

**GOVT. COLLEGE OF
ENGINEERING,
AMRAVATI**



**CURRICULUM
B. TECH. (CIVIL ENGG.)
V and VI Semester**

Department of Civil Engineering

ANNEXURE B - REVISED CURRICULUM STRUCTURE OF B. TECH. CIVIL ENGINEERING - 2012

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI.

Department of Civil Engineering.

B. Tech. (Civil Engineering)

SEM III

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme						Credits	
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical			Total
						TA	CT1	CT2	ESE	ICA	ESE		
SHU301	Engineering Mathematics-III	3	--	---	3	10	15	15	60	---	---	100	3
CEU301	Engineering Geology & Hydrology	3	---	---	3	10	15	15	60	---	---	100	3
CEU302	Fluid Mechanics	3	1	---	4	10	15	15	60	---	---	100	4
CEU303	Strength of Materials	3	1	---	4	10	15	15	60	---	---	100	4
CEU304	Building Construction & Materials	3	---	---	3	10	15	15	60	---	---	100	3
SHU305	General Proficiency II	1	---	2	3	---	---	---	---	25	25	50	2
CEU305	Engineering Geology & Hydrology Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU306	Fluid Mechanics Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU307	Strength of Materials Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU308	Building Construction & Materials Lab	---	---	2	2	---	---	---	---	25	25	50	1
Total		16	2	10	28	50	75	75	300	125	125	750	23

TA :Teacher Assessment CT: Class Tests ESE: End Semester Examination ICA : Internal Continuous Assessment

Note: The ESE duration for all theory courses shall be 2 hrs. 30 min.

SEM IV

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme						Credits	
		Theory Hrs /week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical			Total
						TA	CT1	CT2	ESE	ICA	ESE		
CEU401	Engineering Economics & Humanities	3	--	---	3	10	15	15	60	---	---	100	3
CEU402	Transportation Engineering	3	1	---	4	10	15	15	60	---	---	100	4
CEU403	Surveying	3	1	---	4	10	15	15	60	---	---	100	4
CEU404	Concrete Technology	3	---	---	3	10	15	15	60	---	---	100	3
CEU405	Open Channel Flow & Hydraulic Machines	3	1	---	4	10	15	15	60	---	---	100	4
CEU406	Transportation Engineering Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU407	Surveying Lab	---	---	4	4	---	---	---	---	50	50	100	2
CEU408	Concrete Technology Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU409	Open Channel Flow & Hydraulic Machines Lab	---	---	2	2	---	---	---	---	25	25	50	1
Total		15	3	10	28	50	75	75	300	125	125	750	23

TA :Teacher Assessment CT: Class Tests ESE: End Semester Examination ICA : Internal Continuous Assessment

Note: The ESE duration for all theory courses shall be 2 hrs. 30 min.

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Revised curriculum B. Tech. (Civil Engineering) - 2012

SEM V

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	ICA	ESE		
CEU501	Theory of Structures	3	1	---	4	10	15	15	60	---	---	100	4
CEU502	Design of Steel Structures	3	1	---	4	10	15	15	60	---	---	100	4
CEU503	Building Design & Drawing	2	---	---	2	10	15	15	60	---	---	100	2
CEU504	Advanced Surveying	3	---	---	3	10	15	15	60	---	---	100	3
CEU505	Water Treatment Process & Technology	3	---	---	3	10	15	15	60	---	---	100	3
CEU506	Design of Steel Structures Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU507	Building Design & Drawing Lab	---	---	4	4	---	---	---	---	50	25	75	2
CEU508	Advanced Surveying Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU509	Water Treatment Process & Technology Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU510	Self Study-I	---	---	---	---	25	---	---	---	---	---	25	2
Total		14	2	10	26	75	75	75	300	125	100	750	23

Note: The ESE duration for all theory courses shall be 2 hrs. 30 min. except course CEU502 and CEU503 for which the ESE duration will be 3 hrs.

Self study-I is based on one class test each, on the basis of 20% curriculum of the courses CEU501, CEU503, CEU504 and CEU505 to be declared by respective course coordinator at the beginning of the semester.

One faculty member shall be appointed as course coordinator for Self Study I and his/ her teaching work load shall be considered as one hr/week.

SEM VI

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	ICA	ESE		
CEU601	Design of Reinforced Concrete Structures	3	--	---	3	10	15	15	60	---	---	100	3
CEU602	Geotechnical Engineering	3	---	---	3	10	15	15	60	---	---	100	3
CEU603	Water Resources Engineering	3	---	---	3	10	15	15	60	---	---	100	3
CEU604	Construction Management	3	---	---	3	10	15	15	60	---	---	100	3
CEU605	Estimating & Costing	3	---	---	3	10	15	15	60	---	---	100	3
CEU606	Design of Reinforced Concrete Structures Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU607	Geotechnical Engineering Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU608	Water Resource Engineering Lab	---	---	2	2	---	---	---	---	25	-	25	1
CEU609	Estimating & Costing Lab	---	---	2	2	---	---	---	---	25	-	25	1
CEU610	Minor Project	---	---	2	2	---	---	---	---	25	25	50	2
CEU611	Self Study-II	---	---	---	---	25	---	---	---	---	---	25	2
CEU612	Industrial Lecture-I*	1	---	---	1	---	---	---	---	---	---	---	---
Total		16	0	10	26	75	75	75	300	125	75	725	23

TA :Teacher Assessment CT: Class Tests ESE: End Semester Examination ICA : Internal Continuous Assessment

Note: The ESE duration for all theory courses shall be 2 hrs. 30 min. except course CEU601 and CEU605 for which the ESE duration will be 3 hrs.

