SCHEME OF STUDIES & EXAMINATIONS

Department: Civil Engineering – 8th Semester

Sr. 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 402 B	ELEMENTS OF EARTHQUAKE ENGINEERING	3	1	-	25	75	-	100	4	3
2	CE 404 B	IRRIGARION ENGINEERING - II	3	2	-	25	75	-	100	5	4
3	MGT 402 B	HUMAN VALUES, ETHICS AND IPR	4	-	-	25	75	-	100	3	3
4		DEPARTMENTAL ELECTIVE - II*	3	1	-	25	75	-	100	4	3
5		DEPARTMENTAL ELECTIVE – III#	3	1	-	25	75	-	100	4	3
6	CE 406 B	IRRIGATION ENGINEERING – II LAB	-	-	3	25	75	-	100	4	3
7	CE 408 B	PROJECT	-	-	8						
8	GPCE 410 B	GENERAL FITNESS FOR THE PROFESSION	-	-	-	20	-	30	50	1	3
Total			16	5	10	370	450	30	850	33	

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 452	DOCKS AND HARBOUR ENGINEERING	1	CE 482	FINITE ELEMENT METHODS
2	CE 454	ROAD SAFETY AND ENVIRONMENT	2	CE 484	RURAL WATER SUPPLY AND SANITATION
3	CE 456	CONSTRUCTION MANAGEMENT	3	CE 486	DISASTER MANAGEMENT
4	CE 458	SOIL DYNAMICS	4	CE 488	WASTE MANAGEMENT
5	CE 460	GROUND IMPROVEMENT	5	CE 490	MASS RAPID TRANSPORT SYSTEMS
6	CE 462	ENERGY EFFICIENT BUILDINGS	6	CE 492	WATER RESOURSES PLANNING AND MANAGEMENT
7	CE 464	WATER POWER ENGINEERING	7	CE 494	DESIGN OF MASONRY
8	CE 466	ENVIRONMENTAL IMPACT ASSESSMENTS	8	CE 496	BRIDGE ENGINEERING

 # List of Departmental Elective – III

Note:

Students will be permitted to opt for any one elective from each grouprun by the Department. However, the Department shall offer those electives forwhich 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.

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: Elements Of Earthquake Engineering (Theory) **Subject Code: CE-402B**

Detailed Content

Unit No.1 Introduction, Theory of Vibrations

Topic No.1 : Introduction to various disasters
Topic No.2 : Disaster Management, Nature of dynamic loads
Topic No.3 : Earthquake, wind and blast loads, characteristics of dynamic problems
Topic No.4 : Method of discretization, Formulation of Equation of Motions
Topic No.5 : Free and forced vibrations of single degree of freedom systems, damping and its effects
Topic No.6 : Transient vibration, response spectrum theory
Topic No.7 : Review of formulation of flexibility and stiffness matrices of framed structures, application of vibration theory

Unit No.2 Multi-degree of freedom systems, Seismic performance, repair and strengthening

Topic No.8 : Mode shapes and frequencies, numerical techniques for finding modes shapes and corresponding frequencies
Topic No.9 : Orthogonality relationship of principal modes
Topic No.10: Determination of fundamental frequency, Rayleigh's principle and its applications
Topic No.11: Normal mode theory for forced vibration, analysis of multi-degree freedom system
Topic No.12: Dynamic response by mode superposition method
Topic No.13: Vibration of continuum system, free and forced vibration response
Topic No.14: Identification of Seismic damage in RC Buildings, effect of structural irregularities on performance
Topic No.15: Criteria for repair and strengthening, various techniques and their applications
Topic No.16: Seismic resistant building Architecture.

Unit No.3 Introduction to Structural Failures due to Earthquake

Topic No.17: Seismic analysis and design of OHSR's
Topic No.18: Framed structures by equivalent lateral load procedure and Modal analysis

Unit No.4 Introduction to Ductile Detailing

Topic No.19: Introduction to Ductile Detailing of Structures,
Topic No.20: Concept of Soft Story Shear Walls
Topic No.21: Use of Codes with reference to Masonry Buildings like IS: 4326, IS: 13828, IS: 13827

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT BOOKS:

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.

