. Concrete Laboratory Manual M. L. Gambhir

Note: All experiments are to be performed in the Semester however some more experiments may also be performed as designed & set by the concerned Institution as per the scope of the syllabus.

GPCE 202B GENERAL PROFICIENCY & ETHICS

B. Tech. Semester – IV (Civil Engineering)

L	T	P	Credits	Examination	:	75Marks
1	--	--	2	Total	:	75 Marks

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him /her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance --------

II. Extra Curricular Activities / Community Service, Hostel Activities **(8 Marks)**

III Technical Activities / Industrial, Educational tour **(8 Marks)**

IV Sports/games **(14 Marks)**

V Moral values & Ethics **(15 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

C. A student will support his/her achievement and verbal & communicative skill through presentation before the committee.
(30 Marks)

C. Moral values & Ethics

Syllabus - Process for Value Education, self-evaluation concept and process.

A minor test will be conducted during the semester and It will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1	Chairperson of the Department	Chairman
2	Senior Most Faculty Counselor	Member
3	Vice- Chancellor's Nominee	Member

Affiliated Colleges:

1	Director/Principal	Chairman
2	Head of the Department/Sr. Faculty	Member
3	External Examiner to be appointed by the University	Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

CE-301B: STRUCTURAL ANALYSIS – II

B. Tech. 3nd Year (Semester – V)

L	T	P	Credits	Class Work	:	25 Marks

3	**2**	**--**	**5**	**Examination**	**:**	**75Marks**
				Total	**:**	**100 Marks**
				Duration of Examination	**:**	**3 Hours**

UNIT - I

Analysis of Indeterminate Structures: Degree of static and kinematic indeterminacies, analysis of indeterminate beams, pin jointed frames, rigid frames and trusses by method of consistent deformation, effect of lack of fitness, temperature, method of least work, induced reactions on statically indeterminate beams, pin jointed frames, rigid frames and trusses due to yielding of supports, Analysis of two hinged and fixed arches.

Fixed and Continuous Beams: Analysis of fixed beams, continuous beams and propped cantilevers by moment-area theorem and strain energy method, fixed end moments due to different types of loadings, effects of sinking and rotation of supports, bending moment and shear force diagrams for fixed beams and propped cantilevers, slope and deflection of fixed beams, analysis of continuous beams by the three moment theorom (Clapeyron's theorem) due to different types of loadings.

UNIT - II

Slope and Deflection Method: Introduction, slope-deflection equations, analysis of statically indeterminate beams and rigid frames (sway and non-sway type) due to applied loads and uneven support settlements.

Moment Distribution Method: Introduction, absolute and relative stiffness of members, stiffness and carry-over factors, distribution factors, analysis of statically indeterminate beams and rigid frames (sway and non-sway type) due to applied loads and uneven support settlements, symmetrical beams and frames with symmetrical, skew-symmetrical and general loading.

UNIT - III

Kani's Method: Introduction, basic concept, analysis of statically indeterminate beams and rigid frames (sway and non-sway type) due to applied loadings and yielding of supports, symmetrical beams and frames, general case- storey columns unequal in height and bases fixed or hinged.

Approximate Analysis of Frame: Vertical and lateral load analysis of multistory frames, portal, cantilever and substitute-frame methods and their comparison.

UNIT - IV

Space Frames: Introduction, simple space truss, types of supports, equilibrium and stability conditions, analysis of determinate and indeterminate space frames using tension coefficient method.

PLASTIC ANALYSIS: Basics of plastic analysis, static and kinematic theorems for plastic analysis of beams and frames.

REFERENCE BOOKS

1. Indeterminate Structural Analysis C K Wang Tata McGraw Hill

TEXT BOOKS :

1. Basic structural analysis - C.S. Reddy
2. Structural Analysis- Thandvamoorthy TS Oxford University Press
3. Structural Analysis - Devdas Menon Narosa Publishing House

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-303B: HYDROLOGY

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
3	**1**	**--**	**4**	**Class Work**	**:**	**25 Marks**
				Examination	**:**	**75Marks**
				Total	**:**	**100 Marks**

Duration of Examination : 3 Hours

UNIT I

Precipitation: Hydrologic cycle and Water Budget, Scope and Applications, Drainage basin and its characteristics. Precipitation - Types and Forms, Measurement by rain gauge and other methods, Design of rain gauges station, Mean precipitation, Presentation of rainfall data, Estimation of missing rainfall data. Test for consistency of record, Analysis of rainfall data, Intensity-depth-area relationship, Duration-Frequency curves, Depth-Area-Duration curves, Frequency analysis of rainfall data.

Abstractions From Precipitation: Evaporation and Transpiration, Factors affecting evaporation, Measurement by different methods. Infiltration, Factors affecting infiltration, Infiltration measurement, Infiltration capacity curve, Infiltration indices.

UNIT II

Run Off: Factors affecting run off, Estimation of run off by various methods, Rainfall-runoff co-relations. Flow Duration Curve, Mass Flow Curve.

Hydrographs: Components, Base flow separation, Derivation of Unit Hydrograph and its applications & limitations, Synthetic and Instantaneous Unit Hydrograph, S-Curve Hydrograph, Dimensionless Unit Hydrograph, CWC method for Indian Catchments.

UNIT III

Reservoir Planning: Types of reservoir, Flood Routing through reservoir, Storage zones, Selection of reservoir site, Mass curve analysis for reservoir capacity, Reservoir yield and its determination for a given reservoir capacity, Reservoir sedimentation and its control, Control of erosion in catchment areas, Watershed management and Rain water harvesting

UNIT IV

Floods: Floods, Methods of flood control, Flood Routing through channels. Estimation of flood by Envelope Curves, Emperical Formulae and Rational Method, Application of Unit Hydrograph. Flood frequency analysis, Probability plotting, Gumbel's distribution. Selection of a design return period.

Text Books

1. Engineering Hydrology by K. Subramanya, Tata McGraw-Hill Publication
2. Hydrology by H.M. Raghunath, New Age International Publishers
3. A text book of Hydrology by D.P. Jaya Rami Reddy, University Science Press

Reference Books

1. Applied Hydrology, V T Chow, D R Maidment and W L Mays, McGraw-Hill Publication
2. Hydrology, M Wanielista, R Kersten, R Eaglin, John Wiley

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 305B: REINFORCED CONCRETE DESIGN – I

B. Tech. 3nd Year (Semester – V)

L	T	P	Credits
3	2	--	5

Class Work	**:**	**25 Marks**
Examination	**:**	**75Marks**
Total	**:**	**100 Marks**
Duration of Examination	**:**	**3 Hours**

USE OF RELEVANT INDIAN STANDRAD IS ALLOWED IN THE EXAMINATIONS

UNIT I

Introduction: Reinforced concrete, definition, properties of materials, grades of concrete and reinforcing steel, stress-strain curves, permissible stresses, concrete structural systems-slabs, beams, columns and foundations, design philosophies working stress design, ultimate strength and limit state design method, Codal Provision for RC Elements: (I) General (II) for ductility.

Working Stress Design Method : Introduction, Assumptions, derivation of design constants, problems on computation of moment of resistance, determination of stresses, and design of rectangular beams reinforced in tension and compression, flanged beams and slabs.

UNIT II

Working Stress Design Method : Design for shear and bond and torsion, Permissible shear strength, maximum shear strength, shear reinforcement and design procedure for shear reinforcement, bond and development length, anchoring and curtailment of bars.

Working Stress Design Method - Design for Compression, Design of short and long columns, sections subjected to direct load and uniaxial bending.

UNIT III

Limit State Design Method : Introduction, Limit States, Characteristic values, characteristic strength, characteristic loads, design values for materials and loads, factored loads. Limit State of Collapse (Flexure) Types of failures, assumptions for analysis and design of singly reinforced, doubly reinforced sections, and flanged sections.

UNIT IV

Limit State Design Method : Limit State of Collapse (Shear, bond and torsion) Introduction - Design for shear, structural components subjected to torsion, design of rectangular beam section for torsion, development length, continuation of reinforcement (beyond cut off points). Limit State of Collapse (Compression) Columns and their classification, reinforcement in columns, assumptions, short and long (both tied and helical) columns subjected to axial load, short columns subject to axial, uniaxial and biaxial bending.

Text Books

1. Reinforced Concrete Design, M.L. Gambhir, Macmillan India Limited, New Delhi
2. Limit State Design of Reinforced Concrete, A.K. Jain, Nem Chand Brothers, Roorkee.
3. Limit State Design, Ram Chandra, Standard Book House, New Delhi

Reference Books

1. Reinforced Concrete Design, Pillai & Menon , Tata McGraw Hill Publishers, New Delhi
2. Reinforced Concrete Structures by Paulay and Thomas Park
3. Reinforced Concrete Design by Nilson and Winter
4. Reinforced Concrete Fundamentals Keith by Ferguson

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-307B: ENVIRONMENTAL ENGINEERING – I

B. Tech. 3nd Year (Semester – V)

L	T	P	Credits			
3	1	--		Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

1. **Water Sources:** Definition and Scope of Environmental Engineering, Surface and ground water sources; Selection and development of sources;
2. **Water Supply Systems:** Municipal water demands and demand variations, Population forecasting and water demand estimations; Intakes and transmission systems, pipes for transporting water and their design

UNIT -II

3. **Water Quality:** Physical, chemical and biological water quality parameters; Water quality index; Water quality standards; Classification of water bodies.
4. **Water treatment - I:** Water treatment schemes; Basic principles of water treatment; Design of plain sedimentation, coagulation and flocculation, filtration – slow, rapid and pressure; Disinfection units. Data and background information for the design of water supply system;

UNIT - III

5. **Water treatment - II:** Fundamentals of water softening, fluoridation and deflouridation, and water desalinization and demineralization.
6. **Design of Water Supply Systems**: Water supply network design and design of balancing and service reservoirs; operation and maintenance of water supply systems.

UNIT - IV

7. **Pumps and pumping stations:** Types of pumps and their characteristics and efficiencies; Pump operating curves and selection of pumps; Pumping stations.
8. **Small scale and household level water purification system and water fixtures**

Text Books

1. Manual on Water Supply and Treatment by Ministry of Urban Development, New Delhi.
2. Water Supply and Sewerage, McGhee, McGraw Hill.
3. Environmental Engineering, Vol. I, S.K. Garg, Khanna Publishers, New-Delhi.

References Books

1. Environmental Engineering Peavy, Rowe and Tchobanglous, McGraw Hill.
2. Water and Waste Water Engineering (Vol. 1&2), Fair, Geyer & Okun, John Wiley, New York.
3. Water Supply Engineering P.N. Modi, Standard Book House New-Delhi.
4. Standard Methods for the Examination of Water and Waste Water, American Public Health Association.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE- 309B: TRANSPORTATION ENGINEERING – I

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Highways development Planning: Introduction, Different modes of transport, Development of Transport System, Phased development of Roads in India. Highway Surveys & Alignment, Design, Drawings, Estimates & Project Report.

Highway materials and testing: sub grade, sub base and base course materials, bituminous materials, testing of soil, aggregate and bitumen.

UNIT - II

Geometric Design of Highways: Introduction, Highways Classification, Right of way, Land width, width of formation, width of pavement, Sight Distances, camber, horizontal and vertical Road Curves, Transition Curves.

Design of Pavements: Types of pavements, Factors affecting design of pavements, wheel load factor, Climatic Factors, Structure of Flexible pavement, Function of various components of Flexible pavement, design of flexible pavements by G.I. & CBR methods, stresses in rigid pavements, design of rigid pavements by IRC method.

UNIT - III

Traffic Studies: Road user characteristics, Importance of traffic studies, spot speed, speed and delay and origin and destination studies. Vehicular flow models. Stream variables: Spacing and concentration, headway and flow, mean speed. Time distance diagram of flow. Traffic operations and control devices, intelligent transport systems.

Road Safety Audits: Road Safety Audits: Safety concerns in highway projects, Systems approach, various stages of Safety Audit, Preparation of Audit Reports.

UNIT - IV

Highway construction: road types--earth roads, gravel roads, water bound macadam, bituminous pavement including surface treatment, premix carpet, mastic asphalt, bituminous macadam, bituminous concrete and cement concrete roads. Construction of earth, gravel and water bound macadam roads, Construction Equipments.

Maintenance: Introduction, Maintenance of Earth, gravel, WBM, GSB, WMM Roads, Bituminous Roads, Maintenance of berms, Side Slopes, Pavement edge and draining work. Failures of flexible and rigid pavements: Maintenance, evaluation and its strengthening.

Text Books

1. Highway Engineering by Khanna and Justo, Nem Chand & Brothers, Roorkee
2. Highway Engineering by L.R. Kadyali, Nem Chand & Brothers, Roorkee

Reference Books

1. Highway Engineering by Oglesby and Hews
2. Transportation Engineering by G.V. Rao, Tata McGraw Hill Publisher, New Delhi
3. Principles of Pavement Design by E.J. Yodder
4. Traffic Engineering by Matson,Smith & Hurd

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE- 311: GEO-MECHANICS

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT I

Basic Soil Properties: Introduction to soil mechanics. Soil formation, various soil types, Soil map of India, Phase relationships; Index properties, sieve & hydrometer analysis, Atterberg's limits, sensitivity, thixotropy, and plasticity charts. Indian standard and Unified classification systems of soils, Introduction to Clay minerals, their characteristics. Soil structure, granular soil fabric.

Rock Mechanics: importance, composition of rocks, classification for engg. purposes, theories of brittle failure, elastic and dynamic properties of rocks.

UNIT II

Permeability of soil: Darcy's law, validity of Darcy's Law, seepage velocity, factors affecting permeability, Laboratory and field determination of permeability. Flow net and its properties, Laplace equation, methods of drawing flownet, seepage through earth dams, exit gradient and seepage pressures, phenomenon of piping and heaving, filters. Anisotropy & average permeability of layered soils.

Effective Stress Principle: Capillarity, types of head, seepage forces, quick sand condition, and critical hydraulic gradient.

UNIT III

Compaction: compaction tests, OMC, factors affecting compaction, control of compaction, field compaction equipment and their suitability.

Compressibility and Consolidation: isotropic one and three dimensional compressions, Terzaghi's theory, time rate of consolidation, consolidation test, Compressibility & Coefficient of Consolidation, NC, OC soils, determination of pre-consolidation pressure, settlement analysis, secondary consolidation.

UNIT IV

Stresses in Soils: Boussinesq and Westergarrd's formulae, pressure bulbs, Newmark's chart. Approximate methods

Shear Strength: Mohr's circle, Failure theories, direct, tri-axial, unconfined and vane shear tests. Drainage conditions, Concept of pore pressure coefficients, shear characteristics of normally consolidated, over consolidated clays and dense and loose sands, Dilatancy, residual strength, stress path, constant volume shear.

Text Books

1. Basic and Applied Soil mechanics by Gopal Ranjan & A.S.R. Rao, New Age Publisher, New Delhi
2. A text book on Soil Mechanics and Foundation Engineering by V.N.S. Murthy, U.B.S. Publisher, New Delhi
3. Geotechnical Engg. by Parshotham Raj, Tata McGraw Hill, New Delhi.

Reference Books

1. Soil Mechanics by R. F. Craig, Chapman and Hall, U.K.
2. Principles of Soil Mechanics by B.M. Das, PWS and Kent Publisher USA.
3. Geotechnical Engg. by Venkatramaiah, New Age Publisher, New Delhi.
4. Modern Geotechnical Engineering Alam Singh

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-313B: REINFORCED CONCRETE DESIGN - I LAB

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
				Class Work	:	20 Marks

-	**-**	**2**	**1**	**Examination**	**:**	**30Marks**
				Total	**:**	**50 Marks**
				Duration of Examination	**:**	**3Hours**

Structural Drawings through AUTOCAD of the followings

2. Singly reinforced concrete beams
3. Doubly reinforced concrete beams
4. Flanged beams
5. Cracking pattern of reinforced concrete beams
6. Simply supported and cantilever slabs
7. Continuous slabs
8. Two way slabs
9. Columns

Students are required to draw full length sheets on AUTOCAD and submit minimum 8 sheets during examinations.