*** Credits shall be awarded on the basis of combined assesment of CEU612 and CEU710.**

Self study-II is based on one class test each, on the basis of 20% curriculum of the courses CEU601, and CEU602, CEU603, CEU604 to be declared by respective course coordinator at the beginning of the semester.

One faculty member shall be appointed as course coordinator for Self Study II and his/ her teaching work load shall be considered as one hr/week.

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SEM VII

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	ICA	ESE		
CEU701	Advanced Theory of Structures	3	---	---	3	10	15	15	60	---	---	100	3
CEU702	Foundation Engineering	3	---	---	3	10	15	15	60	---	---	100	3
CEU703	Elective-I	3	---	---	3	10	15	15	60	---	---	100	3
CEU704	Interdisciplinary Elective	3	---	---	3	10	15	15	60	---	---	100	3
CEU705	Advanced Theory of Structures Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU706	Foundation Engineering Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU707	Software in Civil Engg Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU708	Project-Phase-I	---	---	4	4	---	---	---	---	100	---	100	2
CEU709	Industrial Visit/ Training	---	---	---	---	---	---	---	---	50	---	50	2
CEU710	Industrial Lecture-II*	1	---	---	1	---	---	---	---	25	---	25	1
CEU711	Self Study-III	---	---	---	---	25	---	---	---	---	---	25	2
CEU712	Seminar	---	---	---	---	---	---	---	---	25	---	25	1
Total		13	0	10	23	65	60	60	240	275	75	775	23

Note: The ESE duration for all theory courses shall be 2 hrs. 30 min. except course CEU701 for which the ESE duration will be 3 hrs.
Students of this department shall select any one Interdisciplinary Elective offered by other department. Interdisciplinary Elective shown below will be offered to students of other department.

*** Credits shall be awarded on the basis of combined assesment of CEU612 and CEU710.**

Self study-III is based on one class test each, on the basis of 20% curriculum of the courses CEU701, CEU702 and CEU703 to be declared by respective course coordinator at the beginng of the semester.

One faculty member shall be appointed as course coordinator for Self Study III and his/ her teaching work load shall be considered as one hr/week.

SEM VIII

Course Code	Name of the Course	Teaching Scheme				Evaluation Scheme							Credits
		Theory Hrs/week	Tutorial Hrs/week	Practical Hrs/week	Total	Theory				Practical		Total	
						TA	CT1	CT2	ESE	ICA	ESE		
CEU801	Advanced Structural Design	2	---	---	2	10	15	15	60	---	---	100	2
CEU802	Environmental Engineering	3	---	---	3	10	15	15	60	---	---	100	3
CEU803	Elective -II	3	---	---	3	10	15	15	60	---	---	100	3
CEU804	Elective -III	3	---	---	3	10	15	15	60	---	---	100	3
CEU805	Advanced Structural Design Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU806	Environmental Engineering Lab	---	---	2	2	---	---	---	---	25	25	50	1
CEU807	Elective -II Lab	---	---	2	2	---	---	---	---	25	---	25	1
CEU808	Elective -III Lab	---	---	2	2	---	---	---	---	25	---	25	1
CEU809	Project	---	---	6	6	---	---	---	---	75	100	175	6
CEU810	Self Study-IV	---	---	---	---	25	---	---	---	---	---	25	2
Total		11	0	14	25	65	60	60	240	175	150	750	23

TA :Teacher Assessment CT: Class Tests ESE: End Semester Examination ICA : Internal Contineous Accessment

Note: The ESE duration for all theory courses shall be 2 hrs. 30 min. except course CEU801 for which the ESE duration will be 3 hrs.

Self study-IV is based on one class test each, on the basis of 20% curriculum of the courses CEU801, CEU802, CEU803 and CEU804 to be declared by respective course coordinator at the beginng of the semester.

One faculty member shall be appointed as course coordinator for Self Study IV and his/ her teaching work load shall be considered as one hr/week.

Electives

CEU703 Elective-I	CEU704 Interdisciplinary Elective	CEU803 Elective-II	CEU804 Elective-III
A) Advanced Structural Analysis	A) Optimization and Modeling	A) Structural Dynamics	A) Hydraulic Structures
B) Advanced Soil Mechanics	B) Industrial Building Planning & Design	B) Earthquake Resistant Design	B) Advanced Design of Steel Structure
C) Matrix Analysis of Structures	C) Interior Designs & Drawing	C) Pavement Design & Construction	C) Finite Element Method
D) Environmental Pollution & Solid Waste Management	D) Project Management	D) Advanced Wastewater Treatment	D) Ground Improvement Technology
E) Railways, Tunnels & Airport Engineering	E) System Engineering	E) Advanced Foundation Engineering	E) Remote Sensing & GIS
F) Advanced Fluid Mechanics		F) Advanced Construction Management	F) Advanced Water Treatment Process & Technology

CEU 501- THEORY OF STRUCTURES

Teaching Scheme: 03 L + 01 T Total: 04 Credits: 04
Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE Total Marks: 100
Duration of ESE: 2 hrs. 30 min

Classification of Structures: Concept of statically indeterminate beam and frame, Analysis of fixed beam and propped cantilever, Rotation and sinking of support.

