Course of Study and Scheme of Examination
B.E. Civil Engineering (New)
SEMESTER – VIII

S.No	Course Category	Course Code (New)	Subject	Period Per Week				Distribution of Marks					
								Theory Exam	Practical Exam	Internal Assessment			Total
										MST	TW		
				L	T	P	C	I	II	III		Total	I+II+III
1.	DC-24	CE-801	Geo. Technical Engg. II	3	1	2	6	100	50	20	30	50	**200**
2.	DC-25	CE-802	Construction Planning & Management	3	1	0	4	100	-	20	-	20	**120**
3.	DC-26	CE-803	Advanced Structural Design-II (Steel)	3	1	2	6	100	50	20	30	50	**200**
4.	DC-27	Refer Table Below	Elective –II	3	1	0	4	100	-	20	-	20	**120**
5.	DC-28	CE-805	Major Project	0	0	8	8	-	150	-	110	110	**260**
6.	NECC-11	CE-806	General Proficiency	0	0	4	4	-	50	-	50	50	**100**
Total				**12**	**4**	**16**	**32**	**400**	**300**	**80**	**220**	**300**	**1000**

Minimum Pass Marks
(A) Theory : 35 Percent
(B) Practical : 50 Percent

Duration
(C) Duration of Theory Paper 3 hrs.

Elective - II :

CE-8201	Structural Dynamics & Earthquake Engineering
CE-8202	Pavement Design
CE-8203	Air Quality Monitoring & Control
CE-8204	Energy Efficient & Green Building
CE-8205	Design of Prestrassed Conc. Structure
CE-8206	Water Power Engineering
CE-8207	Advance Water Resources Energy

Course Contents

Category of Course	Course Title	Course Code	Credits-6C			Theory Papers (ES)
Civil Engineering Department DC-24	Geo Tech. Engg. - II	CE801	L	T	P	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	2	

Branch: Civil Engineering-VIII Semester
Course: CE801 Geo Tech. Engg. - II

Unit - I

Shallow Foundations : Type of foundations shallow and deep. Bearing capacity of foundation on cohesion less and cohesive soils. General and local shear failures. Factors effecting B.C. Theories of bearing capacity - Prandle, Terzaghi, Balla, Skempton, Meyerh of and Hansan. I.S. code on B.c. Determination of bearing capacity. Limits of total and differential settlements. Plate load test.

Unit - II

Deep Foundation : Pile foundation, Types of piles, estimation of individual and group capacity of piles in cohesion less and cohesive soils. Static and dynamic formulae.. Pile load test, Settlement of pile group, Negative skin friction, under- reamed piles and their design. Piles under tension, inclined and lateral load
Caissons. Well foundation. Equilibrium of wells. Analysis for stability tilts and shifts, remedial measures.

Unit - III

Soil Improvement Techniques : Compaction. Field and laboratory methods, Proctor compaction tests, Factors affecting compaction. Properties of soil affected by compaction. Various equipment for field compaction and their suitability. Field compaction control. Lift thickness.
Soil stabilisation : Mechanical, Lime, Cement, Bitumen, Chemical, Thermal, Electrical-stabilisation and sabilisation by grouting. Geo-synthetics, types, functions, materials and uses.

Unit - IV

Soil Exploration and Foundations on Expansive and Collapsible soils : Methods of soil exploration. Planning of exploration programme for buildings, highways and earth dams. Disturbed and undisturbed samples and samplers for collecting them.
Characteristics of expansive and collapsible soils, their treatment, Construction techniques on expansive and collapsible soils. CNS layer.

Unit - V

Sheet piles/Bulkheads and Machine foundation : Classification of sheet piles/bulkheads. Cantilever and anchored sheet piles, Cofferdams, materials, types and applications.
Modes of vibration. Mass-spring analogy, Natural frequency. Effect of vibration on soils. Vibration isolation. Criteria for design. Design of block foundation for impact type of machine.
LABORATORY WORK: Laboratory work will be based on the course of Geotech. Engg. I & II as required for soil investigations of engineering projects and not covered in the lab. Work of Geotech. Engg. I.

LIST OF EXPERIMENTS

1. Indian Standard Light Compaction Test/Std. Proctor Test
2. Indian Standard Heavy Compaction Test/Modified Proctor Test
3. Determination of field density by Core Cutter Method
4. Determination of field density by Sand Replacement Method
5. Determination of field density by Water Displacement Method
6. The corifiled Compression Test
7. Triaxial compression test
8. Lab. Vane Shear test
9. CBR Test
10. Demonstration of
    - Plate Load Test
    - SPT & DCPT

Reference Books :--

1. Soil Mechanics & Foundation Engg. by Dr. K.R. Arora - Std. Publishers Delhi
2. Soil Mechanics & Foundation Engg. by B.C. Punmia - Laxmi Publiscations Delhi
3. Modern Geotech. Engg. by Dr. Alam Singh-IBT Publishers Delhi.
4. Geotech. Engg. by C.Venkatramaiah-New AGe International Publishers, Delhi
5. Found. Engg. by GALeonards McGraw Hill Book Co. Inc.
6. Relevant IS Code

Course Contents

Category of Course	Course Title	Course Code	Credits-4			Theory Papers (ES)
Civil Engineering Department DC-25	Construction Planning & Management	**CE802**	**L**	**T**	**P**	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	0	

Branch: Civil Engineering-VIII Semester
Course: CE802 Construction Planning & Management

Unit -I
Preliminary and detailed investigation methods: Methods of construction, form work and centering. Schedule of construction, job layout, principles of construction management, modern management techniques like CPM/PERT with network analysis.