CE-315B: ENVIRONMENTAL ENGINEERING - I LAB

B. Tech. 3rd Year (Semester – V)

L	**T**	**P**	**Credits**			
				Class Work	**:**	**20 Marks**
-	**-**	**2**	**1**	**Examination**	**:**	**30Marks**
				Total	**:**	**50 Marks**
				Duration of Examination	**:**	**3Hours**

List of Experiments:

1) Flow measurements in closed conduits – venturimeter, orifices.
2) Determination of Color & Turbidity.
3) Determination of Solids: Total, Dissolved and Suspended; dissolved solids through conductivity.
4) Determination of Alkalinity and its species.
5) Determination of pH, and Acidity and its species.
6) Determination of Hardness (different types)
7) Determination of Chlorides.
8) Determination of Fluorides.
9) Jar test for optimum coagulant dose estimation.
10) Determination of residual chlorine and chlorine dose.
11) MPN Test.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE- 317B : TRANSPORTATION ENGINEERING-I LAB

B. Tech. 3rd Year (Semester – V)

L	**T**	**P**	**Credits**			
				Class Work	**:**	**20 Marks**
--	**--**	**2**	**1**	**Examination**	**:**	**30 Marks**
				Total	**:**	**50 Marks**
				Duration of Examination	**:**	**3 Hours**

List of Experiments:

1. Aggregate Impact Test
2. Los Angles Abrasion Test on Aggregates
3. Crushing Strength Test on Aggregates
4. Penetration Test on Bitumen.
5. Ductility test on Bitumen.
6. Water absorption and specific gravity tests.
7. Softening Point Test on Bitumen
8. Flash & fire point test.
9. Determination of speed by radar and endoscopes.
10. Study of driving skills.
11. CBR test.
12. Traffic Volume Study
13. Accident Study

Note: **Atleast ten experiments are to be performed in the Semester however some more experiments may also be performed as designed & set by the concerned Institution as per the scope of the syllabus.**

CE- 319B: GEO MECHANICS LAB

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
--	--	2	1	Class Work	:	20 Marks
				Examination	:	30 Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments:

1. Visual Soil Classification
2. Determination of water content.
3. Determination of field density by Core cutter method
4. Determination of field density by Sand replacement method
5. Grain size Analysis by Mechanical Method.
6. Grain size Analysis by Hydrometer Method.
7. Determination of Specific Gravity by Psychomotor.
8. Determination of Atterberg's limits
9. Determination of Permeability by constant head permeameter.
10. Determination of permeability by variable head permeameter.
11. Proctor's Compaction Test
12. Unconfined Compression Test.
13. Direct Shear Test.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE- 321B: Survey Camp

B. Tech. 3rd Year (Semester – V)

L	T	P	Credits			
--	--	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30 Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

Survey Camp: Civil Engineering Surveying Practical Experience is a Two-Three week course between the spring and summer semesters. Each day is about eight hours long and full of hands-on experience with surveying and map preparation. Teams of 4-6 students will work with faculty, practicing surveyors and use their equipment out in the field. The camp will provide a necessary foundation for any engineer. It will teach them how surveying is applied to engineering projects and what they need to know in order to review survey data. The students will prepare map of an area following various steps like establishment of control points, Triangulation, computations, error adjustment, plotting details on map and contouring .

The students for this course shall be evaluated in 5th semester by a Committee consisting of three teachers to be constituted by the Chairperson of the department.

Teachers associated with evaluation work will be assigned 2 periods per week load.

CE – 302 B: REINFORCED CONCRETE DESIGN II
B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
3	2	--	5	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	4 Hours

USE OF RELEVANT INDIAN STANDARD IS ALLOWED IN THE EXAMINATIONS. ONLY LIMIT STATE DEISGN METHOD IS TO BE USED IN THIS COURSE.

UNIT I

Continuous Beams and slabs: Basic assumptions, Moment of inertia, settlements, Modification of moments, maximum moments and shear, redistribution of moments for single and multi-span beams, design examples.

Flat slabs: Advantages of flat slabs, general design considerations, approximate direct design method, design of flat slabs, design examples.

UNIT II

Foundations: Isolated footings**,** Combined footings, rectangular, trapezoidal, strip, strap, raft footings

UNIT III

Design of curved beams in plan: Analysis and Design of curved beams fixed at both ends, ring beams

Design of Domes: Meridional and hoop stress in spherical and conical domes, Design

UNIT IV

Retaining walls: Design of cantilever and counter fort type retaining walls.

Water Tanks: Estimation of Wind and earthquake forces, design requirements, rectangular and cylindrical underground ,Intze tanks, design considerations, design examples..

Text Books

1. Reinforced Concrete Structures, P. C. Varghese, Tata McGraw Hill
2. Advanced Reinforced Concrete Structures, P. C. Varghese, Tata McGraw Hill
3. Reinforced Concrete Design, M.L. Gambhir, Macmillan India Ltd., New Delhi
4. Limit State Design of Reinforced Concrete, A.K. Jain, Nem Chand and Bros., Roorkee
5. Behaviour, Analysis and Design of R.C.C. Structural Elements, I.C. Syal and Ummat, A.H. Wheelers, New Delhi

Reference Books

1. IS:456 2000
2. IS 3370 2009
3. Plain and Reinforced concrete, Vol. 2, O P Jain and J. Krishna, Nem Chand and Bros., Roorkee
4. Reinforced Concrete Design, S U Pillai and D Menon, Tata McGraw Hill

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 304 B: DESIGN OF STEEL STRUCTURES I

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
3	2	--	5	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

USE OF RELEVANT INDIAN STANDARD IS ALLOWED IN THE EXAMINATIONS.

UNIT I

Introduction: Loads, structural steels and their specifications, structural elements, steel vs. concrete and timber, design approaches—elastic and limit state methods, design specifications as per IS: 800, structural layout, strength and stiffness considerations, efficiency of cross-section, safety and serviceability considerations.

Structural Fasteners and Connections: Riveting and bolting, their types, failure of riveted joint, efficiency of a joint, design of riveted joint, concentric riveted joints, advantages and disadvantages of bolted connections, stresses in bolts, types of welded joints, design of welded joint subjected to axial loads, welded joints subjected to eccentric loads, simple, semi-rigid and rigid connections.

UNIT II

Tension Members: Types of sections, net area, net effective area for angles, tees, design of tension members, tension splice, high strength steel cables.

Compression Members: Axially loaded columns, effective length, slenderness ratio, allowable stresses, general specifications, design of axially loaded members, laced and battened columns and their design, built up compression members, eccentrically loaded columns and their design, column splice and its design, encased columns.

UNIT III

Flexural Members: Design criteria, permissible stresses, laterally supported beams and their design laterally unsupported beams and their design, web buckling, web crippling, built up beams, encased beams, members subjected to bending and compression, Plate Girders**:** Introduction, weight and economic depth, design of flanges, design of web, curtailment of flange plates, intermediate and bearing stiffeners, design of a riveted and welded plate girders, web and flange splice.

Column Bases: Introduction, slab base, gusseted base, column base subjected to moment, grillage foundation.

UNIT IV

Tubular Structures: Permissible stresses, tube columns and compression members, tube tension members, tubular roof trusses, joints in tubular trusses, tubular beams and purlins

Aluminium Structures: Permissible stresses, tension members, compression members, local buckling of compression members, design of beams and connections

Text Books

1. Design of Steel Structures, Vol. 1 and Vol. II, Ram Chandara, Standard Book House.
2. Design of Steel Structures, by A.S. Arya and J.L. Ajmani. , Nem Chand Brothers, Roorkee.

Reference Books

1. Design of Steel Structures, P. Dayaratnam, Wheeler Publishing, New Delhi.
2. Design of Steel Structures, M. Raghupathi, Tata McGraw Hill, New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 306 B: FOUNDATION ENGINEERING

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

Introduction to soil exploration: scope, soil exploration for different structures, spacing, significant depth, boring and sampling techniques, types of samples, penetration test (SCP and SPT), sample disturbances and Geophysical methods.

Earth Pressure: Earth Pressures at rest condition, states of plastic equilibrium, Rankine and Coulomb's theories for active and passive conditions, Influence of surcharge, water table, wall friction, Rehbann's and Culmann's graphical methods, open cuts, Retaining Walls.

UNIT II

Stability of Slopes: Infinite slope, types of failure, total and effective stress analysis, Taylor's stability numbers, concept of factors of safety, method of slices, Swedish's circle method, friction circle method, effect of sudden draw down and submergence.

Design of Shallow Foundation: Bearing Capacity, Definitions, depth of foundation, Terzaghi's general bearing capacity equation, IS code equation, factors affecting bearing capacity. Settlements for clays and sands, permissible settlements, bearing capacity by penetration tests, plate load test. Types of Shallow Foundations, Design Criteria, Stability, Shear, and Settlement Failures, Influence of eccentric and inclined loads.

UNIT III

Pile Foundations: Types, function, selection of piles, pile driving formulae, equipment, point, bearing and friction piles. Load carrying capacity of single pile, group action, spacing of piles, Negative skin friction, Piles subjected to lateral loads, settlement of pile groups, under reamed piles. **Caissons and Wells:** Introduction, components, shapes, stability of well foundation, Terzaghi's method of analysis, sinking of well, tilts and shifts.

UNIT IV

Foundation in Difficult Grounds: Ground Improvement techniques, drainage and dewatering, Foundation in Swelling Soils, use of Soil reinforcement. **Machine Foundation:** Definition, types, problem of machine foundation, spring mass analogy, coefficient of elastic uniform compression, free and damped vibration, block foundation test, Cyclic plate load test, mathematical models, design criteria.

Text Books

1. Basic and Applied Soil Mechanics, by Gopal Ranjan Rao, ASR Rao, New Age Int. (P) Ltd. Pub., New Delhi,
2. Soils and Foundations, by Cheng Liu & Jack B Evett, Prentice-Hall Inc., USA.
3. A Text Book of Soil Mechanics Foundation Engg. by VNS Murthy – U.B.S, New Delhi.

References Books

1. Foundation Analysis and Design, by J.E. Bowles McGraw Hill Book Company, NewYork.
2. Foundation Engineering by Peck, Wiley Eastern India Limited, New Delhi.
3. Soil Mechanics & Foundation Engineering, by K.R. Arora, Standard Publishers, New Delhi.
4. Soil Dynamics and Machine Foundations by Swami Saran, Galgotia Publishers, New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 308B: STRUCTURAL ANALYSIS - III

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
3	2	--	5	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT I

Introduction: Introduction to matrix algebra, systems approach: force and displacement methods and their comparison. **Matrix Force Method**: Introduction to flexibility approach, Choice of redundant, static equilibrium matrix, deformation compatibility matrix, member flexibility matrix, static equilibrium and deformation compatibility checks. Application for trusses, continuous beams and rigid frames.

UNIT II

The matrix displacement or Stiffness Method: Conditions of stress-strain relationships, equilibrium and compatibility, Application for trusses, continuous beams and rigid frames. **Formulation of various matrices:** Static equilibrium matrix - deformation compatibility matrix, member stiffness matrix, global stiffness matrix, external load matrix, static equilibrium and deformation, compatibility checks and effects of support settlement and lack of fit. Conversion of member loads into joint loads. Partitioning of global stiffness matrix.

UNIT III

Direct Stiffness Method: Derivation of global matrix from energy considerations, transformation matrices, member stiffness matrix with respect to member coordinate system, member stiffness matrix for global coordinates and global stiffness matrix. Displacement boundary conditions, computer generation of global stiffness matrix, effect of temperature and lack of fit.

UNIT IV

Finite Element Method: Introduction and basic concepts. Energy approach and variation principles in Finite-Element Method, Various element shapes, 1-D bar element

Text Books:

2. Matrix Analysis of Framed Structures, Gere and Weaver, CBS Publishers & Distributors.
3. Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.

Reference Books:

1. Matrix method of Analysis, Martin, McGraw Hill Book Company, New York.

Structural Analysis – A Unified Approach, D.S. Prakash Rao, Tata McGraw Hill Publishing Co., New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE- 310B: TRANSPORTATION ENGINEERING - II

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT – I

Introduction: Role of railways in transportation, historical development of railways.

Permanent way and components: gauges in railway tracks, typical railway track cross-section, coning of wheels, Function of rails, requirement of rails, types of rail sections – comparison of rail types, length of rail, rail wear, rail failures, creep of rails, rail fixtures and fastenings – Fish plates, spikes, bolts, chairs, keys, bearing plates. **Sleepers**: Functions and requirements of sleepers, classification of sleepers, timber, metal and concrete sleeper, comparison of different types of sleepers, spacing of sleepers and sleeper density. **Ballast**: Function and requirements of ballast, types, comparison of ballast materials.

UNIT – II

Geometric design: Vertical and horizontal alignment, horizontal curves, super elevation, equilibrium, cant and cant deficiency, length of transition curve, gradients and grade compensation. Stations and yards, and their classification, **Points and crossings**: introduction, necessity of points and crossings, turnouts, points and crossings, design of a simple turnout.

UNIT – III

Track safety, Signaling and Interlocking: objects of signaling, engineering principle of signaling, classification, control of train movements, absolute, automatic block system, centralized control system, ATS. Interlocking: definition, necessity and function, methods of interlocking, mechanical devices for interlocking. Traction and tractive resistance, stresses in track, Equipments, Mechanized Maintenance, Track Recording & track Tolerances, Mass Rapid Transport Systems, High Speed Trains, Present & Future, modernization of railway tracks, railway systems in modern era.

Tunnels: sections of tunnels—advantages, limitations and suitability, shafts, pilot tunnels, methods of driving tunnels in rocks and soft grounds. Stress around the tunnels.

UNIT – IV

Airport Engineering: Brief history of air transport: Aircraft characteristics. Airport site selection, various surveys for site selection. Classifications of obstructions, Imaginary surfaces, Approach zone and turning zone. Runway orientation, basic runway length, corrections for elevation, temperature & gradient, airport classifications.

Airport Design: runway geometric design, airport capacity, factors controlling taxiway layout, geometric design standards for taxiway holding aprons. Terminal area, building area, parking area, apron, hanger typical airport layouts. LCN/PCN method of rigid pavement design. Trend growth of Domestic Air Traffic in India, Air Cargo.

Air traffic control aids: visual aids, marking and lighting of runway and apron area, wind and landing direction indicator

Text Books

1.Railway Engineering by Arora and Saxena, Dhanpat Rai & Sons, New Delhi
2.Airport Planning and Design by Khanna, Arora & Jain, Nem Chand & Brothres, Roorkee

Reference Books

1.Railway Engineering by Rangawala, Charotar Publishing House, Anand
2.Railway Engineering by M.M. Aggarwal
3.Airport Engineering by Harnjeff, McGraw Hill Inter. Publisher

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE- 312B: ENVIRONMENTAL ENGINEERING - II

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT -I

Sewerage system: Generation and Estimation of Community Sewage; Flow variations; Storm Water flow; Alternate systems for sewage collection and conveyance; Design of sewers;

Characterization of sewage: Parameters for characterization; Sampling, testing and analysis of sewage; Relative stability and population equivalent; BOD and BOD kinetics.

UNIT -II

Treatment of sewage: Effluents standards; Basic principles of sewage treatment; Introduction to unit operations and processes - primary treatment units such as screening, grit chamber, and Sedimentation tanks. Secondary treatment units such as different types of aerobic suspended and attached growth systems, and tertiary treatment Sludge Handling and disposal – thickening, stabilization, dewatering, drying and disposal.

UNIT -III

Sewage treatment units design: ASP, TF, stabilization ponds.

Treated effluent disposal: Disposal into surface water bodies; Reuse for irrigation and aqua-culturing; Land disposal; Disposal through injection into groundwater. Indian standards for disposal of effluent.