Slope and deflection: Castigliano's theorem for slope and deflection, Unit load method, slope and deflection in determinate beams and portals, Deflection in determinate trusses.

Influence line diagrams: Rolling loads on simply supported beams, concentrated and uniformly distributed loads, maximum shear force and bending moment, absolute maximum shear force and bending moment, Influence line diagrams for reactions, bending moment and shear force for determinate beams, Rolling loads on trusses, Influence line diagrams for forces in members of simple trusses.

Three hinged arches: Three hinged arches subjected to static loads, Bending moment, radial shear and axial thrust.

Slope deflection method: Analysis of continuous beams with and without sinking of support. Analysis of portal frames without side sway.

Moment Distribution method: Analysis of continuous beams with and without sinking of support and portal frames without side sway.

Text Books:

1. Basic Structural Analysis, Reddy C. S., 2nd edition, Tata – McGraw Hill, New Delhi, 2004.
2. Intermediate Structural Analysis, Wang, C. K., International Edition, McGraw Hill Inc, 1983

Reference Books:

1. Elementary Structural Analysis, Utku, Norris and Wilbur, 4th Edition, McGraw Hill Inc, 1991
2. Structural Analysis, R.C. Hibbler, 4th Edition, Prentice Hall, 1999
3. <http://www.nptel.iitm.ac.in>

CEU 502 DESIGNS OF STEEL STRUCTURES

Teaching Scheme: 03 L + 01T Total: 04

Credits: 04

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 3hrs.

Materials, structures and specifications: types of structural steel, mechanical properties of steel, advantages of steel as a structural material The basis of structural design-design consideration, code and specifications, Failure criteria for steel.

Design Approach: Factor of safety, Permissible and working stresses, Elastic Method, Plastic method, Introduction to Working stress Method and Limit state method

Loading and load combination-loads-dead loads, imposed loads, temperature effect, earthquakes, determination of wind loads as per IS 875(part 3), load combinations

Designs using Limit State Method:

Connections:

Riveted connections-Introduction

Welded connections: Advantages of welding, types and properties of weld, types of joint, weld symbols, design of welds, simple joints, moment resistant connections

Bolted connections: Behaviour of bolted connections, design strength of ordinary black bolt, simple connection, moment resistant connection

Design of tension member: Types of tension member, factors affecting strength of tension member, design of tension member

Design of compression members: Possible failure modes, classification of cross section, section used for compression members, effective length, single angle strut, built up compression members, column splicing for axial loads only.

Design of simple beams: Behaviour of beams in bending, design strength of laterally supported beams in bending, design strength of laterally unsupported beams in bending, maximum deflection, web buckling and crippling, introduction to plate girder design (no numerical problems on plate girder design)

Design of beam column: General behaviour of beam column, interaction between beam-column and structure, beam column under biaxial bending

Design of column bases: Types of slab bases, design of solid slab base for axial & eccentric loading

Text books :

1. Design of Steel Structures, N. Subramanian, 1st Edition , Oxford University Press, India, 2008
2. Design of Steel Structures (By Limit State Method as Per IS: 800—2007), S.S. Bhavikatti, 1st Edition , I. K. International Pvt Ltd, 2009

Reference books:

1. BIS 800-2007, Code of practice for general construction in steel, BIS New Delhi
2. BIS 875-1987 (Part I to V), Code of Practice for Design Loads (other than earthquake) for Buildings and Structures, BIS, New Delhi
3. SP 6 (Part I to Part 6) Handbook for structural engineers - Structural steel sections.
4. <http://www.nptel.iitm.ac.in>

CEU503 BUILDING DESIGN & DRAWING

Teaching Scheme: 02 L + 00 T Total: 02

Credits: 02

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE

Total Marks: 100

Duration of ESE: 3hrs.

Introduction: Importance of building drawing in construction & estimation, Selection of scales, dimensioning in architectural drawing, Abbreviations & graphical symbols used in Civil Engineering Drawing as per IS:962. Layout of sheet for Civil Engineering drawing.

Working Drawings of building: Concept of line plan & working drawings of the building, Combined first angle & third angle method of projection, Developing working drawings of the building from the given line plan. Details to be incorporated in the working drawings, Necessity and use of working drawing, Site plan, Block plan, Layout plan, Foundation plan, Developing working drawings and foundation plans, Layout plans for load bearing and framed structures.