Unit -II
Construction equipments: Factors affecting selection, investment and operating cost, output of various equipments, brief study of equipments required for various jobs such as earth work, dredging, conveyance, concreting, hoisting, pile driving, compaction and grouting.

Unit -III
Contracts: Different types of controls, notice inviting tenders, contract document, departmental method of construction, rate list, security deposit and earnest money, conditions of contract, arbitration, administrative approval, technical sanction.

Unit -IV
Specifications & Public Works Accounts: Importance, types of specifications, specifications for various trades of engineering works.
Various forms used in construction works, measurement book, cash book, materials at site account, imprest account, tools and plants, various types of running bills, secured advance, final bill.

Unit-V
Site Organization & Systems Approach to Planning: Accommodation of site staff, contractor's staff, various organization charts and manuals, personnel in construction, welfare facilities, labour laws and human relations, safety engineering.
Problem of equipment management, assignment model, transportation model and waiting line modals with their applications, shovel truck performance with waiting line method.

Reference Books :-

1. Construction Equipment by Peurify
2. CPM by L.S. Srinath
3. Construction Management by S. Seetharaman
4. CPM & PERT by Weist & Levy
5. Construction, Management & Accounts by Harpal Singh
6. Tendering & Contracts by T.A. Talpasai

Course Contents

Category of Course	Course Title	Course Code	Credits-6			Theory Papers (ES)
Civil Engineering Department DC-26	Advanced Structural Design-II (Steel)	**CE803**	**L**	**T**	**P**	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			3	1	2	

Branch: Civil Engineering-VIII Semester
Course: CE803 Advanced Structural Design- II (Steel)

Unit – I
Plate girder bridges (Riveted and welded)
Unit – II
Trussed girder bridges for railways and highways (IRC & IRS holding). Bearings for bridges.
Unit – III
Water Tanks: Pressed steel tanks, tanks with ordinary plates, square, rectangular, circular with hemispherical bottom and conical bottom.
Unit - IV
Chimneys: Guyed and self supporting steel stacks.
Unit – V
Bunkers, Silos & Towers

Reference Books :-

1. Design of Steel Structures – Ramammutham
2. Design of Steel Structures – Punia
3. Steel Str. by Ramchandra Vol II
4. Steel Str. by Arya & Ajmani
5. Design of steel structures – L.S. Negi

Course Contents

Category of Course	Course Title	Course Code	Credits-8			Theory Papers (ES)
Civil Engineering Department DC-28	Major Project - I	**CE805**	**L**	**T**	**P**	Max.Marks-100 Min.Marks-35 Duration-3hrs.
			0	0	8	

Branch: Civil Engineering-VIII Semester
Course: CE805 Major Project - I

Each candidate shall work on an approved Civil Engg. Project and shall submit design and a set of drawings on the project.

CE-8201 STRUCTURAL DYNAMICS & EARTHQUAKE ENGINEERING

Unit - I.

Single DOF systems - Undamped and Damped, Response to Harmonic and periodic excitations, Response to Arbitrary, Step, Ramp and Pulse Excitations.

Unit - II.

Numerical Evaluation of Dynamic Response - Time stepping methods, methods based an Interpolation of Excitation, Newmark's and Wilson - q method, Analysis of Nonlinear Response, Introduction to frequency domain analysis.

Unit - III.

Elements of seismology - Definitions of the basic terms related to earthquake (magnitude, intensity, epicenter, focus etc.), seismographs

Earthquake Response of structures - Nature of dynamic loading resulting from earthquake, construction of Response spectrum for Elastic and Inelastic systems.

Unit - IV.

Multiple DOF systems : Stiffness and Flexibility matrices for shear buildings, free and forced vibrations-undamped and damped, Modal and Response History Analysis, Systems with distributed mass & elasticity.

Unit - V.

Earthquake Resistant Design of Structures, Design of structures for strength & servicability, Ductility and energy absorption, Provisions of IS : 1893 and IS : 4326 for aseismic design of structures, Code for ductile detailing IS : 13920.

Reference Books :--

1. Chopra A.K., Dynamics of structures - Theory and Applications to Earthquake Enginering,Prentice Hall of India, New Delhi.
2. Berg G.V. Elements of Structural Dynamics, Prentice Hall of India, Englewood Cliffs, NJ
3. Paz Mario, Structural Dynamics, CBS Publishers, Delhi
4. Clough R.W. & Penzien J., Dynamics of structures McGraw Hill, New York.