UNIT -IV

Low cost sanitation systems – Imhoff tanks, septic tank, stabilization ponds;; oxidation ponds; and constructed wetland systems.

Plumbing: Sewage pumping and pumping stations, Sewer connections for houses and buildings, Sewer appurtenances; Construction and Maintenance of sewers;

Text Books

1. Introduction to Environmental Engg. by M.L Davis and Corn Well , McGraw Hil
2. Introduction to Environmental Engg. & Science , G.M Masters, Prentice Hall of India
3. Environmental Engineering Vol. II S.K. Garg, Khanna Publishers New-Delhi.
4. Environmental Impact Assessment, R K Jain, John Wiley Publication
5. Introduction to Environmental Engg. by M.L Davis and Corn Well , McGraw Hill

References Books

1. Wastewater Engineering, Met Calf & Eddy, McGraw Hill.
2. Manual on sewerage and sewage treatment, Ministry of Urban Development, New Delhi
3. Water Supply and Sewerage, McGhee, McGraw Hill.
4. Environmental chemistry, Sawyer & McCarty and Parkins, McGraw Hill.
5. Standard Methods for the Examination of Water and Waste Water, American Public Health Association.
6. Risk Assessment, a Text Book of Case Studies, D A Paustenbach, John Wiley Publication.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE- 314B: REINFORCED CONCRETE DESIGN LAB - II

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
-	-	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

List of Experiments:

Students are required to prepare full structural drawing sheets on AUTOCAD & on the following topics

1. Isolated footings
2. Combined footings
3. Beams Curved in Plan
4. Cantilever Retaining Walls
5. Counterfort Retaining walls
6. Conical and Spherical Domes
7. Underground and Surface Water Tanks
8. Over Head Service Reserviors

Students are required to appear in the examinations with at least 10 drawing sheets with all structural details

CE- 316B FOUNDATION ENGINEERING LAB

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
-	-	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

List of Experiments:

1. Determination of Relative density of coarse grained soils in dry and saturated conditions.
2. Determination of shear strength at different densities by Direct shear test.
3. Determination of MDD and OMC at different compactive effort by compaction test.
4. Determination of Unconfined compressive strength at different compactive effort.
5. Determination of compressibility characteristics of fine grained soils by Consolidation test.
6. Determination of bearing capacity by Standard Penetration test.
7. Determination of shear strength of dry sands by Tri-axial shear test.
8. Determination of shear strength of saturated sands by Tri-axial test.
9. Determination of bearing capacity by Plate load test.
10. Determination of bearing capacity by Cone Penetration test.
11. Determination of bearing capacity by Pressuremeter test.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE- 318B ENVIRONMENTAL ENGINEERING II LAB

B. Tech. 3rd Year (Semester – VI)

L	T	P	Credits			
-	-	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

List of Experiments:

1. Flow measurement in open channels using V and rectangular notches
2. Determination of DO.
3. Determination of BOD.
4. Determination of COD.
5. Determination of Sulphates.
6. Determination of Nitrite and Nitrate nitrogen.
7. Determination of Ammonical and Total Kjeldhal Nitrogen.
8. Determination of phosphorus (total and available).
9. Determination of SVI (including MLSS and MLVSS estimations).
10. Settling column test for primary settling tank design.
11. Settling column test for secondary setting tank design

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

HUM- 302 B REPORT WRITING SKILLS

B. Tech. Semester – VI (Common for all branches)

L	T	P	Credit			
1	-	--	1	Class Work	:	25 Marks
				Examination	:	50 Marks
				Total	:	75 Marks
				Duration of Examination	:	2 Hours

OBJECTIVE

The course aims at developing competence for report writing with a focus on its complex writing techniques and procedures.

COURSE CONTENT

UNIT I

Report Writing

Reports: meaning, their importance and types, Structure of reports, Formats of reports, Use of illustrations

UNIT II

Writing of Business and Technical Reports:

Preliminary steps and procedure of writing report, writing various types of reports on technical, business related topics

RECOMMENDED READING

1. Borowick, Jerome. N. *Technical Communication and its Applications*. New Delhi: PHI, 2000
2. Guffey, Mary Ellen. *Business Communication: Process & Product*. USA: South western College Publishing, 2000.
3. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

SCHEME OF END SEMESTER EXAMINATION (MAJOR TEST) AND INSTRUCTIONS FOR THE EXAMINER

1. The duration of the exam will be 2 hours.
2. The Question Paper for this theory course shall have three questions in all covering both the units. All will be compulsory with internal choice.
3. Question no. 1 will be of 10 marks. The question may have two/three parts with enough internal choice, covering various components of both the Units.
4. Question no 2 with internal choice will be of 10 marks covering contents of the Unit I. It will be theoretical in nature.
5. Question no 3 will have two parts of 15 marks each. The student will be asked to write reports on business and technical subject/ issue covering contents of Unit II. The emphasis would be on testing the actual report writing on a given business and technical situation/ subject in letter format.

HUM- 304 B ORAL PRESENTATION SKILLS

B. Tech. Semester – VI (Common for all branches)

L	T	P	Credits			
--	--	2	1	**Class Work**	:	**20 Marks**
				Examination	:	**30 Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**2 Hours**

OBJECTIVE

To enable students to develop their speaking skills with professional proficiency

COURSE CONTENT

Oral Presentations:

Group Discussion; Mock interviews

Note for the Teacher:

The teacher concerned, by devising her/his method, must preview and review the student's spoken proficiency at the beginning and end of the semester respectively to find the efficacy of the course and degree of improvement in the student.

RECOMMENDED READING

1. Konar, Nira. *English Language Laboratories: A Comprehensive Manual*. Delhi: PHI, 2011
2. Kumar, Sanjay and Pushp Lata. *Communication Skills*. Delhi: OUP, 2011

SCHEME OF END SEMESTER EXAMINATION (Practical)

An external Practical exam of 30 marks of 2 hour duration for the course will be conducted by an external examiner appointed by the competent authority of the University's.

NOTE: **Students will be tested for their oral communication competence making them participate in Group discussion, mock situations for interview. Students may also be evaluated through a viva conducted by an external examiner.**

GPCE 302B GENERAL PROFICIENCY & ETHICS

B. Tech. Semester – VI (Civil Engineering)

L	T	P	Credits	Examination	:	75Marks
1	--	--	2	Total	:	75 Marks

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

A Faculty Counselor will be attached to a group of students which will remain associated with him /her during the entire period of the degree program in the University. Each faculty member will serve as a faculty counselor. They will act like a local guardian for the students associated with him / her and will help them in terms of career guidance, personal difficulties.

B. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance -------

II. Extra Curricular Activities / Community Service, Hostel Activities **(8 Marks)**

III Technical Activities / Industrial, Educational tour **(8 Marks)**

IV Sports/games **(14 Marks)**

V Moral values & Ethics **(15 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

D. A student will support his/her achievement and verbal & communicative skill through presentation before the committee. **(30 Marks)**

C. Moral values & Ethics

Syllabus - A few topics from the below mentioned books

1. R.R.Gaur, R. Sangal and G.P. Bagaria, " Bagaria, " A foundation course in Human Values and Professional Ethics", Pub: Excel Books, New Delhi-110028.
2. M. Govindrajan, S Natrajan & V.S. Senthil Kumar, " Engineering Ethics (including Human Values)" Eastern Economy Edition, Prentics Hall of India Ltd.

A minor test/Quiz will be conducted during the semester end. It will be the duty of the concerned teacher assigned to teach Moral values & Ethics to submit the awards to respective chairman of the department / Director/Principal.

The evaluation of this course will be made by the following Committee.

University Departments:

1	Chairperson of the Department	Chairman
2	Senior Most Faculty Counselor	Member
3	Vice- Chancellor's Nominee	Member

Affiliated Colleges:

1	Director/Principal	Chairman
2	Head of the Department/Sr. Faculty	Member
3	External Examiner to be appointed by the University	Member

Note: Remuneration will be paid to the external examiner only (at par with the other practical examinations).

CE- 401B PROJECT PLANNING AND MANAGEMENT

B. Tech. 4TH Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

Introduction: Definitions, Functions, characteristics of project, planning and principles of Planning and Management. Bar milestone charts.

Network Techniques (PERT): Planning and scheduling of PERT, Probability concepts, Allocation of resources and resource leveling, Updating, controlling and monitoring.

UNIT II

Network Techniques (CPM): Planning and scheduling of CPM, Time cost optimization, Allocation of resources and resource leveling, Updating, controlling and monitoring.

Material Management: Importance, scope, objectives and functions, identification of source and vendor analysis, purchase procedure, inventory control, EOQ analysis, ABC Analysis, layout and storage of stores, safety in handling and precautionary measures, wastage and analysis of wastages.

UNIT III

Construction Equipments: Importance, need, functions and principles, types of equipment and their uses, selection planning and matching of construction plant and equipment.

Financial Management: Concept of cost, profit, price, budgeting, cash flow, cost control methods, sources of funds, balance sheet, profit and loss statement. Valuation and, its types, Determination of value of a property, Calculation of standard rent.

UNIT IV

Account Procedure of PWD Works: Classification of Works, Master Roll, and Deposit works. Cash Book, Imprest, temporary Advance, MAS Account, Stores, Indent, Tools and Plants.

Safety in Construction: Hazards in construction projects, causes of accidents, classification and costs of accidents, measurement of losses, protective equipments, general safety programme for construction.

Text Books

1. PERT and CPM Principle and application by L.S. Srinath.
2. Project Planning and Control with PERT and CPM by B.C. Punima and Khandelwal, Laxmi Publication New Delhi.

Reference Books

1. Construction Engineering and management by S.Seetharaman, Umesh Publication Delhi.
2. Construction Project Management by Chitakara, Tata McGraw hill Publication , New Delhi
3. Construction Management & Planning by B. Sengupta and Guha, Tata Mcgraw hill Publication New Delhi

4.Construction Planning, Equipment and Methods by Robert L. Peurifoy Tata Mcgraw Hill Publication New Delhi

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE- 403B DESIGN OF STEEL STRUCTURES II

B. Tech. 4TH Year (Semester – VII)

L	T	P	Credits			
3	2	--	5	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	4 Hours

USE OF RELEVANT INDIAN STANDARD IS ALLOWED IN THE EXAMINATIONS.

UNIT I

Elementary Plastic Analysis and Design: Introduction, Scope of plastic analysis, ultimate load carrying capacity of tension members and compression members, flexural members, shape factor, mechanisms, plastic collapse, plastic analysis and design of simple portal frames.

UNIT II

Design of Steel Stacks: Introduction, various loads to be considered for the design of steel stacks, design of steel stacks including foundation.

Cold formed Sections: Introduction and brief description of various types of cold formed sections

UNIT III

Towers: Transmission line towers, microwave towers, Design loads, classification, design procedure and specification

Water Tank: Analysis and Design of Water Tank

UNIT IV

Industrial Buildings: Loads, general arrangement and stability, design considerations, design of purlins, design of roof trusses, industrial building frames, bracings.

Text Books

1. Design of Steel Structures, A.S. Arya and J.L. Ajmani , Nem Chand Brothers, Roorkee
2. Design of Steel Structures, Ram Chandra, Vol. I & II, Standard Book House
3. Design of Steel Structures, P. Dayaratnam, Wheeler Publishing, New Delhi.

Reference Books

1. BIS Codes IS 800:2007, IS 801:1975, IS 875
2. Design of Steel Structures, Gaylord and Gaylord, Mcgraw hill Publication, Newyork

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE- 405 B IRRIGATION ENGINEERING I

B. Tech. 4TH Year (Semester – VII)

L	T	P	Credits			
3	-	--	3	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit I

Introduction: Irrigation-necessity, advantages, disadvantages, development of irrigation in India, crops and crop seasons.

Soil-water relationship and irrigation methods: Soil-water relationship, root zone soil water, infiltration, conmsumptive use, field capacity, wilting point, available moisture in soil, Gross Command Area, Culturable Command Area, intensity of irrigation, delta, base period, Kor depth, core period, frequency of irrigation, duty of water, relation between delta, duty and base period, irrigation requirement, **Methods of Irrigation-**flooding methods, border strip method, check basin and furrow method, assessment of irrigation water, sprinkler irrigation, favourable conditions, sprinkler systems, planning, design and maintenance of sprinkler systems, drip irrigation-components parts..

Unit II

Canal irrigation: Component of canal distribution system, alignment of channels, losses in irrigation channels, design discharge, silt theories and design of alluvial channels, comparison of Kennedy's and Lacey's theories, canal section and design procedure, Garrets and Lacey's diagrams.

Canal outlets: Classification, requirements of a good outlet, design of pipe, APM and open flume outlet, flexibility proportionality, setting and sensitivity of outlet.

Unit III

Water logging and land reclamation: Water logging-effects, causes and measures of prevention, lining of irrigation channels, types of lining, design of lined channel land drainage, open drains, design considerations, advantages of tile drains, depth of tiledrains, layout of closed drains, discharge and spacing of closed drains, diameter of tile drain, outlets for tile drains, maintenance of tile drains, purpose of land reclamation and methods of land reclamation.

River Training: Objectives of river training, Classification of rivers, Stages of rivers, meandering of rivers, and classification of river training works, marginal embankments, guidebanks, spurs, cutoffs, bank pitching and launching apron

Unit IV

Well Irrigation: Role of Ground Water in hydrological cycle, Distribution of Ground Water, Types of aquifers, Aquifers parameters, Well Hydraulics: Darcy's law, Types of aquifers, Steady flow towards fully penetrating confined and unconfined aquifiers, Equation of motion and its applications to ground water flow problems, Determination of aquifer constant in various types of aquifers, Types of tube wells, Methods of construction, Well development.

Text Books

1. Irrigation, Water Resources and Water Power Engg. by P.N.Modi.
2. Fundamentals on Irrigation Engg. by Bharat Singh

Reference Books

1. Irrigation Engg & Hydraulic Structures by S.K.Garg.
2. Irrigation Engg. by S.K.Sharma.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 407 B ESTIMATING AND COSTING

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

Estimate: Principles of estimation, units, items of work, different kinds of estimates, different methods of estimation, estimation of materials in single room building, two roomed building with different sections of walls, foundation.

Estimate of **F**loors and roofs, R.B. and R.C.C. works, Plastering, White-washing, Distempering and painting, doors and windows, lump sum items, Estimates of canals, roads etc.

UNIT II

Specification of Works: Necessity of specifications, types of specifications, general specifications, specification for bricks, cement, sand, water, lime, reinforcement;

Detailed specifications for Earthwork, Cement, concrete, brick work, floorings, D.P. C., R.C.C., cement plastering, white and color washing, distempering, painting.

UNIT III

Rate Analysis: Purpose, importance and requirements of rate analysis, units of measurement, preparation of rate analysis, procedure of rate analysis for items:- Earthwork, concrete works, R C. C. works, reinforced brick work, plastering, painting, finishing(white-washing, distempering**).**

Contracts and Tenders: Contract, guidelines, types of contracts, their advantages and disadvantages, Tenders: Tender and acceptance of tender, Earnest money, security money, retention money.

UNIT IV

Public Works account: Introduction, function of Public Works department, measurement book, cash book, preparation, examination and payment of bills, first and final bills, administrative sanction, technical sanction. Dispute Resolution and Arbitration.

Preparation of Feasibility Report and DPR

Text Books:

1. A Text book on Estimating and Costing and Accounts by D.D. Kohli, S. Chand & Company, ND.
2. Construction Planning, Equipment and Methods by Robert L. Peurifoy Tata Mcgraw Hill Publication New Delhi
3. "Estimating and Costing", B N Dutta, S Dutta & Co., 2000.