Planning of residential building: Introduction, general principles of planning viz. aspect, prospect, roominess, privacy, grouping, circulation, ventilation, furniture requirement, Climate and design consideration, Orientation of buildings, requirement of the owner,. Provision of mezzanine floor, balconies and porches in the building. Common sizes of doors & windows, Common utilities such as parking, security, water supply, sanitation, etc. for apartments

Free hand sketches of building components and elevation features such as balconies, sun shades and sun breakers, grills, compound walls, compound gates, grill doors, door panel designs, window frame design, etc

Building rules and bye-laws: for residential buildings, conversion of land to nonagricultural lands, layout for a housing project, alternatives of building types viz. individual bungalows, semi-detached houses, row houses, apartments, Rules governing Plot area, Built-up area, Floor space Index, Building line, Set back, side margins, height of building, Provisions as per NCB

Planning of Public buildings: Types of public building and their requirements, planning of public buildings such as School Buildings, College Buildings, Hospitals, Primary Health Center, Multiplex, Shopping Complex

Plan sanctioning: Requirements of drawing as per plan sanctioning authorities

Text books:

1. Building Drawing, Shah M.G., Kale & Patki, Tata McGraw Hills Publishing Co., New Delhi
2. Architectural Working Drawings: Residential and Commercial Buildings, Spence William P., 1993

Reference books:

1. IS: 962-1989, Code of practice for architectural and building drawings, BIS, New Delhi.

2. AutoCAD Workbook for Architects, Shannon Kyles, Wiley-Blackwell, July 2008
3. Architectural Graphic Standards for Residential Construction: The Architect's and Builder's Guide to Design, Planning, and Construction Details, The American Institute of Architects, John Wiley & Sons, 2003.

CEU504 ADVANCED SURVEYING

Teaching Scheme: 03 L + 00 T Total: 03

Credits: 03

Evaluation Scheme: 15 CT1 + 15 CT2 +10 TA+ 60 ESE

Total Marks: 100

Duration of ESE: 2 hrs. 30 min

Control of Survey – Traverse, Types of Traverse, Traverse Surveying, Deflection Angle Traverse, Interior **Angle Traverse**, Latitudes and departure and its computation, Consecutive & independent co-ordinates, Gales Traverse table, checks in a closed traverse & an open traverse, error of closure

Theodolite Traversing: Locating details in a Theodolite traverse, angle mis-closure, balancing the angles of the traverse,

Total Station Traversing: Selecting a job, scale factor setting, azimuth angle setting, entering instrument station data, recording back sight point, recording angle measurement data, recording distance measurement data, recording notes, calculating azimuth angle by coordinates, coordinate resection measurement, height resection measurement, offset measurement, single distance measurement, angle offset measurement, two-distance offset measurement, registering known point data, reviewing known point data, reading in registered coordinate data

Tachometry: Purpose & advantages, Systems of Tachometric Measurement, Stadia systems and Non-stadia systems, Fixed hair method, Tangential method, subtense method, Principle of Stadia methods, determination of Tachometric constants, analytic lens, inclined stadia measurements, errors in stadia measurement.

Route Surveying: Simple circular curves -its elements, Designation & Degree of curve, Chord & Arc definition, Fundamental Geometry, Methods of setting out simple circular curves- chain & tape method, Rankin method, Two Theodolite method, obstacles in setting out curves

Transition curve: Purpose, length of transition curve, Ideal transition curve, characteristics of transition curve, computation of combined curve, procedure of setting out combined curve

Compound curve, theory and methods of setting out compound curves

Vertical curves: Requirement, Types, properties, Length, location of highest or lowest point

City Surveying: Control, equipment, topographic map, underground map, city property, survey, location of details

Underground Surveying: Surface alignment, correlation of surface and underground surveys, transferring levels underground, underground bench marks, setting out of pipelines and sewers

Hydrographic Surveying: Necessity, control, shore line survey, river survey, gauges, sounding equipment and procedure of taking sounding, methods of locating sounding, three point problem- mechanical & graphical solutions

Photogrammetric Surveying: Introduction, Basic principle, Photo-Theodolite, basic definitions, geometry of aerial and terrestrial photographs, Aerial photogrammetry, aerial camera, ground control for photogrammetry.

Remote Sensing & GIS: Introduction, application for survey.

Text Books:

1. Surveying & Leveling, Basak N., 1st Edition , Tata McGraw Hill, 2004.
2. Surveying Vol. I and II, Duggal S.K., 2nd Edition , Tata McGraw Hill, 2004.

Reference Books:

1. Surveying & Leveling Practice, Anderson J. M. and Mikhail E. M., 7th Edition, McGraw Hill, 1998.
2. Surveying Principles and Applications, Kavanagh, 7th Edition, Prentice Hall, 2007.
3. Surveying Fundamentals & Practices, Nathanson, Lanzafama and Kissam, 5th Edition, Prentice Hall, 2006.
4. Surveying, Moffitt and Bossler, 10th Edition, Prentice Hall, 1998.
5. <http://www.nptel.iitm.ac.in>

CEU 505 – WATER TREATMENT PROCESS AND TECHNOLOGY

Teaching Scheme: 03 L + 0 T, **Total:** 03

Credits: 03

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2 Hrs. 30 Min.