CE-8202 PAVEMENT DESIGN

Unit -I.

Equivalent Single Wheel Load (ESWL) : Definition, calculation of ESWL, repetition of loads and their effects on the pavement structures.

Unit -II.

Flexible Pavements : Component parts of the pavement structures and their functions, stresses in flexible pavements, Stress distribution through various layers, Boussinesque's theory , Burmister's two layered theory, methods of design, group index method, CBR method, Burmister's method and North Dakota cone method.

Unit -III.

Rigid Pavements : Evaluation of subgrade, Modulus-K by plate bearing test and the test details, Westergaard's stress theory stresses in rigid pavements, Temperature stresses, warping stresses, frictional stresses, critical combination of stresses, critical loading positions.

Unit -IV.

Rigid pavement design : IRC method, Fatigue analysis, PCA chart method, joints, design and construction & types, AASHTO Method, Reliability analysis.

Unit -V.

Evaluation and Strengthening of Existing Pavements : Benkleman beam method, Serviceability Index Method. Rigid and flexible overlays and their design procedures.

Reference Books :--

1. Principles of pavement design by E.J.Yoder & M.W. Witczak
2. AASHO, "AASHO Interim Guide for Design of Pavement Structures", Washington, D.C.
3. Portland Cement Association, Guidlines for Design of Rigid Pavements, Washington
4. DSIR, Conc. Roads Design & Construction
5. Srinivasan M. "Modern Permanent Way"

CE-8203 AIR QUALITY MONITORING & CONTROL

Unit - I

Air pollution problem: Economics and social aspects, historical episodes of air pollution. Sources of Air pollution, effects of air pollution on health, animal, plants and materials

Unit - II

Role of meteorological condition, properties of typical air pollutants, air diffusion and concentration pollutants. general diseases caused by air pollutants. toxicity of various pollutants. Plums patterns and height of chimneys.

Unit - III

Atmospheric chemistry, formation of secondary pollutants – PNN, PBN, Photolytic cycles, general diseases and toxicity of pollutants

Unit - IV

Sampling and Analyzing of Air Pollutants: Instruments pollution survey, standards of air pollution.
Principle of air pollution control, site selection and zoning, various control methods, process and equipment changes, design and operation of various air pollution control equipments.

Unit - V

Air pollution control legislation, public education pollution standards, status of air pollution control in various countries.
Industrial Hygiene: Concept and importance, factory Involved in environmental hazards, industrial ventilation occupational diseases, control methods.

Reference Books :--

1. "Air Pollution" - Faith W.L, John Wiley & Sons
2. "Air Pollution" - Mc Cabe L.C., Mc. Graw Hill, International
3. Air Pollution - Stern A.C., Academic Press N. York
4. Fundamentals of Air Pollutions - Raju BSN Oxford & IBH Publishing Co. Pvt. Ltd.
5. "Air Pollution" - Rao M.N. & Rao HVN - Tata Mc Graw Hill
6. Air Pollution – Wark and Warner

CE-8207 ADVANCE WATER RESOURCES ENGINEERING.

Unit-I

Hydrology : Hydrological cycle, precipitation and its measurement, recording and non recording rain gauges, estimating missing rainfall data, rain gauge net works, mean depth of precipitation over a drainage area, mass rainfall curves, intensity-duration curves, depth-area duration curves,

Unit-II

Hydrology : Infiltration and infiltration indices, evaporation stream gauging, run off and its estimation, hydrograph analysis, unit hydrograph and its derivation from isolated and complex storms, S-curve hydrograph, synthetic unit hydrograph.

Unit-III

Floods : Types of floods and their estimation by different methods, probability and frequency analysis, flood routing through reservoirs and channels, flood control measures, economics of flood control.

Unit-IV

Ground water : Occurrence, confined and unconfined aquifers, aquifer properties, hydraulics of wells under steady flow conditions, infiltration galleries. Ground water recharge-necessity and methods of improving ground water storage.

Water logging and salt efflorescence : Water logging-causes, effects and its prevention. Salt efflorescence-causes and effects. reclamation of water logged and salt affected lands.

Unit-V

Water resources planning and management : Planning of water resources projects, data requirements, economic analysis of water resources projects appraisal of multipurpose projects, optimal operation of projects-introduction to linear programming and its application to water resources projects. Role of water in the environment, rain water harvesting, impact assessment of water resources development and managerial measures.

Suggested Books :-

1. Engg. Hydrology - J.NEMEC - Prentice Hall
2. Hydrology for Engineers Linsley, Kohler, Paulnus - Tata Mc.Graw Hill.
3. Engg. Hydrology by K. Subhramanya - Tata Mc Graw Hills Publ. Co.
4. Hydrology & Flood Control by Santosh Kumar - Khanna Publishers
5. Engg. Hydrology by H.M. Raghunath