Reference Books:

1. Indian Practical Civil Engg. Handbook, P N Khanna, Engineers Publishers, 2000

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 409 B IRRIGATION ENGINEERING LAB I

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
-	-	2	1	Class Work	:	20Marks
				Examination	:	30Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments:

1. Design of canal in alluvium by Kennedy's & Lacey's methods
2. Cross section of canals in cutting, filling, partly in cutting and partly in filling.
3. Design of Wells in confined aquifers.
4. Design of Wells in unconfined aquifers.
5. Drawing of different types of outlets
6. Design of Guide banks.
7. Design and layout of Drip irrigation system
8. Design and layout of Sprinkler irrigation system
9. Spacing of tile drain and open drains for a given site condition

Note: It is must that a student appears in examination with at least 7 complete experiments from the above list.

CE 411B PROJECT

B. Tech. Semester – VII (Civil Engineering)

L	T	P	Credits			
--	--	4	4	Class Work	:	100 Marks

The primary objective of this course is to develop in students the professional quality of synthesis employing technical knowledge obtained in the field of Engineering & Technology through a project work involving design, analysis augmented with creativity, innovation and ingenuity.

Project involving design/ fabrication/ testing/ computer simulation/ case studies etc. which commences in the VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

Chairman of Department	: Chairperson
Project coordinator	: Member Secretary
Respective project supervisor	: Member

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

CE 413 B COLLOQUIUM

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
-	-	2	2	Class Work	:	50Marks
				Total	:	50 Marks

The objectives of the course remains

- To learn how to carry out literature search
- To learn the art of technical report writing
- To learn the art of verbal communication with the help of modern presentation techniques

A student will select a topic in emerging areas of Engineering & Technology and will carry out the task under the observation of a teacher assigned by the department.

He/ She will give a seminar talk on the same before a committee constituted by the chairperson the department. The committee should comprise of three faculty members from different specializations. The teacher associated in the committee will be assigned 2 hours teaching load per week.

However, guiding students' colloquium will not be considered towards teaching load.

The format of the cover page and the organization of the body of the seminar report for all the undergraduate programs will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

CE415 PROFESSIONAL TRAINING

B. Tech. Semester – VII (Civil Engineering)

L	T	P	Credits			
--	--	2	2	Class Work	:	50 Marks
				Total	:	50 Marks

At the end of 6th semester each student would undergo four weeks Professional Training in an Industry/ Institute/ Professional Organization/ Research Laboratory etc. with the prior approval of the Training and Placement Officer of the University and submit in the department a typed report along with a certificate from the organization.

The typed report should be in a prescribed format.

The report will be evaluated in the V Semester by a Committee consisting of three teachers from different specialization to be constituted by the Chairperson of the department. The basis of evaluation will primarily be the knowledge and exposure of the student towards different processes and the functioning of the organization.

The student will interact with the committee through presentation to demonstrate his/her learning.

Teachers associated with evaluation work will be assigned 2 periods per week load.

MEI 623B ENTREPRENEURSHIP

B. Tech. Semester – VII (Civil Engineering)- Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT-I

ENTREPRENEURIAL DEVELOPMENT PERSPECTIVE: Concepts of Entrepreneurship Development, Evolution of the concept of Entrepreneur, Entrepreneur Vs. Intrapreneur, Entrepreneur Vs. Entrepreneurship, Entrepreneur Vs.Manager, Attributes and Characteristics of a successful Entrepreneur, Role of Entrepreneur in Indian economy and developing economies with reference to Self-Employment Development, Entrepreneurial Culture

UNIT II

CREATING ENTREPRENEURIAL VENTURE: Business Planning Process, Environmental Analysis - Search and Scanning, Identifying problems and opportunities, Defining Business Idea, Basic Government Procedures to becomplied with.

UNIT III

ENTREPRENEURSHIP DEVELOPMENT AND GOVERNMENT: Role of Central Government and State Government in promoting Entrepreneurship - Introduction to various incentives, subsidies and grants - Export Oriented Units - Fiscal and Tax concessions available; Role of Central/State agencies in the Entrepreneurship Development - District Industries Centers (DIC), Small Industries Service Institute (SISI), Entrepreneurship Development Institute of India (EDII), National Institute of Entrepreneurship & Small Business Development (NIESBUD), National Entrepreneurship Development Board (NEDB).

UNIT IV

PROJECT MANAGEMENT AND CASE STUDIES

Technical, Financial, Marketing, Personnel and Management Feasibility, Estimating and Financing funds requirement - Schemes offered by various commercial banks and financial institutions like IDBI, ICICI, SIDBI, SFCs, Venture Capital Funding, Why do Entrepreneurs fail - The Four Entrepreneurial Pitfalls (Peter Drucker), Case studies of Successful Entrepreneurial Ventures, Failed Entrepreneurial Ventures and Turnaround Ventures.

Texts and References:

1. Entrepreneurship: New Venture Creation - David H. Holt.
2. Entrepreneurship - Hisrich Peters.
3. The Culture of Entrepreneurship - Brigitte Berger.
4. Project Management - K. Nagarajan.
5. Dynamics of Entrepreneurship Development - Vasant Desai.
6. Entrepreneurship Development - Dr. P.C.Shejwalkar.
7. Thought Leaders - Shrinivas Pandit.
8. Entrepreneurship, 3rd Ed. - Steven Brandt.
9. Business Gurus Speak - S.N.Char.
10. The Entrepreneurial Connection - Gurmit Narula.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

BME 451B MEDICAL INSTRUMENTATIONS

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT-I

PHYSIOLOGY AND TRANSDUCERS: Cell and its structure – Action and resting – Potential propagation of action potential – Sodium pump – Nervous system – CNS – PNS – Nerve cell – Synapse – Cardio pulmonary system – Physiology of heart and lungs – Circulation and respiration – Transducers – Different types – Piezo-electric, ultrasonic, resistive, capacitive, inductive transducers – Selection criteria.

UNIT-II

ELECTRO – PHYSIOLOGICAL AND NON-ELECTRICAL PARAMETER MEASUREMENTS: Basic components of a biomedical system – Electrodes – Micro, needle and surface electrodes – Amplifiers – Preamplifiers, differential amplifiers, chopper amplifiers – Isolation amplifier. ECG – EEG – EMG – ERG – Lead systems and recording methods – Typical waveforms. Measurement of blood pressure – Cardiac output – Cardiac rate – Heart sound – Respiratory rate – Gas volume – Flow rate of CO_2, O_2 in exhaust air - PH of blood, ESR, GSR measurements – Plethysmography.

UNIT-III

MEDICAL IMAGING AND PATIENT MONITORING SYSTEMS: X-ray machine - Radio graphic and fluoroscopic techniques – Computer tomography – MRI – Ultrasonography – Endoscopy – Thermography – Different types of biotelemetry systems and patient monitoring – Electrical safety. Biological effects of X-rays and precautions.

UNIT-IV

ASSISTING AND THERAPEUTIC EQUIPMENTS: Pacemakers – Defibrillators – Ventilators – Nerve and muscle stimulators – Diathermy – Heart – Lung machine – Audio meters – Dialyzers. Respiratory Instrumentation - Mechanism of respiration, Spirometry, Pnemuotachograph Ventilators.

TEXT BOOKS

1. Biomedical Instrumentation and Measurements – Leslie Cromwell and F.J. Weibell, E.A. Pfeiffer, PHI, 2nd Ed, 1980.
2. Medical Instrumentation, Application and Design – John G. Webster, John Wiley, 3rd Ed., 1998.

REFERENCE BOOKS

1. Principles of Applied Biomedical Instrumentation – L.A.Geoddes and L.E. Baker, John Wiley, 1975.
2. Hand-book of Biomedical Instrumentation – R.S. Khandpur, TMH, 2nd Ed., 2003.
3. Biomedical Telemetry – Mackay, Stuart R., John Wiley,

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

ECE 305B CONSUMER ELECTRONICS

B. Tech. Semester – VII– Civil Engineering Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

MONOCHROME TV (INTRODUCTION): Elements of a TV System,Picture transmission,Sound transmission,Picture reception,Sound reception,Synchronization,Receiver control,Image continuity, Scanning Process, Aspect Ratio, Flicker, Composite Video Signal, Picture Elements,Kell factor, Vertical Resolution,Horizontal Resolution,Video bandwidth,Interlacing, 625 Line System,Bandwidths for TV Transmission,Vertical and horizontal synch detail,Vestigial Side Band transmission(Advantages and Disadvantages)

MONOCHROME TV (PICTURE AND CAMERA TUBES): Monochrome picture tube,beam reflection,Beam focussing,Screen Phosphor,Face plate,Picture tube characteristics,picture tube circuit controls,Monochrome Camera Tubes:Basic principle,Image Orthicon, Vidicon,Plumbicon

UNIT II

COLOUR TV ESSENTIALS: Compatibility , Colour perception,Three Colour theory,Luminance,Hue and Saturation, Dispersion and Recombination of light,Primary and secondary colours,luminance signal,Chrominance Signal, Colour picture tube,colour TV Camera,Colout TV display Tubes,colour Signal Transmission,Bandwidth for colour signal transmission,Colour TV controls. Cable TV,Block Diagram and principle of working of cable TV.

PLASMA AND LCD: Introduction,liquid crystals,types of LCD's,TN,STN,TFT,Power requirements,LCD working,Principle of operation of TN display,Construction of TN display,Behaviour of TN liquid crystals,Viewing angle,colour balance, colour TN display, limitatons, advantages, disadvantages, applications.

UNIT III

LED AND DMD : Introduction to LED Television , comparison with LCD and Plasma TV's, schematic of DMD, introduction to Digital MicroMirror device, Diagram of DMD, principle of working, emerging applications of DMD.

MICROWAVE OVENS AND AIR CONDITIONERS: Microwaves, Transit Time, Magnetron, Waveguides, Microwave Oven, Microwave Cooking. Air conditioning,Components of air conditioning systems,all water Air conditioning systems,all air air conditioning Systems,Split air conditioner.

UNIT IV

MICROPHONES: Introduction, characteristics of microphones,types of microphone:carbon,moving coil,wireless,crystal,introduction to tape recorder.

LOUDSPEAKER: Introduction to ideal and basic loudspeaker,loudspeaker construction types of loudspeaker: Dynamic and permanent magnet,woofers,tweeters,brief introduction to baffles,equalisers.

Text Books :

1.Consumer Electronics by S. P. Bali(Pearson Education)
2.Complete Satellite and Cable T.V by R.R Gulati(New Age International Publishers)

Reference Books:

1. Monochrome and Colour Television by R. R. Gulati

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

EE 451B ENERGY AUDIT

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

INTRODUCTION TO THE POWER DISTRIBUTION SYSTEM: Description of the power distribution system- voltage levels, Components of the distribution system- Substation, Transformer, feeders, distribution system planning, operation & maintenance objectives, activities involved in O&M, grid management, load scheduling & dispatch, load balancing, 66-33/11 KV substation equipment, 11/0.4 KV substation equipment, Distribution transformers- reasons for DT failures.

UNIT II

ENERGY ACCOUNTING & ENERGY AUDIT: Need for energy accounting, objectives & functions of energy accounting, Energy flow diagram in power distribution system, energy accounting procedure- Energy measurement, and problemsin energy accounting & overcoming these problems in energy accounting, Definition, need and types of energy audit, energy audit instruments,procedure for conducting an energy audit.

UNIT III

AT&C LOSS REDUCTION & EFFICIENCY IMPROVEMENT: Concepts and principles of distribution losses- transmission & distribution losses, AT&C losses in power distribution network, factors contributing to high technical & commercial losses. Technical loss reduction- Short term measures for technical loss reduction, long term plans for technical loss reduction, Commercial loss reduction- reasons for commercial losses, measures for commercial loss reduction.

UNIT IV

DEMAND SIDE MANAGEMENT: An introduction, Why DSM?, Benefits of DSM, DSM in power systems: load management, DSM techniques and emerging trends, EC Act 2001, DSM on consumer side – the industrial sector, the agricultural sector, the domestic & commercial sectors, ESCO-a route for DSM.

TEXT BOOKS:

1. Handbook of Energy Engineering, The Fairmont Press, INC.-Albert Thumann& Paul Mehta.
2. Energy Management Supply & Conservation, Butterworth Heinemann, 2002-dr. Clive Beggs.

REFERENCE BOOKS:

1. Hand book on energy audit & environment management by ISBN 81-1993.0920 TERI

Note:

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2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

EEE457B ENERGY RESOURCES & TECHNOLOGY

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT-I

ENERGY SOURCES & AVAILABILITY: World energy situation. Indian energy scenario. Comparative study of thermal, hydro, nuclear and gas power plants. Impact of thermal, gas, hydro and nuclear power stations on environment, air and water pollution, green house effect (global warning), Plasma confinement - magnetic confinement and inertial confinement, geothermal, hydrogen energy, fuel cells, Alkaline fuel cells (AFC), Solid oxide fuel cell (SOFC), Molten carbonate fuel cells (MCFC), thermo-electric power, MHD power generation OTEC & tidal waves.

UNIT-II

SOLAR ENERGY: Solar constant, solar radiation geometry, local solar time, day length, solar radiation measurement, radiation on inclined surface, solar radiation data & solar charts. Flat plate collectors , liquid and air type. Theory of flat plate collectors, advanced collectors, optical design of concentrators, selective coatings, solar water heating, solar dryers, solar stills, solar cooling and refrigeration. Thermal storage. Conversion of heat into mechanical energy. Active and passive heating of buildings. Solar cells.

UNIT-III

WIND ENERGY: Wind as a Source of Energy, Characteristics of wind, wind data. Horizontal & Vertical axis wind Mills, Wind Energy: Wind energy potential measurement, general theories of wind machines, basic laws and concepts of aerodynamics, wind mill and wind electric generator. Basic electric generation schemes- constant speed constant frequency, variable speed constant frequency and variable speed variable frequency schemes. Applications of wind energy.

UNIT-IV

BIOMASS ENERGY: Introduction to biomass, biofuels & their heat content, biomass conversion technologies. Aerobic & anaerobic digester, Factors affection biogestion, biogas plants - types & description. Utilisation of biogas - Gasifiers, direct thermal application of Gasifiers. Advantages & problems in development of Gasifiers, use in I.C. engines , Energy plantation. Pyrolysis scheme. Alternative liquid fuels –ethanol and methanol. Ethanol production.

TEXT BOOKS:

1. Electric Power Generation, B.R.Gupta
2. Power Generation, Operation and Control, Wood and Wollenberg, John Wiley & Sons,1984.
3. Power Plant Engg: G.D. Rai

REFERENCE BOOKS:

1. Renewable Energy Resources: John Twidell and Tony Weir
2. Renewable Energy Resources Conventional & Non- Conventional: M.V.R Koteswara Rao
3. Science & Technology of Photovoltaics: Jayarama Reddy P.

Note:

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BT401B: BIOINFORMATICS

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits
3	1	-	4

Class Work Marks : 25
Exam Marks : 75
Total Marks : 100
Duration of Exam : 3 Hrs.

UNIT-I

Introduction: Internet, intranet and extranet, networking, protocols, genomic data, organization, representation, data base management systems.

Sequencing Data Bank: Introduction, collecting and storing sequence in laboratory, nucleic acid data bank – Gen Bank, EMBL, AIDS and RNA, protein data bank (PDB), cambridge structural database CSD, genome data bank, hybridoma data bank structure and others.

UNIT-II

Sequence Analysis: Analysis tools for sequence data banks, pair wise alignment: NEEDLEMAN and WUNSCH algorithms, Smith Waterman, multiple alignment – CLUSTAL-W, BLAST, FASTA, sequence patterns and motifs and profiles.

Predictions: Secondary and tertiary structure: algorithms Chao-Fasman algorithm, hidden Markov model, neural networking, protein classification, fold libraries, fold recognition (threading), homology detection, SRS-access to biological data banks.

UNIT-III

Phylogenetic Analysis– Basic concepts in systematics, taxonomy and phylogeny, phylogenetic trees- various types and their construction, tree building methods, distance methods, multiple alignment character based method, phylogenetic software.