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.

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: Irrigation Engineering II (Theory) **Subject Code: CE-404B**

Detailed Content

Unit No.1 Regulation works, Cross Drainage Works

Topic No.1 : Canal falls-necessity and location, development of falls
Topic No.2 : Design of cistern element, roughening devices
Topic No.3 : Design of Sarda type fall. Design of straight Glacis fall.
Topic No.4 : Off-take alignment, Cross-Regulator and Distributory Head Regulators.
Topic No.5 : Devices to control silt entry into the off-taking channel and Silt Ejector
Topic No.6 : Canal Escapes
Topic No.7 : Classification and their selection
Topic No.8 : Hydraulic Design Aspects of Aqueducts
Topic No.9 : Syphon Aqueducts, Super Passage, Canal Syphon and Level Crossing

Unit No.2 Diversion Canal Headworks

Topic No.10: Various components and their functions
Topic No.11: Layout plan, selection of site for diversion headworks
Topic No.12: Causes of failure of weir/barrages on permeable foundation
Topic No.13: Bligh's creep theory, Khosla's method of independent variables
Topic No.14: Use of Khosla's curves, various corrections

Unit No.3 Storage Headworks

Topic No.15: Types of dams, selection of a site, gravity dam-two dimensional analysis
Topic No.16: Forces acting, stability criterion, elementary profile of a dam
Topic No.17: Grout Curtain and drainage galleries, Arch dams
Topic No.18: Constant angle and constant radius arch dam, simple design and sketchs
Topic No.19: Most economical angle. Earth dam, design principles
Topic No.20: Seepage through earth dams, seepage line
Topic No.21: Control of seepage, design of filters

Unit No.4 Spillways and Energy Dissipators

Topic No.22: Requirements of spillway and spillway capacity
Topic No.23: Types of spillways and their suitability
Topic No.24: Design aspects of Ogee spillways, chute, side channel
Topic No.25: Shaft and syphon spillways, Energy dissipation below spillways
Topic No.26: Stage discharge and jump height curves
Topic No.27: Stilling basins, USBR and I.S. Stilling Basins for different Froude no. ranges
Topic No.28: Design of stilling basins.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	2	-	5	25	75	3 hours	100

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.

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: Human Values, Ethics & IPR (Theory) **Subject Code: MGT-402**

Detailed Content

Unit No.1 Introduction, Engineering Ethics

Topic No.1 : Role of Engineer in Nation Building and in service of mankind
Topic No.2 : Senses of 'Engineering Ethics' - variety of moral issues
Topic No.3 : types of inquiry - moral dilemmas
Topic No.4 : moral autonomy Kohlberg's theory -Gilligan's theory
Topic No.5 : consensus and controversy - professions and professionalism professional ideals and virtues
Topic No.6 : theories about right action - self-interest-customs and religion - uses of ethical theories.

Unit No.2 Human Values, Engineering as Social Experimentation

Topic No.7 : Morals, Values and Ethics – Integrity – Work Ethic
Topic No.8 : Service Learning – Civic Virtue
Topic No.9 : Respect for Others – Living Peacefully – caring – Sharing
Topic No.10: Honesty – Courage – Valuing Time – Co-operation
Topic No.11: Commitment – Empathy – Self-Confidence – Character – Spirituality
Topic No.12: Engineering as experimentation - engineers as responsible experimenters
Topic No.13: codes of ethics-a balanced outlook on law-the challenger case study

Unit No.3 Engineer's Responsibility for Safety, Responsibilities

Topic No.14: Safety and risk - assessment of safety and risk
Topic No.15: risk benefit analysisreducing risk
Topic No.16: the three mile island and Chernobyl case studies
Topic No.17: Collegiality and loyalty
Topic No.18: respect for authority - collective bargaining
Topic No.19: confidentiality - conflicts of interest, occupational crime

Unit No.4 Rights, Global Issues

Topic No.20: employee rights - intellectual property rights (IPR)
Topic No.21: discrimination, Arbitration and litigations
Topic No.22: Multinational corporations - environmental ethics
Topic No.23: computer ethics-weapons development
Topic No.24: developmentengineers as managers-consulting engineers
Topic No.25: advisors-moral leadershipsample code of conduct.

