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 - II	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 – 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	3
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 453	PRE-STRESSED CONCRETES	5	CE 461	ROCK MECHANICS
2	CE 455	CONSTRUCTION METHODS AND EQUIPMENTS	6	CE 463	INDUSTRIAL WASTE MANAGEMENT
3	CE 457	SOIL EXPLORATION AND TESTING	7	CE 465	GROUND WATER ENGINEERING
4	CE 459	ADVANCED DESIGN OF CONCRETE STRUCTURES	8	CE 467	SYSTEM DEISGN TECHNIQUES
			9	CE469	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

CE- 401B PROJECT PLANNING AND MANAGEMENT
B. Tech. 4TH Year (Semester – VII)

L	T	P	Credits				
				Class Work	:	25 Marks	
3	1	--	4	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			
				Class Work	:	25 Marks
3	2	--	5	Examination	:	75 Marks
				Total	:	100 Marks
				Duration of Examination	:	4 Hours

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, analysis, plastIc analysis applied to steel beams and simple portal frames and design.

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

UNIT II

Design of Water Tanks: Introduction, permissible stresses, design of circular, rectangular and pressed steel tanks including staging

UNIT III

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

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

UNIT IV

Cold Formed Sections: Introduction and brief description of various type of cold formed sections, local buckling, concepts of effective width and effective sections, elements with stiffeners, design of compression and bending elements.

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.
2. 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- 405 B IRRIGATION ENGINEERING I

B. Tech. 4TH Year (Semester – VII)

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

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CE 407 B ESTIMATING AND COSTING
B. Tech. 4th Year (Semester – VII)

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

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CE 409 B IRRIGATION ENGINEERING LAB I
B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
				Class Work	:	20Marks
-	-	2	1	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		Class Work	: 100 Marks
--	--	4	4			

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		Class Work	:	50Marks
-	-	2	2		Examination	:	50Marks
					Total	:	100 Marks
					Duration of Examination	:	3hrs

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.

CE41
5   PROFESSIONAL TRAINING
B. Tech. Semester – VII (Civil Engineering)

L	T	P	Credits		Class Work		50 Marks
--	--	2	2		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		
				Class Work	: Marks 25
4	-	--	4	Examination	: Marks 75
				Total	: Marks 100
				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.
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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, 1**

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ECE 305B CONSUMER ELECTRONICS

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

L	T	P	Credits			
				Class Work	:	25 Marks
4	-	--	4	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.

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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:
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EE451B ENERGY AUDIT

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

L	T	P	Credits			
				Class Work	:	25 Marks
4	-	--	4	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

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EEE457B ENERGY RESOURCES & TECHNOLOGY

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

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

BT401B: BIOINFORMATICS
B. Tech. Semester – VII (Civil Engineering) – Open Elective

L T P Credits		Class Work : Marks	25
3 1 - 4		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: In the semester examination, the examiner will set 08 questions in all, selecting two from each unit. The candidates will be required to attempt five questions in all, selecting at least one from each unit. All questions will carry equal marks.

AE 417B MODERN VEHICLE TECHNOLOGY

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

L	T	P	Credits			
				Class Work	:	25 Marks
4	-	--	4	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:

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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.

CE451B POLLUTION & CONTROL
B. Tech. Semester – VII (Civil Engineering) – Open Elective

L	T	P	Credits			
				Class Work	:	Marks 25
4	-	--	4	Examination	:	Marks 75
				Total	:	Marks 100
				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			
				Class Work	:	25 Marks
4	-	--	4	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.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CSE 451B   CYBER SECURITY

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

L	T	P	Credits			
				Class Work	:	25 Marks
4	-	--	4	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:

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· "Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal
Perspectives", Nina Godbole, Sunit Belapur, Wiley India Publications, April, 2011

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 453B PRESTRESSED CONCRETE
B. Tech. 4th Year (Semester – VII)

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

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

CE 455B CONSTRUCTION METHODS AND EQUIPMENTS
B. Tech. 4th Year (Semester – VII)

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

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 457B SOIL EXPLORATION AND TESTING
B. Tech. 4th Year (Semester – VII)

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

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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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 459B ADVANCED DESIGN OF CONCRETE STRUCTURES
B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
				Class Work	:	25 Marks
3	1	--	4	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.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

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CE 461B ROCK MECHANICS
B. Tech. 4th Year (Semester – VII)

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

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CE 463B INDUSTRIAL WASTE MANAGEMENT
B. Tech. 4th Year (Semester – VII)

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

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.

9
1

CE 465B GROUND WATER ENGINEERING
B. Tech. 4ᵗʰ Year (Semester – VII)

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

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.

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2

CE 467B SYSTEM DEISGN TECHNIQUES
B. Tech. 4th Year (Semester – VII)

L	T	P	Credits			
				Class Work	:	25 Marks
3	1	--	4	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.**

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3

CE - 469 TRAFFIC ENGINEERING
B. Tech. 4th Year (Semester – VII)

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