Managing Scientific Data: Introduction, challenges faced in integration of biological information, SRS, Kleisli Query System TAMBIS, P/FDM mediator for a bioinformatics database, federation, discovery link and data management.

UNIT-IV

Genomics & Proteomics: Genome mapping, assembly and comparison, functional genomics: sequence based approaches & microarray based approaches, proteomics: technology of protein expression analylsis & posttranslational modifications, protein sorting, protein-protein interaction.

TEXT / REFERENCE BOOKS:

- Developing Bioinformatics Computer Skill, ed. Gibes & Jombeck, Shroff Publication
- Bioinformatics, ed. David W. Mount

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
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AE 417B MODERN VEHICLE TECHNOLOGY

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

TRENDS IN POWER PLANTS: Hybrid vehicles – stratified charged / lean burn engines – Hydrogen engines – battery vehicles – Electric propulsion with cables – magnetic track vehicles.

UNIT II

SUSPENSION BRAKES AND SAFETY: Air suspension – Closed loop suspension – antiskid braking system, Retarders, Regenerative braking safety cage – air bags – crash resistance – passenger comfort

UNIT III

NOISE & POLLUTION: Reduction of noise – Internal & external pollution control through alternate fuels / power plants – Catalytic converters and filters for particulate emission.

UNIT IV

VEHICLE OPERATION AND CONTROL: Computer control for pollution and noise control and for fuel economy – Transducers and actuators – Information technology for receiving proper information and operation of the vehicle like optimum speed and direction.

VEHICLE AUTOMATED TRACKS: Preparation and maintenance of proper road network – National highway network with automated roads and vehicles – Satellite control of vehicle operation for safe and fast travel.

TEXT BOOKS

1. Heinz Heisler, "Advanced Vehicle Technology" - Arnold Publication.

REFERENCES

1. Beranek.L.L., Noise reduction, McGraw Hill Book Co., Inc., Newyork, 1993.
2. Bosch Hand Book, 3rd Edition, SAE, 1993.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
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CE451B POLLUTION & CONTROL

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT – I

WATER POLLUTION – Classification of water pollutants, water characteristics, effluent standards, primary treatment, secondary treatment – aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

UNIT – II

AIR POLLUTION: Classification of air pollutants, Particulates: Physical characteristics, mode of formation, setting properties, Control measures.

HYDROCARBONS: Nature; sources, control, Carbon Monoxide: Source, harmful effects on human health, control measures. Oxides of Sulphur and Nitrogen Sources, effects on human health and plants. Control measure.

UNIT – III

SOLID WASTE: Types, sources and properties of solid waste, methods of solid waste treatment and disposal

SOLID WASTE MANAGEMENT – Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

UNIT – IV

Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control. Trace element: Mechanism of distribution, essential and non essential elements, trace of element in marin environment, its ecological effects and biological effects.

Suggested Books:

1. Environmental Engg.: by Howard s. Peavy & Others, MGH International.
2. Metacaf – EDDY – Waste-water engineering revised by George Teholonobus (TMH)
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K.DE, Wiley Eastern.
5. Air Pollution: H.C. Perking – Mc Graw Hill.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CSE 411B MANAGEMENT INFORMATION SYSTEM

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
4	-	--	4	Class Work	:	25 Marks
				Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

FOUNDATIONS:-

INFORMATION SYSTEM: Introduction to Information System and MIS, Decision support and decision making systems, systems approach, the systems view of business, Managing the digital firm, Electronic Commerce and Electronic business, DBMS, RDBMS , introduction to Telecommunication and Networks

I.T.INFRASTRUCTURE:- Managing Hardware Assets, Managing Software Assets, Managing Data Resources. Internet And New It Infrastructure .

UNIT II

CONCEPTUAL SYSTEM DESIGN: Define the problems, set systems objective, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one document the system concept, and prepare the conceptual design report. Information Systems Security and Control, Ethical and Social Impact of Information Systems.

UNIT III

DETAILED SYSTEM DESIGN: Inform and involve the organization, aim of detailed design, project management of MIS detailed design , identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inform and involve the organization again, inputs outputs and processing, early system testing, software, hardware and tools propose an organization to operate the system, documentation of detailed design

UNIT IV

IMPLEMENTATION, EVALUATION AND MAINTENANCE OF THE MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files test the system, cut-over, document the system, evaluate the MIS control and maintain the system. Pitfalls in MIS development, Redesigning the organization with Information systems, Managing Knowledge Work.

TEXT BOOKS:

1.Management Information System by W. S. Jawadekar, 2002, Tata McGraw Hill.
2.Management Information System by K.C. Laudon & J.P. Laudon 7th Edition 2003 Pearson Education Publishers Indian Reprint.
3.Information System for Modern Management (3rd edition)- Robert G. Murdick, Loel E. Ross & James R. Claggett. PHI

REFERENCE BOOKS:

1.Management Information System; O Brian; TMH
2.Management Information System by Davis Olson Mac Graw Hill
3.Management Information System by Stallings,(Maxwell Mc Millman Publishers)

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
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CSE 451B CYBER SECURITY

B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
4	-	--	4	**Class Work**	:	**25 Marks**
				Examination	:	**75 Marks**
				Total	:	**100 Marks**
				Duration of Examination	:	**3 Hours**

UNIT I

INTRODUCTION TO CYBERCRIME: Cybercrime and Information Security, Classifications of Cybercrimes, The need for Cyberlaws, The Indian IT Act Challenges to Indian Law and Cybercrime Scenario in India, Weakness in Information Technology Act and it consequences, Digital Signatures and the Indian IT Act, Cybercrime and Punishment; Technology, Students and Cyberlaw; Survival tactics for the Netizens, Cyber-offenses: Cyberstalking, Cybercafe and Cybercrimes, Botnets, Attack Vector, Cloud Computing;

UNIT II

TOOLS AND METHODS USED IN CYBERCRIME: Proxy Servers and Anonymizers, Phishing and identity theft, Password Cracking, Keyloggers and Spywares, Virus and Worms, Trojan Horses and Backdoors, Steganography, DoS and DDoS Attacks, SQL Injection, Buffer Overflow; Cybercrime: Mobile and Wireless Devices: Trends in Mobility, Attacks on Wireless Networks, Credit Card Frauds in Mobile and Wireless Computing Era, Security Challenges, Registry Settings for Mobile Devices, Authentication Service Security, Attacks on Mobile/Cell Phones.

UNIT III

UNDERSTANDING COMPUTER FORENSICS: The Need for Computer Forensics, Cyberforensics and Digital Evidence, Forensics Analysis of E-Mail, Digital Forensics Life Cycle, Chain of Custody Concept, Network Forensics, Computer Forensics and Steganography, Relevance of the OSI 7 Layer Model to Computer Forensics, Forensics and Social Networking Sites: The Security/Privacy Threats, Challenges in Computer Forensics, Forensics Auditing, Antiforensics.

UNIT IV

CYBERSECURITY: ORGANIZATIONAL IMPLICATIONS: Cost of Cybercrimes and IPR Issues, Web Threats for Organizations, Security and Privacy Implications from Cloud Computing, Social Media Marketing, Social Computing and the Associated Challenges for Organizations, Protecting People's Privacy in the Organization, Organizational Guidelines for Internet Usage, Safe Computing Guidelines and Computer Usage Policy, Incident Handling, Forensics Best Practices, Media and Asset Protection, Importance of Endpoint Security in Organizations.

TEXT BOOKS:

- "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", Nina Godbole, Sunit Belapur, Wiley India Publications, April, 2011

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CE 453B PRESTRESSED CONCRETE

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

USE OF RELEVANT INDIAN STANDARD IS ALLOWED IN THE EXAMINATIONS.

UNIT I

Introduction: Basic concepts of prestressing, terminology, advantages and applications of prestressed concrete.Materials for Prestressed Concrete: High strength Concrete, permissible stresses in concrete, high strength steel, permissible stresses in steel. **Prestressing Systems**: Prestensioning and post tensioning systems, various types of tensioning devices, Lec-Macall systems, Magnel Blaton post tensioning, Freyssinet systems, Gifford Udal system.

UNIT II

Losses of Prestress : Types of losses of prestress, loss due to elastic deformation of concrete, loss due to shrinkage of concrete, loss due to creep of concrete, loss due to relaxation of stress in steel, loss due to friction, loss due to anchorage slip, total loss in pretensioned and post tensioned members. **Analysis of Prestress and Bending stresses**: Basic assumptions, resultant stresses at a section, concept of load balancing, cracking moment.

UNIT III

Deflections: Factors influencing deflections, short term deflections of un-cracked members, deflections of cracked members, prediction of long term deflections. **Shear and Torsional Resistance**: Ultimate shear resistance of prestressed concrete members, prestressed concrete members in torsion, design of reinforcements for torsion, shear and bending.

UNIT IV

Design of Flexural Members : Dimensioning of flexural members, design of pre-tensioned and post tensioned beams, design of partially prestressed members, design of one way and two way slabs, continuous beams.Design for axial tension, compression and bending, bond and bearing.

Text Books

1. Prestressed Concrete by N. Krishna Raju, TMH Publishing Company, New Delhi,
2. Prestressed Concrete by P. Dayartnam, Oxford and IBH Publication, New Delhi.

Reference books

1.Design of Prestressed Concreet Structures by T Y Lin& Ned H. Burns

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
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CE 455B CONSTRUCTION METHODS AND EQUIPMENTS

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT I

Modern Construction Methods - Open excavation, shafts and tunnels, pier and caisson foundation. Basement construction - construction Methods – supporting the excavations- control of ground water- shoring and underpinning- basement waterproofing.

UNIT II

Construction Methods for Bridges, roads railways, high rise buildings. Construction Methods for dams, harbours , river works and pipelines.

UNIT III

Construction techniques for Earth moving, excavating , drilling, blasting, tunneling and hoisting and erection.

UNIT IV

Equipment for Dredging, tunneling, dewatering. Equipment for Flooring, dewatering and floors finishing Equipment for production of aggregate and concrete – Crushers- feeders- screening equipment – batching and mixing equipment – hauling, pouring and pumping equipment – transporters

Text Books

1. Antil J.M., Civil Engineering Construction, McGraw Hill Book Co., 1982
2. Stuart Wood J.R. - Heavy construction equipment and methods, Prentice Hall Englewood Cliffs, New Jersy.
3. R.L. Peuritoy - Construction Planning equipment and methods, McGraw Hills International Book Company.

Reference Books

1. Peurifoy, R.L., Ledbette. W.B Construction Planning , Equipment and Methods McGraw Hill Co, 2000
2. Ratay., R.T Hand Book of Temporary Structures in Construction, McGraw Hill,1984.
3. Koerner., R.M, Construction & Geotechnical Methods in Foundations Engineering, McGraw Hill, 1984.
4. Varma., M., Construction Equipment and its Planning & Application, Metropolitain Book Co., 1979.
5. Smith, R.C, Andres, C.K Principles and Prentice of Heavy Construction, Prentice Hall, 1986.
6. James F. Russel - Construction equipment, Metropolitan Book Co. Delhi. 1985.
7. Principles of Construction Management by Piltcher, McGraw Hill

Reference Journals

1. ASCE Journal on Construction Engineering & Management.

Note:

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CE 457B SOIL EXPLORATION AND TESTING

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT I

Objections, site investigation in Civil Engineering process, problem solving and various stages in site investigation process. Planning and Desk Study - topographic maps, aerial photographs, applications in site investigation and interpretation of aerial photographs, Geological maps, soil and planning maps, site reconnaissance and local enquiries.

UNIT II

Geological methods - different stages, Geological exploration methods - General principle distribution of physical field in subsurface - Electrical resistivity, Seismic refraction methods, their principle, methods of survey, correction to field data, Interpretation and limitations. Index and Mechanical properties of rocks, Laboratory and insitu tests.

UNIT III

Soil Exploration methods, samples, sampling procedure, sample disturbances, samplers, Factors controlling spacing and depth of bore hole Trial pits, shafts, tunnels, auguring, and different types of drilling methods, their merits and demerits, Bore hole logging techniques (subsurface geophysical exploration) - Need for logging techniques, classification and different types logging methods. Insitu tests, SPT, SCPT, Pressure meter tests, interpretation and application, Laboratory testing, Index properties.

UNIT IV

Technical Report writing, report format, recommendations for earth work structures. highway excavations and drainage works, dams, check report, site preparation, investigation during construction and operation.

Text Books

1. Joyce, M.D. 'Site Investigation Practice;, ESFN. SPON Publishers, 1982.

References Books

1. Hunt, R.E., Geotechnical Engineering Analysis and Evaluation, McGraw Hill Book Company, 1986.
2. Bell, Fundamentals of Engineering Geology, Butterworth and Co., London, 1983.
3. Blyth, F.G.H. and De Freitas, M.H., A Geology for Engineers, Edward - Arnold publishers Ltd., 1984.
4. Legget and Karrow, Hand book of Geology in Civil Engineering, McGraw Hill Publishers, 1983.

Note:

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CE 459B ADVANCED DESIGN OF CONCRETE STRUCTURES

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

USE OF RELEVANT INDIAN STANDARDS IS ALLOWED IN THE EXAMINATIONS

UNIT I

Foundations: raft foundation, design of pile cap and piles, underreamed piles, design examples.

Building Frames: Introduction, Member stiffnesses, Loads, Analysis for vertical and lateral loads, Torsion in buildings, Ductility of beams, design and detailing for ductility, design examples.

UNIT II

Yield Line Theory: Basic assumptions, Methods of analysis, yield line patterns and failure mechanisms, analysis of one way and two way rectangular and non-rectangular slabs, effect of top corner steel in square slabs, design examples.

UNIT III

Limit state of serviceability, design of concrete structures for durability and fire resistance

UNIT IV

Design of Chimneys, Design of Bunkers and Silos

Text Books

1. Reinforced Concrete Structures, P. C. Varghese, Tata McGraw Hill
2. Advanced Reinforced Concrete Structures, P. C. Varghese, Tata McGraw Hill
3. Reinforced Concrete Design, M.L. Gambhir, Macmillan India Ltd., New Delhi
4. Behaviour, Analysis and Design of R.C.C. Structural Elements, I.C. Syal and Ummat, A.H. Wheelers, New Delhi

Reference Books

1. BIS codes
2. Plain and Reinforced concrete, Vol. 2, O P Jain and J. Krishna, Nem Chand and Bros., Roorkee

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
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CE 461B ROCK MECHANICS

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT I

Introduction, Importance and application of rock mechanics to engineering problems.
Classification, Lithological classification of rocks, Engineering classification of intact and fissured rocks, Classification of fissures, joints and faults.

UNIT II

Engineering properties of rocks, Laboratory and site measurements.
Definition of stress in rock, Simple methods of determining in-situ stresses, Borehole over covering technique, Bore hole deformation gauges, Evaluation of rock stresses and deformation around tunnels.

UNIT III

Simple methods of tunnel design.
Stability of rock slope, Modes of failure in rock mass, Analysis by simple field Bishop's method and use of Hoek's chart

UNIT IV

Foundations on rocks, Limit equilibrium methods, Plastic equilibrium of foundations, Elastic solutions for loading and excavation of foundations, Consideration of uplift pressures.
Methods of improving the properties of rock masses.

Text Books:

1. Goodman, R.E. (1989), 'Introduction to Rock Mechanics', John Wiley, Chichester.
2. Hudson, J.A. and Harrison, J.P. (2000), 'Engineering Rock Mechanics', Pergamon Press, Amsterdam.
3. Roberts, A. (1977)., 'Geotechnology', Pergamon Press, England.
4. Stagg, K.G. and Zienkiewicz (1968)., 'Rock Mechanics in Engineering Practice', John Wiley and Sons, London.