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Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	2	-	5	25	75	3 hours	100

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.

REFERENCE BOOKS:

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.

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: Water Power Engineering **Subject Code: CE-464B**

Detailed Content

Unit No.1 Introduction, Types of Hydro Power Plants

Topic No.1 : Sources of power , estimation of water power
Topic No.2 : Necessity and importance of harnessing small hydro power
Topic No.3 : Flow duration and power duration curves
Topic No.4 : Load curve, load factors, capacity factors
Topic No.5 : Utilisation factors, firm and secondary power
Topic No.6 : Elements of Hydro power, classification of hydro-power plants
Topic No.7 : Runof- river plants, storage plants diversion canal development
Topic No.8 : Pumped storage plants, tidal power plants
Topic No.9 : Base load and peak load plants in a power grid

Unit No.2 Intakes:

Topic No.10: Intake structures, functions and their types
Topic No.11: Components of intakes-forebay, trash racks
Topic No.12: Gates and valves, force required to operate gates

Unit No.3 Conveyance System

Topic No.13: Penstocks, design criterion, economical diameter anchor blocks
Topic No.14: Cradles and footings, water hammer
Topic No.15: Instantaneous closure of power canal
Topic No.16: Surge tank, surges in canals.

Unit No.4 Turbines, Power House

Topic No.17: Types of turbines, specific speed and classification of turbines
Topic No.18: Synchronous speed, scroll casing
Topic No.19: Flumes and draft tubes, dimensions of scroll casing and draft tubes
Topic No.20: Setting of turbines
Topic No.21: General layout and arrangements of hydro-power units
Topic No.22: Number and size of units
Topic No.23: Sub-structure, spacing of units
Topic No.24: Super-structure, underground power stations, tidal power

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

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

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: Waste Management **Subject Code: CE-488B**

Detailed Content

Unit No.1 Types of Industrial Waste, Solid wastes, non-hazardous wastes and hazardous wastes

- Topic No.1 : Liquid, solid, atmospheric and hazardous
- Topic No.2 : Hazardous wastes: Characterization and treatment
- Topic No.3 : Definition, sources and characteristics
- Topic No.4 : Sampling and analysis techniques; Inventorying wastes
- Topic No.5 : Strategies for source reduction
- Topic No.6 : For the recovery of residual substances
- Topic No.7 : Byproducts and resources and for recycling and reuse of wastes

Unit No.2 Municipal solid waste management, Treatment and disposal

- Topic No.8 : Segregation and recycling and reuse of wastes; Collection
- Topic No.9 : Transportation and storage of municipal solid waste
- Topic No.10: Resource recovery from wastes; waste exchanges
- Topic No.11: Municipal solid waste management programs
- Topic No.12: Biological and chemical treatment of hazardous wastes
- Topic No.13: Composting and vermi-composting of wastes.

Unit No.3 Solidification and stabilization

- Topic No.14: Solidification and stabilization of wastes
- Topic No.15: Incineration for the treatment and disposal of municipal solid wastes and hazardous wastes
- Topic No.16: Land farming; Landfill disposal of municipal solid waste and hazardous waste; and Bioremediation

Unit No.4 Legal requirements

- Topic No.17: Electronic waste Management
- Topic No.18: Municipal solid waste rules; Hazardous waste rules
- Topic No.19: Biomedical waste rules; Rules related to recycled plastics
- Topic No.20: Used batteries, flyash, etc

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

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. INSDOCUNESCO, 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.

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: Irrigation Engineering - II Lab **Subject Code: CE-406B**

Detailed Content

List of Experiments:

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.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	3	1.5	20	30	3 hours	50

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

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: Project **Subject Code: CE-408B**

Detailed Content

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.

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	8	8	75	125	3 hours	200

SYLLABUS: B Tech (CE)

Department: Civil Engineering – 8th Semester

Subject: General Fitness For The Profession **Subject Code: GFCE – 402**

Detailed Content

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)**

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)

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
-	-	-	4	-	100	-	100