Sources of water: Surface water, Ground water, Infiltration galleries, relative suitability; Intake works, functions, types.

Water quality: Impurities in water: Turbidity, pH, Chlorides, Hardness, Residual Chlorine, Fluoride, MPN, Significance, Water quality standards

Demand of water: Water demand for domestic purposes, Fire demand, Per capita demand, Factors affecting consumption, Fluctuation in demand: Design period for water supply components, Population forecast: Arithmetical increase, Incremental increase, Geometrical increase, and Logistic curve methods

Distribution system: Types of distribution system: Continuous and intermittent supply systems, Gravity, Pumping and combined systems; Layout of distribution system: Dead end, Grid iron, Circular, and Radial systems; Major Losses & Minor Losses, Analysis of distribution system: Hardy Cross method, Service Reservoirs: Elevated service reservoir, Balancing reservoir, Necessity, Location, Capacity calculation by Mass curve method

Water Treatment: Flow diagram of conventional WTP; Aeration: Principle, Purpose, Design of cascade aerator; Flash mixer, function, design, power requirement; Flocculation: Coagulants, quantity of coagulants, Design of mechanical flocculator; Sedimentation: General equation for settling of discrete particles, Plain settling tank, Tube settler, Design of settling tank, Surface over flow rate, Detention period; flow through velocity, weir loading, design of Clariflocculator

Filtration: Objective, Filter Media, Rapid and slow sand filters: Number of filter units, Rate of filtration, Under drainage system, Backwashing, Negative head, Operation and cleaning, Design of slow and rapid sand filters, Design of under drainage system, Pressure filter

Disinfection: Objectives, Methods of disinfection, Chlorination: Free and combined chlorine, Residual chlorine, Effect of pH, Bleaching powder, Types of chlorination, Pre-chlorination, Post-chlorination, Break point chlorination, Super chlorination

Tertiary treatments: Softening: Lime soda, Quantity of lime and soda, Ion exchange; Effect of fluoride, Fluoridation and De-fluoridation

Text Books:

1. Environmental Engineering, H. S. Peavy, D. R. Rowe and T. George, McGraw-Hill Book Company, New Delhi, 1985.
2. Environmental Engineering, Gerard Kiely, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2007.

Reference Books:

1. Manual on Water Supply and Treatment, Central Public Health and Environmental Engineering Organization, Government of India Publication, New Delhi, 1993
2. Water Treatment Processes, S. Vigneswaran and C. Visvanathan, CRC Press, Boca Raton, Florida, USA, 1995.
3. Environmental Engineering, A. P. Sincer and G. A. Sincero, Prentice-Hall of India Private Limited, New Delhi, 2004.
4. Water Supply and Waste Water Disposal, Fair G. M. and Geyer J. C., John Wiley and Sons, Inc., New York, 1968.
5. <http://www.nptel.iitm.ac.in>

CEU 506 DESIGN OF STEEL STRUCTURES -LAB

Teaching Scheme: 02 P Total: 02

Credits: 01

Evaluation Scheme: 25 ICA + 25 ESE

Total Marks: 50

Duration of ESE: 3hrs.

PART 1. A Lab report & Structural drawings (using AutoCAD & manually) for the following

1. Analysis of roof truss
2. Design of members of roof truss
3. Design of purlin
4. Design of beam (Laterally supported and laterally unsupported)
5. Design of connections in roof truss
6. Design of bolted connection (simple and moment connection)
7. Design of welded connection (simple and moment connection)
8. Design of Column (Axially loaded)
9. Design of Beam-Column
10. Design of Slab base

It is representative list of practicals. The instructor may choose experiments as per his requirements (so as to cover entire content of the course) from the list or otherwise.

PART 2: Field visit on Steel Structure / Industrial Building / Railway Station / Bridges / Plate girders and submission of the report.

A Lab Report based on above experiments shall be submitted by each student

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge/skills acquired. The performance shall be assessed experiment wise by using continuous assessment formats, A&B

ESE: The end semester Exam for practical shall be based on oral examinations on the term work.

CEU507 BUILDING DESIGN & DRAWING LAB

Teaching Scheme : 04P Total: 04

Credits : 02

Evaluation Scheme : 50 ICA + 25 ESE

Total Marks :75

Duration of ESE: 3hrs.

PART 1 – MANUAL DRAWING

Developing following drawings on full imperial size sheets:

1. Developing working drawing of single storied residential building from the given line plan. (Load bearing structure).
2. Preparing line plan of residential building from the given data on the graph paper and developing its submission drawings as per requirement of the plan sanctioning authority (Load bearing structure/Framed structure) (Separate data should be given to group of students)
3. Developing line plan of any two public building from the given data on A2 size graph paper.
4. Sketch book containing at least 10 free hand sketches of building components and elevation features such as balconies, sun shades and sun breakers, grills, compound walls, compound gates, grill doors, door panel designs, window frame design, Furniture placement in rooms, kitchen layout, plumbing layout etc.