Reference books

1. Hoek, E. and Brown, E. T., "Underground Excavations", Span Press
2. Hoek, E. and Bray, J.W., "Rock Slope Engg.", Span Press

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 463B INDUSTRIAL WASTE MANAGEMENT

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	**Class Work**	:	**25 Marks**
				Examination	:	**75Marks**
				Total	:	**100 Marks**
				Duration of Examination	:	**3Hours**

UNIT - I

Introduction: Uses of water by Industry - Sources and types of wastewaters, quality criteria, effluent standards- Individual and common effluent treatment plants - Population equivalent, Effects of industrial wastes on streams, land, air and waste water treatment plants

Pretreatment Methods: Process modification – methods and materials changes – Reduce, reuse and recycle methods, house keeping etc. to reduce waste discharge and strength of the waste and established methods for by products recovery within the plant operations.

UNIT -II

Equalization – Neutralization - Oil separation – Floatation – Precipitation –Adsorption - Aerobic and anaerobic biological treatment - High rate reactors.

Chemical oxidation – Ozonation –Ion Exchange – Membrane technologies.

UNIT -III

Industrial Waste Treatment I: manufacturing process description - wastewater characteristics and waste treatment flow sheet for typical industries – Textiles – Tanneries – Pulp and Paper.

Industrial Waste Treatment I: manufacturing process description - wastewater characteristics and waste treatment flow sheet for typical industries -Metal finishing – Petroleum refining – Chemical industries - Sugar and distilleries.

UNIT- IV

Industrial Waste Treatment I: manufacturing process description - wastewater characteristics and waste treatment flow sheet for typical industries-Dairy –Iron and Steel- Fertilizers –Nuclear power plants.

Text Books

1. Eckenfelder. W.W., Industrial Water Pollution Control, McGraw Hill, 2000.
2. Arceivala.S.J. Wastewater Treatment for Pollution Control, Tata Mc.Graw Hill. 2008.

Reference Books

1. Nemerow,N.L., Theories and Practices of Industrial Wastes Treatment, Addisson
2. and Wesley, 1963.
3. Gurnham,C.F., Principles of Industrial Waste Treatment, John Wiley, New York,1948.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 465B GROUND WATER ENGINEERING

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT - I

Occurrence of groundwater, origin & distribution of groundwater, Role of Ground Water in hydrological cycle, geologic formation as aquifers, Types, Aquifer parameters
Hydro-geologic investigation, 3-D general flow equations.

UNIT - II

Groundwater movement, groundwater flow in unsaturated zones and fractured media.
Well Hydraulics: Darcy's law, Steady flow towards fully penetrating well, Equation of motion and its applications to ground water flow problems, Determination of aquifer constant in various types of aquifers, Types of tube wells, Methods of construction, Well development.

UNIT - III

Surface & subsurface investigation of groundwater
Response of confined and unconfined aquifers to pumping, leaky confined aquifers and partially penetrating wells.

UNIT - IV

Artificial recharge, Saline water intrusion
Groundwater modelling

Text Books :

1. Ground Water Hydrology: David Keith Todd
2. Fundamentals of Groundwater : Schwartz and Zhang
3. Water Resources Engineering : Ralph A. Wurbs and Wesley P. James
4. Groundwater Flow and Mass Transport Modelling (Theory and Applicatons) : M. Thangarajan

Reference Books :

1. Ground Water : Raghunath
2. Ground Water : Freeze and Cherry
3. Environmental Geology-An Earth System Science Approach : Dorothy Merritts, Andrew De Wet & Kirsten Menking
4. Applied Hydrology of Fractured Rocks : B. B. S. Singhal and R. P. Gupta
5. Groundwater Resources Development : L. Hamill and F. J. Bell
6. Construction Dewatering and Groundwater Control : J.Patrick Powers, Arthur B. Corwin, Paul C. Schmall and Walter E. Kaeck

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 467B SYSTEM DEISGN TECHNIQUES

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT - I

Errors in Numerical Calculations: Introduction, Numbers and their accuracy, Absolute, relative and percentage errors and their analysis, General error formula.

Interpolation and Curve Fitting: Taylor series and calculation of functions, Introduction to interpolation, Lagrange approximation, Newton Polynomials, Chebyshev Polynomials, Least squares line, curve fitting, Interpolation by spline functions.

UNIT - II

Fundamentals of Systemic Approach: Definitions of a system, system components, classification linear, non-linear, time-invariant, time variant systems, system synthesis, role of optimization, examples from Civil Engineering.

Linear Programming: Graphical solution, formulation of primal, Simplex method, formulation of dual, Dual Simplex method, relationship between primal and dual.

UNIT - III

Non-Linear Programming: Analytical methods, Kuhn-Tucker conditions numerical unconstrained optimization, direct search methods, descent methods, one dimensional minimization, constrained optimization direct methods, indirect methods, interior and exterior penalty function methods.

Dynamic Programming: Characteristics of dynamic programming problems, solution, Bellman's principle of optimality, multiple state variables.

UNIT - IV

Queuing System: Generalized Poisson queuing model, steady state measures of performance.

Non-Traditional Optimization Methods: Genetic Algorithms and simulated annealing.

Text Books

1. Engg. Optimization, Theory and Practice, S S Rao, New Age International
2. Operations Research:An Introduction, H A Taha, Prentice Hall of India.
3. Optimization of Engg. Design, Deb Kalyanmoy, Prentice Hall of India.

Reference Books

1. Water Resource Systems, S Vedula and P P Majmudar, Tata McGraw Hill
2. System Identification: Theory for Users, ljung Lennant, Prentice Hall

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 469B TRAFFIC ENGINEERING

B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT – I

Traffic Characteristics: Importance of traffic characteristics. Road user characteristics. Vehicular characteristics. Max dimensions and weights of vehicles allowed in India. Effects of traffic characteristics on various design elements of the road.

Traffic Studies: Taffic volume study, speed study and origin and destination study. Speed and delay study. Use of photographic techniques in traffic surveys.

UNIT – II

Traffic Accidents: Accident surveys. Causes of road accidents and preventive measures.

Capacity and Level of Service: Fundamental diagram of traffic flow. Relationship between speed, volume and density. Level of service. PCU. Design service volume. Capacity of non-urban roads. IRC recommendations. Brief review of capacity of urban roads.

UNIT– II

Traffic Control Devices: Signs, Signals, markings and islands. Types of signs, Types of signals, Design of Signal, Intersections at grade and grade separated intersections. Types of grade separated intersections.

UNIT– IV

Parking surveys : On street parking, off street parking.

Traffic Regulation: Need and scope of traffic regulations. Regulation of speed, vehicles and drivers. General traffic regulations. Motor vehicle act. Scope of traffic management.

Recommended Books

(i) Principles of Transportation Engineering by Chakroborty & Das, Prentice Hall, India.
(ii) Highway Engg *by* S.K.Khanna & C.E.G. Justo, Nem Chand Bros., Roorkee.
(iii) Traffic Engg and Transport Planning *by* L.R.Kadiyali, Khanna Publishers, Delhi.
(iv) Principles of Transportation and Highway Engineering *by* G.V.Rao, Tata McGraw-Hill Publishing Co. Ltd. N.Delhi.
(v) Traffic Engg. *by* Matson, T.M., Smith, W.S. and Hurd, F.W, McGraw- Hill Book Co., New York.
(vi) Traffic Flow Theory *by* Drew, D.R., McGraw- Hill Book Co., New York.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 402B ELEMENTS OF EARTHQUAKE ENGINEERING

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

USE OF RELEVANT INDIAN STANDARD IS ALLOWED IN THE EXAMINATIONS.

UNIT I

Introduction: Engineering seismology, Seismic zones of India, Earthquake and its causes, Types of waves, location of earthquakes, seismograph, Impact of Earthquake.

Theory of Vibrations: Free Body Diagrams, Undamped single degree of freedom systems, Damped single degree of freedom system, Response to single degree of freedom system to harmonic loads.

UNIT II

Introduction: Provisions of IS:4326

Seismic performance, repair and strengthening: Identification of seismic damage in RCC Buildings, Effect of Structural Irregularities on Performance, Criteria for Repair and Strengthening

UNIT III

Introduction to Structural Failures due to Earthquake

Introduction to IS: 1893 - 2002: Seismic analysis and design of Framed structures by equivalent lateral load procedure .

UNIT IV

Introduction to Ductile Detailing of Structures, Design of Beams and Columns as per IS 13920

Concept of Soft storey, shear walls, seismoresistant building architecture

Text Book

1. Dynamics of Structures, Clough and Penzian, McGraw Hill Publishing Co., New York
2. Structural Dynamics (Theory and Computation) Mario Paz, CBS Publishers and Distributors.
3. Earthquake Resistant Design of Structures, Pankaj Agarwal, PHI learning Private Limited

Reference Books

1. Structural Dynamics (An Introduction to computer methods), Roy R. Carig, Jr., John Wiley & Sons
2. Structural Dynamics Anil Kr. Chopra

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 404B IRRIGATION ENGINEERING II

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	2	--	5	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

Unit I

Regulation works: Canal falls-necessity and location, development of falls, design of cistern element, roughening devices. Design of Sarda type fall. Design of straight Glacis fall. Off-take alignment, Cross-Regulator and Distributory Head Regulators, devices to control silt entry into the off-taking channel and Silt Ejector, Canal Escapes.

Cross Drainage Works: Classification and their selection, Hydraulic Design Aspects of Aqueducts, Syphon Aqueducts, Super Passage, Canal Syphon and Level Crossing, Design of Canal Transitions.

Unit II

Diversion Canal Headworks: Various components and their functions, layout plan, selection of site for diversion headworks, Causes of failure of weir/barrages on permeable foundation, Bligh's creep theory, Khosla's method of independent variables, use of Khosla's curves, various corrections..

Unit III

Storage Headworks: Types of dams, selection of a site, gravity dam-two dimensional analysis, forces acting, stability criterion, elementary profile of a dam, Grout Curtain and drainage galleries, Arch dams, constant angle and constant radius arch dam, simple design and sketchs, most economical angle. Earth dam, design principles, seepage through earth dams, seepage line, control of seepage, design of filters.

Unit IV

Spillways and Energy Dissipators: Requirements of spillway and spillway capacity, types of spillways and their suitability. Design aspects of Ogee spillways, chute, side channel, shaft and syphon spillways, Energy dissipation below spillways, stage discharge and jump height curves, stilling basins, USBR and I.S. Stilling Basins for different Froude no. ranges, Design of stilling basins

Text Books

1. Theory and Design of Irrigation Structures Vol. I & II by R.S.Varshney, Gupta & Gupta.
2. Fundamentals of Irrigation Engineering by Bharat Singh

Reference Books

1. Irrigation, Water Resources and Water Power Engineering by P.N.Modi.
2. Irrigation Engineering and Hydraulic Structures by S.K.Garg.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

MGT 402B HUMAN VALUES, ETHICS & IPR

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
4	--	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3Hours

UNIT I

Introduction: Role of Engineer in Nation Building and in service of mankind.

Engineering Ethics: Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy Kohlberg's theory -Gilligan's theory - consensus and controversy - professions and professionalism professional ideals and virtues - theories about right action - self-interest-customs and religion - uses of ethical theories.

UNIT II

Human Values: Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Valuing Time – Co-operation – Commitment – Empathy – Self-Confidence – Character – Spirituality
Engineering as Social Experimentation: Engineering as experimentation - engineers as responsible experimenters - codes of ethics-a balanced outlook on law-the challenger case study

UNIT III

Engineer's Responsibility for Safety: Safety and risk - assessment of safety and risk - risk benefit analysis-reducing risk-the three mile island and Chernobyl case studies. **Responsibilities:** Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest, occupational crime.

UNIT IV

Rights: professional rights - employee rights - intellectual property rights (IPR)-discrimination, Arbitration and litigations.

Global Issues: Multinational corporations - environmental ethics-computer ethics-weapons development-engineers as managers-consulting engineers-engineers as expert witnesses and advisors-moral leadership-sample code of conduct.

Text Books

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw-Hill, New York 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.
3. W.R. Cornish, 'Intellectual Property', Universal Law Publishing Co. Ltd., Delhi, 2001.
4. P.S. Narayan, 'Intellectual Property Law in India', Gogia Law Agency, 1999.

References

1. Charles D. Fleddermann, "Engineering Ethics", Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint now available).
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics – Concepts and Cases", Wadsworth Thompson Leatning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.
5. Avinash Shivade, 'Intellectual Property Manual' , Lexis, Nexis, 2004

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 452B : DOCK AND HARBOUR ENGINEERING

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits
3	1	--	4

Class Work	:	**25 Marks**
Examination	:	**75Marks**
Total	:	**100 Marks**
Duration of Examination	:	**3 Hours**

UNIT – I

Growth and regulation of Ports: History of Port – Classification of Harbours - Factors affecting the growth of Port. - Requirement of a Harbour- General Planning Port capacity –traffic analysis - Berth occupancy – financial evaluation - EIA -Description of selected Indian ports.

UNIT – II

Harbour Planning (Technical): Site investigation – harbour entrance - Navigational Channel – Depth of harbour – Turning basin – Anchor basin – berthing area – Storage area - Shipping terminal facilities – Essentials of passenger terminal, dry bulk cargo terminal, Liquid bulk cargo terminals and container terminals.

UNIT – III

Introduction to ocean waves – Wave transformation – Wave and wind climate inside Harbour.
Break waters: Types – Factors determining their selection – Forces on break waters – Design of rubble mound and vertical break waters – Physical Model Studies.
Berthing structures – Types – Loads – Selection of berthing structures – Design principles of diaphragm walls, dolphins and piles.

UNIT – IV

Selection and Design principles of Dock fenders and Mooring accessories.
Design principles of dock structures - Graving dry dock – Slip way – floating dry dock.
Monitoring and repair of harbour structures - Dredging - Navigational aids – Light house.

Text Books

1. Harbour and Coastal Engineering (Indian Scenario) Vol - I & Vol – II; S. Narasimhan & S. kathiroli, NIOT- Chennai
2. Design and construction of Port and marine Structures – Alonzo Def. Quinn – McGraw – Hill book Company

References

1. IS: 7314 1974 - Glossary of terms relating to Port and harbour Engineering.
2. IS: 4651 - Code of practice for Planning and Design of Port and harbour (Part – I) Site Investigation, (Part – II) Earth Pressure, (Part – III) Loading, (Part – IV) General Design Consideration, (Part – V) Layout and functional Requirement.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-454B: ROAD SAFETY AND ENVIRONMENT

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT – I

Planning for Network, Land Use and Road Environment for Safety, Designing for Safety: Road Link Design, Junctions.

Introduction to Road Safety Engineering and Crash Investigation, Human Factors Relating to Crashes/Accidents, Crash/Accident Investigation & Crash Problem Diagnosing, Crash Problems into Solutions & Crash, Investigation Reporting, Crash/Accident Costing, Economic Appraisal.

UNIT – II

Road Safety Auditing- An Introduction, How to Conduct Road Safety Audit, Design Stage Road Safety Audit, Road Safety Audits of Land Use Developments, Traffic Control Devices & Safety, Needs of Different Road Users, Road Safety Audit in Road Works & Pre Opening Safety Audit..

Street Lighting & Traffic Signals, Provisions for NMT Vehicles in India, Safety Provisions for Pedestrians & Cyclists, Road Signs and Pavement Markings.

UNIT – III

Safe System Approach- A Global Perspective, Speed Management & safety, Safe System and Speed & Assessing speed limit, Type of speed limit & Speed zone signing Infrastructure to support safe speed feedback and enforcement.

Hazard Management Organizational commitment & encouraging RSA, Road Safety Audit Checklist.

UNIT – IV

Site Visits and Preparation of the Audit Reports.

Risk Assessment & Prioritization of audit recommendations, Solutions and effectiveness & Corrective, Action Report.

Text Books

1. Highway Engineering by Khanna and Justo, Nem Chand & Brothers, Roorkee
2. Highway Engineering by L.R. Kadyali, Nem Chand & Brothers, Roorkee

Reference Books

1. Highway Engineering by Oglesby and Hews
2. Transportation Engineering by G.V. Rao, Tata McGraw Hill Publisher, New Delhi
3. Traffic Engineering by Matson,Smith & Hurd
4. Road safety audit Manual

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-456B CONSTRUCTION MANAGEMENT

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit-I

Waste Management: Introduction to waste and waste management. The concepts of waste productivity and its interrelationship with productivity. System concept of waste. Complementarily of waste and resource management.

Unit-II

Quality Management: Concept of quality management. Product vs. system quality. Quality assurance. Quality circles. Total quality management. ISO-9000 series and construction project.

Unit-III

Materials & Inventory Management: Material management. Requirements and purchases. Different methods of inventory management. Mathematical modeling. Suitable inventory model for construction.

Unit-IV

Risk Management: Decision theory, Decision under certainty. Probility and uncertainty, Decision risks. Risks involved in decisions pertaining to construction industry. Risk. management, Insurance against risks.

Management Information System: Principles of management information systems. Necessity and importance. Requirements of a good M.I.S. as a tool of data collection and dessimation. Use of table and charts. Artificial intelligence. Expert systems. Decision support systems.

Reference Books:

1) Management Information Syatem by W.S. Jawadekar
2) Total Project Management by PK Joy
3) Construction Management and Planning by R. Sengupta

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-458B SOIL DYNAMICS

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	2 Hours

UNIT I

Nature of dynamic loads, stress conditions on soil elements under Earthquake loading. Theory of vibrations.

Dynamic Earth Pressure problem and retaining walls: Behaviour of retaining walls during earthquakes. Modification of Coulomb's theory, Modified graphical constructions for lateral earth pressure, Analytic solution of C - ϕ soils, Indian standard code of practice. Dynamic Properties of soils.

UNIT II

Liquefaction of Soils: Theory, criterion of liquefaction, factor affecting and its determination, laboratory studies in Triaxial shear and oscillatory simple shear, Evaluation of liquefaction potential by various methods.Vibration table studies.

Liquefaction behaviour of loose and dense sands; silt and clayey silts. Introduction to Machine Foundations , Criteria for satisfactory functioning of machine foundation, methods of analysis, Degrees of freedom of a block foundation, Soil spring stiffness coefficients.

UNIT III

Block Foundation: Vibrations of a block, determination of dynamic coefficient by various methods. Design procedure for block foundation.

UNIT IV

I.S. method for design of reciprocating machines. Design Requirements of reciprocating , Methods of Designs, Machines Introduction to the dynamics of dams and reservoirs.

Text Books

1. Rao, Kameswara "Vibration Analysis and Foundation Dynamics" Wheeler
2. Saran, Swami, "Soil Dynamics and Machine Foundations" Galgotia, New Delhi.

Reference Books

1. Prakash, S., Soil Dynamics, McGraw Hill International Edition, New York. Publishing, New Delhi.
2. Barken, D.D., "Dynamics of Bases and Foundations," McGraw Hill Book Company, New York.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
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CE-460B GROUND IMPROVEEMNT

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

Introduction to different methods of ground improvement and its importance. Mechanical method of ground improvement, Ruthfuch method; methods based on PI.

Ground Freezing, methods, Hydrogeology of frozen soils, strength and behaviour of frozen soils. Ground heating, effect on soil properties, methods.

UNIT II

Drainage Techniques, filter drains, sand drains, sandwicks & band drains, lime columns. Electro-osmosis and Electrochemical stabilization.

Compaction & consolidation techniques viz. pre-compression, compaction piles, vibro-compaction (Vibro-floatation, Terra-probe, vibro-replacement, concrete columns & vibro-displacement), Dynamic compaction, explosive compaction.

UNIT II

Soil Reinforcement, load transfer mechanism, strength development, anchored earth. In-situ reinforcement techniques viz soil nailing, reticuled micropiles, soil dowels and anchors.
Grouts, properties, penetration, clay, cement clay, cement, clay-chemical, chemical and Bituminous grouts, grouting methods viz penetration, claquage, compaction & jet.

UNIT IV

Reinforced earth; Introduction, Mechanism of reinforced types of reinforcement strength characteristics. Design of reinforced earth retaining walls, abutments, earth slopes.

Exclusion techniques viz. sheet piles, contiguous bored piles, secant piles, slurry trenches. Diaphragm walls. Design of stone columns.

Text Books

1. Ground Improvement Techniques by P. Purushotham Raj, Tata McGraw Hill, ND.
2. Engineering Treatment of Soils by F.G. Bell, E & FN Spon Publishers, UK.

Reference Books

1. Engineering Principles of Ground Modification by M.R. Hausmann, McGraw Hill Publishers, New York.
2. Ground Improvement Techniques & their Evolution by W.F. Van Impe., A.A. Balkema Publishers, Netherlands.
3. Koerner, R.M., Construction & Geotechnical methods in foundation engineering, MGH, New York,1985
4. Bowle's.J.E., Foundation Analysis and design,4th edition,MGL,1998.
5. Jones.C.J.F.P., Earth reinforcement and soil structures, Butter worth &co., London,1985
6. Arora.K.R., Soil mechanics and foundation Engineering,SPD,2001

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-462B ENERGY EFFICIENT BUILDING

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

Introduction: Fundamentals of energy - Energy Production Systems - Heating, Ventilating and air conditioning –Solar Energy and Conservation - Energy Economic Analysis - Energy conservation and audits -Domestic energy consumption - savings -Energy use in buildings - Residential - commercial buildings.

Environmental: Energy and Resource conservation - Design of green buildings - Evaluation tools for building energy - Embodied and operating energy - Peak demand - Comfort and Indoor air quality - Visual and acoustical quality - Land, water and materials - Airborne emissions and waste management.

UNIT II

Design: Natural building design consideration - Energy efficient design strategies - Contextual factors - Longevity and process Assessment -Renewable energy sources and design.

Advanced building Technologies - Smart buildings - Economies and cost analysis.

Services: Energy in building design - Energy efficient and environment friendly building – Thermal phenomena - thermal comfort - Indoor Air quality - Climate, sun and Solar radiations.

UNIT III

Psychometrics - passive heating and cooling systems - Energy Analysis - Active HVAC systems - Preliminary Investigation – Goals and policies.

Energy audit: Types of energy audit - Analysis of results - Energy flow diagram – Energy consumption/ Unit production - Identification of wastage -Priority of conservative measures - Maintenance of management programme.

UNIT IV

Energy Management: Energy management of electrical equipment - Improvement of power factor – management of maximum demand - Energy savings in pumps - Fans - Compressed air systems - Energy savings in Lighting systems - Air conditioning systems - Applications.

Text Books

1. Moore F., Environmental Control System McGraw Hill, Inc., 1994.
2. Brown, G Z, Sun, Wind and Light: Architectural design strategies, John Wiley, 1985.

Reference Books

1. Cook, J, Award - Winning passive Solar Design, McGraw Hill, 1984.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-464B WATER POWER ENGINEERING

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit I

Introduction: Sources of power , estimation of water power, necessity and importance of harnessing small hydro power, flow duration and power duration curves, load curve, load factors, capacity factors, utilisation factors, firm and secondary power.

Types of Hydro Power Plants: Elements of Hydro power, classification of hydro-power plants, run-of-river plants, storage plants diversion canal development, pumped storage plants, tidal power plants, base load and peak load plants in a power grid.

Unit II

Intakes: Intake structures, functions and their types, components of intakes-forebay, trash racks, gates and valves, force required to operate gates.

Unit III

Conveyance System: Penstocks, design criterion, economical diameter anchor blocks, cradles and footings, water hammer, instantaneous closure of power canal, surge tank, surges in canals.

Unit IV

Turbines: Types of turbines, specific speed and classification of turbines, synchronous speed, scroll casing , flumes and draft tubes, dimensions of scroll casing and draft tubes, setting of turbines

Power House: General layout and arrangements of hydro-power units, number and size of units, sub-structure, spacing of units, super-structure, underground power stations, tidal power

Text books

1. Water Power Engineering, Dandekar, M.M., Sharma,K.N.
2. Water Power Engineering, Borrows, H.K
3. Water Power Engineering, M.M.Deshmukh.

Reference Books :

1. Hydro-Electric Engineering Practice Vol.I ,II & III Brown J.G.
2. Water Power Development, Vol.I & II, Mosonyi,E.
3. Hydro Power Structures, R S Varshney, Nem Chand& Bros

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-466B ENVIRONMENT IMPACT ASSESSMENTS

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT-I

Basic Concepts of Environmental Impact Assessment: Description of the project and the environmental setting, identification of impacts, measurement and monitoring, prediction and assessment of impacts and communication of impacts.

UNIT -II

Environmental Impact Assessment Methodologies: Checklists, matrices, networks and overlays Prediction and Assessment of Impact on the physical environment, on the resources, on the economic activities, and on the socio-economic and political well being of local human settlements, Environmental cost benefit analysis Sustainable development.

UNIT-III

Environmental auditing: Definition and types of audits, EMS audits, performance audits; compliance audits, registration audits ISO 14000 series of standards and environmental auditing, Methodologies for Environmental Auditing: Objectives, audit teams, planning audits, conducting audits, reporting audit findings

UNIT -IV

Acts: Water act, Water Cess act, Air act, Environment Protection act and their amendments, Wildlife act and Forest acts.

Text Books

1.R.E. Munn, Environmental Impact Assessment, John Wiley, New York, USA

2. Pollution Control Law Series; PCL/2/2001, Central Pollution Control Board, New Delhi.

3. Eds, Jain and Clark, Environmental Technology Assessment and Policy, John Wiley, New York, USA

4. National Conservation Strategy and Policy Statement on Environment and Development, Govt. of India, New Delhi

5. A guide to Manufacture, Storage and Import of Hazardous Chemicals Rules, Ministry of Environment and Forests, Govt. of India, New Delhi.

6. Canter, L.W., Environmental Impact Assessment, McGraw Hills, New York, USA

7. Woodside, Gayle and Patrick Aurrichio, ISO 14001 Auditing Manual, McGraw Hills, New York, USA

8. Pollution Control Acts, Rules and Notifications issued thereunder, Central Pollution Control Board, New Delhi.

9. Environmental Impact Assessment: A Manual, Ministry of Environment and Forests (Impact Assessment Division), Govt. of India, New Delhi

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-482B FINITE ELEMENT METHODS

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT I

Introduction and basic concepts. Energy approach and variation principles in Finite-Element Method.

Basics Elements I: Various element shapes, Isoparametric elements, Axi-symmetric elements, plate bending elements.

UNIT II

Basic Elements II: introduction to 3-D elements, shell elements, interface elements, boundary elements, infinite elements.

Direct and variational formulations of element stiffness and loads.

UNIT III

Assemblage of elements, Boundary Conditions and Solution of overall problems.

UNIT IV

Techniques of nonlinear analysis: Mesh generation, graphic display and software packages.

Organization of FEM programs, efficient solutions, input/output, pre and post processors.

Text Books

4. Finite Element Analysis—Theory and Programming, C S Krishnamurthy, TMH Publication, New Delhi
5. Concept and Application of Finite Element Analysis, R D Cook, D S Malcus, John Wiley, Newyork.

Reference Books

2. Introduction to Finite Element Method, C S Desai and J F Abel, Affiliated East West Press, New Delhi.
3. Finite Element Primer, V K Manicka Selvam, Dhanpat Rai Publication, New Delhi

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-484B RURAL WATER SUPPLY AND SANITATION

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit-I

Concept of environment and scope of sanitation in rural areas. Magnitude of problems of rural water supply and sanitation. Population to be covered, difficulties. National policy.

Water supply: Design population and demand loads. Various approaches of planning of water supply schemes in rural areas. Development of proffered sources of water springs. Wells, infiltration wells, radial wells and infiltration galleries, collection of raw water from surface source. Specific practices and problems encountered in rural water supply.

Unit-II

Improved methods and compact systems of treatment of surface and ground waters for rural water supply. Brief Details of multi-bottom settlers (MBS), diatomaceous earth filter, cloth filter, slow sand filter, chlorine diffusion cartridges.

Pumps, pipe materials, appurtenances and improved devices for use in rural water supply. Planning of distribution system in rural areas.

UNIT-III

Community and sanitary latrines. Various methods of collection and disposal of night soil.

Planning of waste water collection system in rural areas. Treatment and Disposal of waste water.

Compact and simple waste water treatment units and systems in rural areas such as stabilization ponds, septic tanks, Imhoff tank, soak pit etc. Disposal of waste water soakage pits and trenches.

Unit-IV

Disposal of Solid Wastes. Composting, land filling, incineration, Biogas plants, Rural health.

Other specific issues and problems encountered in rural sanitation

Text Books

1. Excreta Disposal for Rural Areas and Small Communities. Wagner, Lanoix, WHO Publication.
2. Small Community water supplies - Holket (ed.) John Wiley & Sons.

Reference Books

1. Manual on Water Supply and Treatment - CPHEEO Govt. of India.
2. Water Treatment and Sanitation – Simple Method for Rural Area' by Mann H.T. and Williamson D.
3. 'Water Supply and Sewerage', by E.W.Steel & T.J.Mcghee, McGraw Hill.
4. 'Manual on Water Supply and Treatment', CPHEEO, Mini. Of Urban Development, Govt. of India.
5. 'Manual on Sewerage and Sewage Treatment', CPHEEO, Mini. Of Urban Development, Govt. of India

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-486B DISASTER MANAGEMENT

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:
1. To introduce the basic concept, disaster management act and significance of Disaster Management
2. To study hydro-metrological disaster, its forecasting, significance of early warning and structural and non structural measures codal provisions
3. To study geological based disaster, seismic zones in India and structural and non structural measures required as per codal proivisons
4. To know technological disaster; fire; chemical; traffic; Indian standards provision for mitigation
5. To learn significance of latest techniques of remote sensing and GIS in disaster management.

Course Outcomes: A student will be able to
1. Know the significance of disaster management,
2. Study the occurrences, reasons and mechanism of various types of disaster
3. Learn the preventive measures as Civil Engineer with latest codal provisions
4. Apply the latest technology in mitigation of disasters

Unit-I

Introduction to Disaster Management: Disaster, Emergency, Hazard, Mitigation, Disaster Prevention, Preparedness and Rehabilitation, Risk and Vulnerability, Classification of Disaster, Natural and Man made Disasters, International day and Decade of Disaster Reduction.

Risk and Vulnerability to disaster mitigation and management options: Warning and Forecasting.

Unit-II

Hydro-meteorological based disasters I: Disaster Management Act 2005, Role of NDMA, NDRF, NIDM, Tropical Cyclones, Floods, droughts, mechanism, causes, role of Indian Metrological Department, Central Water Commission, structure and their impacts, classifications, vulnerability, Early Warning System, Forecasting, Flood Warning System, Drought Indicators, recurrence and declaration, Structural and Non-structural Measures.

Hydro-meteorological based disasters II: Desertification Zones, causes and impacts of desertification, Characteristics, Vulnerability to India and Steps taken to combat desertification, Forest Fires; Causes of Forest Fires; Impact of Forest Fires, Prevention.

Unit-III

Geological based disasters: Earthquake, Reasons, Compression, Shear, Rayleigh and Love Waves; Magnitude and Intensity Scales, Direct and Indirect Impact of Earthquake; Seismic Zones in India, Factors, Indian Standards Guidelines for RCC and Masonry Structures, Prevention and Preparedness for Earthquake, Tsunamis, Landslides and avalanches: Definition, causes and structure; past lesson learnt and measures taken; their Characteristic features, Impact and prevention, Atlas (BMTRPC); structural and non structural measures.

Unit-IV

Manmade Disasters I: Chemical Industrial hazards; causes and factors, pre- and post disaster measures; control ; Indian Standard Guidelines and Compliance;

Traffic accidents; classification and impact, Fire hazards; Classification as per Indian Standards;

Fire risk assessment; Escape routes; fire fighting equipments; classification of buildings, fire zones, occupancy loads; .capacity and arrangements of exists,

Use of remote sensing and GIS in disaster mitigation and management.