PART 2 – CAD DRAWING

1. AutoCAD commands

Drawing commands – Point, Line, Rectangle, Arc, Hatch, Text, Table, Use of Osnap

Dimensioning – Linear, aligned, continue dimensioning

Formatting – point style, line weight, line types, colour, text style, dimension style, table style, units

Editing commands – selecting objects, various methods of selection, Erase, Move, Copy, Break, Mirror, Rotate, Scale, Trim, Extend, Offset

Blocks- making and inserting blocks

Zooming and Panning

Saving & Printing the drawing – selection of scale

2. AutoCAD Drawings

Creating Working Drawings in AutoCAD of single storied residential building from the given line plan same as in exercise 1 of Part I and taking printouts.

Term work shall consist of following

1. Folder consisting of A1 size drawing sheet created in practical 1 and A2 size graph paper of practical 3 of Part1.
2. Sketch book containing at least 10 free hand sketches of building components.
3. Printouts of Working Drawings of single storied residential building created in AutoCAD.

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge/skills acquired. The performance shall be assessed experiment wise by using continuous assessment formats, A&B

ESE: The end semester Exam for practical shall be based on performance in AutoCAD and may be followed by sample questions.

CEU508 – ADVANCED SURVEYING - LAB

Teaching Scheme: 02 P Total: 02

Credits: 01

Evaluation Scheme: ICA 25 + ESE 25

Total Marks: 50

Duration of ESE: 3hrs.

List of Experiments

1. **Theodolite traversing** – Locating details, traverse calculations, traverse adjustment by Gales traverse table, Plotting the traverse and details on A1 size drawing sheet.
2. **Total Station traversing** – Selecting a job, entering instrument station data, recording back sight point, recording angle measurement data, recording distance measurement data, offset measurement
3. Finding out tacheometric constants of given tacheometer
4. Finding out horizontal and vertical distances between given points using tacheometer
5. Setting out simple circular curves by various methods.
6. To find the location a given point on the field using GPS receiver

A Lab Report based on above experiments shall be submitted by each student.

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge/skills acquired. The performance shall be assessed experiment wise by using continuous assessment formats, A&B

ESE: The end semester Exam for practical shall be based on performance in one of the experiments and may be followed by sample questions.

CEU 509 – WATER TREATMENT PROCESS AND TECHNOLOGY LAB

Teaching Scheme: 02 P Total: 02

Credits: 01

Evaluation Scheme: 25 ICA + 25 ESE

Total Marks: 50

Duration of ESE: 3hrs.

Part A: Analysis of water samples: Minimum six experiments from the following:

- i. Determination of pH of given/collected water sample
- ii. Determination of Hardness of given/collected water sample
- iii. Determination of Chloride content of given/collected water sample
- iv. Determination of DO of given/collected water sample
- v. Determination of Alkalinity of given/collected water sample
- vi. Determination of Acidity and Turbidity
- vii. Determination of Total solids of given/collected water sample
- viii. Determination of Iron content of given/collected water sample
- ix. Determination of Calcium content of given/collected water sample
- x. Determination of Residual chlorine of given/collected water sample
- xi. Determination of Alum Dose for given/collected water sample

Part B: Minimum two Design problems on course topics such as design of settling tank, flocculator, tube settler, rapid sand filter etc.

Part C: Visit to Water Treatment Plant. Visit report shall be in brief consisting of layout of plant, Necessity of units, Design details such as: flow, size, and specification etc along with cross-section of each unit

It is representative list of practicals. The instructor may choose experiments as per his requirements (so as to cover entire content of the course) from the list or otherwise.

A Lab Report based on above experiments shall be submitted by each student

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge / skill acquired. The performance shall be assessed experiment wise using continuous assessment formats A and B.

ESE: The End Semester Examination for Practical shall be based on the performance in one of the experiments / design problems and may be followed by sample questions.

CEU 510 – SELF STUDY- I

Teaching Scheme: 00L + 00 T Total 00

Credits: 02

Evaluation Scheme: 25 ICA + 00 ESE

Total Marks: 25

Duration of ESE: 3hrs.

Self study-I is based on one class test each, on the basis of 20% curriculum of the courses CEU501, CEU503, CEU504 and CEU505 to be declared by respective course coordinator at the beginning of the semester. These class tests should be conducted separately for each course and after CT2. The marks of all such class tests then shall be converted to out of 25. One faculty member shall be appointed as course coordinator for Self Study I and his/ her teaching work load shall be considered as one hr/week.

CEU 601 DESIGNS OF REINFORCED CONCRETE STRUCTURES

Teaching Scheme: 03 L + 00 T Total: 03

Credits: 03

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 3hrs.