Text Books

1. Thomas D. Schneid., Disaster Management and Preparedness, CRC Publication, USA, 2001
2. Patrick Leon Abbott, Natural Disasters, Amazon Publications, 2002
3. Ben Wisner., At Risk: Natural Hazards, People vulnerability and Disaster, Amazon Publications, 2001

4. Oosterom, Petervan, Zlatanova, Siyka, Fendel, Elfriede M., "Geo-information for Disaster Management", Springer Publications, 2005
5. Savindra Singh and Jeetendra Singh, Disaster Management, Pravalika Publications, Allahabad
6. Nidhi Gauba Dhawan and Ambrina Sardar Khan, Disaster Management and Preparedness, CBS Publishers & Distribution

Reference Books

1. Selected Resources Published by the National Disaster Management Institute of Home Affairs, Govt. of India, New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-488B WASTE MANAGEMENT

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT -I

Types of Industrial Waste: Liquid, solid, atmospheric and hazardous, Hazardous wastes: Characterization and treatment.

Solid wastes, non-hazardous wastes and hazardous wastes: Definition, sources and characteristics; Sampling and analysis techniques; Inventorying wastes; Strategies for source reduction, for the recovery of residual substances, byproducts and resources and for recycling and reuse of wastes.

UNIT -II

Municipal solid waste management: Segregation and recycling and reuse of wastes; Collection, transportation and storage of municipal solid waste; Resource recovery from wastes; waste exchanges; Municipal solid waste management programs.

Treatment and disposal: Biological and chemical treatment of hazardous wastes; Composting and vermi-composting of wastes.

UNIT -III

Solidification and stabilization of wastes; Incineration for the treatment and disposal of municipal solid wastes and hazardous wastes.

Land farming; Landfill disposal of municipal solid waste and hazardous waste; and Bioremediation.

UNIT -IV

Electronic waste Management.

Legal requirements: Municipal solid waste rules; Hazardous waste rules; Biomedical waste rules; Rules related to recycled plastics, used batteries, flyash, etc.

Text Books

1. Pollution Control Acts, Rules and Notifications Issued Thereunder. Pollution Control Law Series: PCLS/02/1992. Central Pollution Control Board, Delhi.
2. Management of Municipal Solid Wastes - Status and Options. Control of Urban Pollution Series (CUPS/41/1994-95). Central Pollution Control Board. Delhi.
3. Hazardous waste management. M.D. LaGrega, P.L. Buckingham, J.C. Evans and the Environmental Resources Management Group. McGraw-Hill International Editions.

Reference books

1. Solid waste management in developing countries. A.D. Bhide and B.B. Sundaresan. INSDOC-UNESCO, New Delhi.
2. Environmental Engineers Handbook. D.H.F. Liu and B.B. Liptak. Lewis Publishers, New York.
3. Management of Solid Wastes in Developing Countries. Frank Flintoff. World Health Organization. New Delhi.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-490B MASS RAPID TRANSPORT SYSTEMS

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT – I

Role of Transportation: History of transit, Recent Trends in transit, Mass transportation characteristics, Demand Characteristics: Spatial, temporal and behavioral characteristics.

Mass Transportation Planning: Transportation demand surveys, Mass transportation demand estimation, Demand projection, Trip generation, Trip distribution, Model split and route assignment.

UNIT – II

Transport system Performance: Performance evaluation and analysis, Structure of decisionmaking, Evaluation and selection methods, selection procedure. Generation of alternative schemes, Economic evaluation methods.

Terminals: Functions of terminals, Design, Typical Terminal characteristics.

UNIT – III

Scheduling and Routes: Service analysis, Vehicle dispatch policy, Vehicle Requirements, Spacing of bus stops, Route spacing and performance.

Management: Operational and management issues in transport planning, Reserved bus lanes and signals, Vehicle monitoring and control system,, Nodal coordination.

UNIT – IV

Special Systems: People mover systems, Underground transportation, para transit, Rail transit system, case studies.

Text Books

1. Kristhi, Lal, Transporation Engineering, PHI, Delhi, 2008 Hay, W.W., An Introduction to Transportation Engineering, 2nd Ed., John Wiley & Sons, 2001
2. Kadiyali, L. R, "Traffic Engineering and Transport Planning", Khanna Publishers New Delhi – 110006, 2006

Reference Books

1. Hutchinson, Urban Transport Planning, John Wiley, 2006
2. Dickey, J.W., et. al., Metropolitan Transportation Planning, TMH edition, 2002.
3. Paguette, R.J., et.al, Transportation Engineering - Planning and design, 2nd edn., John Wiley & Sons, 2002.
4. Railis, V.R, Intercity Transport, Engineering and Planning, The Macmillan Press, 2003.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-492B WATER RESOURCES PLANNING AND MANAGEMENT

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit I

Water Resources Planning: Role of water in national development, assessment of water resources, planning process, environmental consideration in planning, system analysis in water planning, some common problems in project planning, functional requirements in multipurpose projects, multipurpose planning, basinwise planning, long term planning.

Unit II

Reservoir planning-dependable yield, sedimentation in reservoir, reservoir capacity, empirical-area reduction method.

Economic and Financial Analysis: Meaning and nature of economic theory, micro and macro economics, the concept of equilibrium, equivalence of kind, equivalence of time and value, cost benefit, discounting factors and techniques, conditions for project optimality, cost benefit analysis, cost allocation, separable and non-separable cost, alternate justifiable and remaining benefit methods, profitability analysis.

Unit III

Water Resources Systems Engineering: Concept of system's engineering, optimal policy analysis, simulation and simulation modeling, nature of water resources system, analog simulation, limitations of simulation, objective function, production function, optimality condition, linear, non-linear and dynamic programming, applications to real time operations of existing system, hydrologic modeling and applications of basic concepts.

Unit IV

Applications of System Approach in Water Resources: Applications of system engineering in practical problems like hydrology, irrigation and drainage engineering, distribution network, mathematical models for forecasting and other water resources related problems.

Text Books

1. Linsely et al., "Water Resource Engineering", McGraw Hill Publishing Company, New York.
2. L.D. James and R. R. Lee, "Economics of Water Resources Planning", McGraw Hill Publishing Company, New York.
3. Loukes et al., "Water Resources Systems Planning and Analysis", Prentice Hall of India, New Delhi
4. Water Resources Systems Planning & Economics by R.S.Varshney
5. Optimisation Theory and Applications by S.S.Roy

Reference Books

1. M.C. Chaturvedi, "Water Resources Planning and Management", Tata McGraw Hill.
2. B.C. Punmia and R.B. Pande "Irrigation and Water Power Engineering", Standard Publishers.
3. V.T. Chow, "Applied Hydrology", McGraw Hill Publishing Company, New York.
4. S.K. Garg, "Irrigation Engineering and Hydraulic Structures", Khanna Publishers, ND.
5. Operational Research-An Introduction by Hamdy A.Taha

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-494B DESIGN OF MASONRY

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit I

Introduction: Brick masonry units, Concrete masonry units, types, grades and properties of concrete masonry units, mortar, grout and plaster.
Masonry construction, types of bonds, bond at connections, types of joints, contraction and expansion joints
Brick Masonry in Buildings: Brickwork, brick walls, brick columns and piers. Allowable stresses, cross sectional area, shape factor of units, slenderness ratio. Type of loading, net permissible stresses, composite brick concrete piers. Bed stone and bed plates.

Unit II

Laterally loaded Masonry Structure: Structures and loads, stability of masonry, masonry dams, retaining walls.
Foundations, Piers, Walls and Abutments: Wall and column footings in buildings, bridge foundations, the substructure, loads on substructures. Determination of safe bearing capacity. Lateral load resistance of well foundations.

Unit III

Structural Design: General, Load Dispersion, arching action, design thickness/cross section. Design of foundations, piers, walls, dams and retaining walls, design of RBC slabs, lintels, Reinforced Brick columns.
Masonry Arches and Domes: Arches in buildings, stability of masonry arches. Design of masonry arches by elastic theory. Analysis of masonry domes – stability of masonry domes.

Unit IV

Seismic Design of brick masonry buildings**.** Introduction to SP20 (S&T):1991 "Handbook on Masonry Design and Construction".

Text Book

1. Structural Design in Steel, Masonry and Timber by A.S. Arya, Nem Chand & Bros.
2. Building Construction, Sushil Kumar, Standard Publishers and Distributors

Reference Books

1. SP20 (S&T): 1991 "Handbook on Masonry Design and Construction".

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE-496B BRIDGE ENGINEERING

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Unit I

Investigation of Bridges: Definition, components of a bridge, classifications, importance of bridges. Need for investigations, selection of bridge site, preliminary data to be collected, design discharge and its determination, linear waterway, economical span, vertical clearance above HFL, scour depth, choice of bridge type

Standard Specifications: Road bridges, I.R.C. loadings, code provisions on width of carriageway, clearances, loads considered etc. Standard specifications for railway bridges, Railway bridge code.

R.C.C. Culvert, Skew Culvert

Unit II

Reinforced Concrete Bridges: T-beam bridge, Courbon's theory for load distribution. Balanced cantilever bridges, pre-stressed concrete bridges, (General discussions).

Unit III

Steel Bridges: Introduction to suspension bridges, cantilever bridges, cable-stayed bridges. General arrangement of single-track broad-gauge railway bridge with open floor, design of stringers, cross girders, main trusses, top and bottom lateral bracing, complete design of through type truss bridge.

Sub Structure: Types of piers and abutments, design forces, design of piers and abutments.

Unit IV

Bearing and Joints: Various types of expansion bearing and fixed bearings, elastomeric bearings, joints and their types, design of bearings

Construction, inspection and maintenance of bridges.

Text Books

1. Elements of Bridge Engineering, D. Johnson Victor, Oxford and IBH Publishers, New Delhi.
2. Design of Steel Structures, A.S. Arya and J.L. Ajmani , Nem Chand Brothers, Roorkee.

Reference Books

1. Design of Concrete Bridges, Khanna Publishers, New Delhi, Vazirani & Ratwani.
2. Analysis, Design and Construction of Bridges by V.K. Raina, Tata McGraw Hill

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE 406 B IRRIGATION ENGINEERING - II LAB

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits			
-	-	3	1.5	**Class Work**	:	**20Marks**
				Examination	:	**30Marks**
				Total	:	**50 Marks**
				Duration of Examination	:	**3 Hours**

1 Design and drawing of Sloping Glacis Weir on permeable foundation for surface and sub surface flow conditions.
2 Design of Sarda type fall & sloping glacis fall.
3 Seepage line in a homogeneous earth dams on impermeable foundation with horizontal drainage using viscous analogy.
4 Design of Ogee Spillway for a given design discharge and head condition.
5 Design of stilling basin for a given flow conditions.
6 Obtaining flow-nets for simple cases by trial and error, electrical analogy or viscous analogy.
7 Design and drawing of Syphon Aquaduct.
8 Drawing of various types of Arch Dam, their plan and sectional view for a given section of a valley.
9 Design of a Gravity Dam section.

Note: It is must that a student appears in examination with at least 7 complete experiments from the above list.

CE 408B PROJECT

B. Tech. Semester – VIII (Civil Engineering)

L	T	P	Credits			
--	--	8	8	**Class Work**	:	**75 Marks**
				Examination	:	**125Marks**
				Total	:	**200 Marks**
				Duration of Examination	:	**3 Hours**

The project started in VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

Chairperson of Department	: Chairperson
Project coordinator	: Member
External expert	: To be appointed by the University

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of, maximum of 2 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B. Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

GFCE – 402 GENERAL FITNESS FOR THE PROFESSION

B. Tech. Semester – VIII (Civil Engineering)

L	T	P	Credits	Examination	:	100 Marks
--	--	--	4	Total	:	100 Marks

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

The evaluation will be made by the committee of examiners constituted as under:

1. Dean, Faculty of Engineering & Technology/ Director /Principal of affiliated college : Chairperson
2. Chairperson of the department : Member
3. External expert : Appointed by the university

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the form of a written report highlighting followings:

I. Academic Performance --------

II. Extra Curricular Activities / Community Service, Hostel Activities **(12 Marks)**

III Technical Activities / Industrial, Educational tour **(12 Marks)**

IV Sports/games **(16Marks)**

Note: Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/her achievement and verbal & communicative skill through presentation before the examiners. **(40 Marks)**

C. Faculty Counselor Assignment **(20 Marks)**

It will be the duty of the student to get evaluated by respective faculty counselor and to submit the counselor assessment marks in a sealed envelope to the committee.

A counselor will assess the student which reflects his/her learning graph including followings:

1. Discipline throughout the year
2. Sincerity towards study
3. How quickly the student assimilates professional value system etc.
4. Moral values & Ethics- Syllabus (one lecture/week on the topics of Human values/Ethics is to be delivered)

CE – 201B: STRENGTH OF MATERIALS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
3	1	--	4	Class Work	:	25 Marks
				Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

Course Objectives:
1. To introduce different types of stresses and deformations
2. To analyze the forces on statically determinate beams subjected to various kinds of loads
3. To analyze the deformation of statically determinate beams subjected to various kinds of loads
4. To study the behavior of compression members subjected to axial and eccentric loadings

Course Outcome:
1. Knowledge of various types of stresses and strains and their analysis
2. Analysis of forces on statically determinate beams
3. Analysis of deformations of statically determinate beams
4. Analysis of columns loaded axially and eccentrically.

UNIT - I

Introduction: Concept of Equilibrium General Equilibrium equations, concept of free body diagrams , Concept of stress and strain, generalized Hooke's law, Stress-strain diagram of ductile and brittle material, compound and composite bars, thermal stresses, Analysis of Principal stresses and Strains, Mohr's stress circle, Relationship among elastic constants.

Shear force and Bending moment diagrams: Types of load on beam and frames, classification of beams, statically determinate and indeterminate problems, shear force and bending moment diagrams: simply supported, overhung and cantilever beams subjected to any combination of point loads, uniformly distributed and varying load and moment, relationship between load, shear force and bending moment.

UNIT – II

Theory of pure bending: Centroid of simple and built up section, second moment of area, derivation of flexural formula for straight beams, bending stress calculation for beams of simple and built up section, RCC beams.

Shear Stresses in Beams: Shear stress formula for beams, shear stress distribution in beams.

UNIT – III

Torsion of Circular shafts: Basic assumptions, torsion formula, power transmitted by shafts, design of solid and Hollow shafts based on strength and stiffness.

Columns & Struts: Column under axial load, concept of instability and buckling, slenderness ratio, derivation of Euler's formulae for the elastic buckling load, Eulers, Rankine, Gordon's formulae Johnson's empirical formula for axial loading columns and their applications, eccentric compression of a short strut of rectangular & circular sections, Numerical.

UNIT - IV

Slope & Deflection: Relationship between bending moment, slope & deflection, Mohr's theorem, moment area method, method of integration, Macaulay's method, calculations for slope and deflection of (i) cantilevers and (ii) simply supported beams with or without overhang under concentrated load, Uniformly distributed loads or combination of concentrated and uniformly distributed loads, Numericals.

Strain energy: strain energy under axial, bending, shear, torsion, gradual, sudden and impact loading, theories of failures

Text Books

6. Strength of Materials by G H Ryder, ELBS publishers
7. Elements of Strength of Materials by Timoshenko & Young, East- West Press, New Delhi
8. Mechanics of Materials by Beer and Johnston, Tata McGraw Hill.
9. Elementary Structural Analysis, Norris & Wilbur, McGraw Hill Publisher
10. Engineering Mechanics Shames

Reference Books

3. Strength of Materials by Sadhu Singh, Khanna Publishers
4. Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.
3. Fundamentals of Solid Mechanics by M L Gambhir, Prentice Hall of India
4. Strength of Materials Ramamurtham and Narayanan, S. Chand & Co.
5. Fundamentals of Structural Analysis B D Nautiyal, New Age Publishers

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2.The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.