Concept of reinforced concrete: History of RCC, objectives and methods of analysis & design, properties of concrete and steel, philosophies of design, working stress method: concept, rectangular beams under flexure, numerical problems,

Limit state method: Limit state of collapse - flexure (theories and examples), computation of parameters of governing equations, numerical problems on singly reinforced rectangular beams, doubly reinforced beams – theory & problems

Reinforced Concrete Slabs: One-way slabs, two-way slabs-Design and reinforcement detailing

Beams: Rectangular & flanged beams – theory and numerical problems, design for shear, bond, and development length

Columns: Limit state of collapse, design of short columns subjected to axially load, axial load with uniaxial bending & axial load with biaxial bending, slender columns

Foundations: Theory, Design of isolated square and rectangular footings subjected to axial load and bending moment (uniform depth only)

Staircases: Types and Design of doglegged Staircase

Introduction to Earthquake Resistant Design of Structures: Seismic Effects, Material Behaviour and General Principles of Earthquake Resistant Design of structures, ductile design and detailing of Earthquake Resistant Structures

Text Books:

1. Reinforced Concrete Design, Pillai S. U. and Menon Devadas., 3rd Edition, Tata Mc Graw Hill, New Delhi, 2009.
2. Illustrated Reinforced concrete Design, Shah V. L, Karve S. R 3rd Edition, Structures Publishers, Pune, 2008

Reference Books:

1. Design of Concrete Structures, Nilson A. H., Darwin D. and Dolan C. W., 3rd edition Tata Mc Graw Hill, New Delhi 2005.
2. “Fundamentals of Reinforced concrete design” M.L. Gambhir, Prentice Hall of India Private Ltd., New Delhi, 2004.
3. Advanced Reinforced Concrete Design, Varghese P.C., Prentice – Hall of India Pvt Ltd, New Delhi.
4. Limit State Designs of Reinforced Concrete, Varghese P.C., 2nd Edition, Prentice – Hall of India Learning, New Delhi, 2009.
5. “Fundamentals of reinforced concrete” N.C. Sinha and S.K Roy 4th Edition S. Chand Publishers, 2009.

6. "Reinforced concrete design" N. Krishna Raju and R.N. Pranesh 8th Edition New age International Publishers, New Delhi, 2004.
7. BIS 456-2000, Plain and Reinforced Concrete - Code of Practice, BIS, New Delhi
8. BIS 875-1987 (Part I to V), Code of Practice for Design Loads (other than earthquake) for Buildings and Structures, BIS, New Delhi
9. SP 16 Design aids for reinforced concrete to IS 456 BIS, New Delhi
10. SP 24 Explanatory Handbook of Indian standard code of practice for plain & reinforced concrete BIS, New Delhi
11. SP34 Handbook on concrete reinforcement & detailing (with amendment 1) BIS, New Delhi.

CEU602- GEOTECHNICAL ENGINEERING

Teaching scheme: 03 L + 00T

Total: 03

Credits: 03

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

Introduction: Introduction to Geotechnical Engineering, Soil formation and soil types, Regional soil deposits of India, Problems related to soils during construction.

Phase systems: Basic definitions and phase relationship, Index properties of soil & method of determination; Soil structures.

Classification of soils: Textural classification, Indian standard classification system, classified soils and its engineering properties.

Soil compaction: Laboratory compaction, factors affecting compaction, structure and engineering behavior of compacted soil, Compaction in field, compaction equipment, compaction specification and field control.

Soil water statics, concept of effective stress

Permeability: Darcy's law, laboratory and field methods of determination of coefficient of permeability of soil, factors affecting permeability, approximate coefficient of permeability of common soils.

Seepage analysis: Quick condition, Flow net and its properties, graphical method of flow net construction, determination of seepage by flow net, seepage force.

Stress Distribution: State of stress at a point, stress distribution in soil mass, Boussinesq theory and its applications, pressure distribution diagrams, Newmark's chart

Shear strength of soil: Mohr's circle of stress, Concept of failure, Mohr-Coulomb failure criterion, Determination of shear strength parameters of soil in laboratory by various methods, Effective and total stress shear strength parameters; Shear strength characteristics of clays and sands.

Consolidation: Spring analogy, Terzaghi's theory of one-dimensional consolidation (no derivation), solution of the consolidation equation, Laboratory consolidation test & Evaluation of compressibility and consolidation parameters, determination of pre-consolidation pressure.

Text Books:

1. Geotechnical Engineering, Venkatramaiah C., 3rd Edition New Age International (P) Ltd., Publishers, New Delhi, 2006.
2. Textbook of Soil Mechanics and Foundation Engineering, Murthy V. N. S., CBS Publishers & Distributors Pvt. Ltd. India, 2008 .

Reference Books:

1. Principles of Geotechnical Engineering, Das B. M., 7th Edition, Cengage Learning, Inc, Stamford, USA, 2010.

2. Soil Mechanics and Foundations, Muniram Budhu, 2nd Edition, John Wiley & Sons Publishers, 2007.
3. Geotechnical Engineering, Gulhati S. K. and Datta M., 1st Edition, Tata McGraw Hill Publishing Company, New Delhi, 2005.
4. SP: 36 (Part 1), Compendium of Indian Standards on Soil Engineering, Part 1, BIS New Delhi, 2001.
5. <http://www.nptel.iitm.ac.in>

CEU603 WATER RESOURCES ENGINEERING

Teaching Scheme : 03 L + 00 T Total: 03

Credit : 03

Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE

Total Marks :100

Duration of ESE: 2hrs.30 min.

Introduction: Irrigation Necessity, benefits of irrigation, Standards of irrigation water.

Estimating Irrigation Demand: Cropping seasons & base period, Principal Indian crops and their cropping seasons, Duty and Delta, Factors affecting Duty, Consumptive use of water-Experimental & theoretical methods, Gross command area, Irrigable command area, Culturable command area, Intensity of Irrigation, Determining the crop water requirement.

Types of Irrigation Schemes: Classification of Irrigation Projects, Direct & Indirect methods, Irrigation Project Structure

Minor Irrigation works: General layout and components of Bandhara irrigation scheme and percolation tank scheme, selection of suitable site, advantages & disadvantages, Selection of site and layout of Diversion Head Works, its components

Lift Irrigation: Necessity and general layout, main components

Planning of Water Storage Reservoir: Selection of site, various investigations, Area-capacity curve, Reservoir storage zones, Planning of reservoir, Effect of sedimentation, Life of reservoir and design criteria, Fixing capacity of reservoir, Fixing of Dead Storage & live storage, Fixing of flood and surcharge storage, Fixing Control levels, Control of sedimentation in reservoir.

Different types of Dams and their suitability, factors governing the selection of types of dam,

Design & construction of Gravity Dams: Typical layouts of gravity dam, Typical non-overflow section of concrete gravity dams, different components, Galleries-Types and their functions, The expected loadings for gravity dams –different forces acting, Earthquake and its effect on dams, Design steps for of concrete gravity dam sections- Criteria for safe design, Elementary and Practical profile of gravity dam, Stability analysis of gravity dam sections, Construction processes for gravity dams, Different types of Joints, Instrumentations in concrete dams.

Spillway: Types of spillway, Hydraulic design of Ogee-spillway, energy dissipation below spillway including its type, Design of stilling basin as per IS code, Different types of crest gates

Earthen dams: Types and elements of earth dam, causes of failure, seepage and drainage arrangement, phreatic line, Typical cross section of zoned section – components and their functions, Criteria for safe design, design of section, stability analysis, seepage control measures

Canals: Layout of canal system, Types of canals, Canal alignment, Typical cross-sections, Design of Canals, Balancing depth, cross section of canal, purpose and types of canal lining, maintenance of canals

Canal structures: Types, Canal falls, Head Regulator, Cross regulator, Canal escapes and canal outlets, Aqueduct, Siphon aqueducts, super passage, canal siphon, level crossing.

Text books:

1. Irrigation Water Resources and Water Power Engineering, Dr. P.N. Modi, Standard Book House, New Delhi, 2009.
2. Irrigation Engineering and Hydraulic Structures, R. K. Sharma, Oxford and IBH Publishing Company, New Delhi, 1994.

Reference books:

1. Concrete Dams, R. S. Vershney, Oxford and IBH Publishing Co., New Delhi, 1982.
2. Theory and Design of Irrigation Structures, R.S. Varshney, S. C. Gupta and R.L. Gupta, Nemchand & Brothers, Roorkee, 1992.
3. Water Resources Engineering, R.K. Linsley and J.L.H. Paulhus, McGraw Hill Book Co., 1992.
4. <http://www.nptel.iitm.ac.in>

CEU 604 - CONSTRUCTION MANAGEMENT

Teaching Scheme : 03 L + 00 T Total: 03

Credits: 03

Evaluation Scheme: 15 CT1 + 15 CT2 + 10 TA + 60 ESE

Total Marks: 100

Duration of ESE: 2hrs.30 min.

General Management: Evolution, applicability, definition, theories, Comparison between traditional management and modern scientific management, roles of Frederick Winslow Taylor, Henry Fayol, Elton Mayo, Mary Parker Follet, A.H. Maslow and Douglas McGregor. Management functions and Management styles.

Project management: Basic forms of organization with emphasis on Project and matrix structures; project life cycle, planning for achieving time, cost, quality , project clearance Procedures and necessary documentation for major works like dam, multi-storied structures, ports, tunnel, bridges, roads.

Resource Planning and Scheduling: PERT/CPM: Critical path theory and application. Bar chart, Grant chart, Construction Scheduling – Work break down structure, activity cost and time estimation in CPM, PERT

Materials Management: Role and objectives of materials management, Materials Procurement and Delivery, Inventory control- EOQ techniques

Construction Equipment: Choice of Equipment and Standard production Rates, Economic Cost of Equipment, Replacement analysis, downtime cost and obsolescence costs.

Personnel management: Importance, functions and mechanism of implementation of the functions.

Site management: Site layout and plan

Text Books:

1. Construction Equipment and its Planning and Application, Dr. Mahesh Varma, Metropolitan Book Company, New Delhi-, 1983.
2. Construction Accounting and Financial Management, William Palmer, 5th edn, McGraw-Hill Professional Publishing, 1999.

Reference books:

1. Construction Project Management Planning, Scheduling and Controlling- B. Sengupta & H. Guha , Tata McGraw Hill, New Delhi
2. Principles of Construction Management, Roy Pilcher, 3rd edition, McGraw-Hill, June 1992.
3. CPM in Construction Practices, Antil and Wood Head, 4th edn., John Wiley Pub., 1990.
4. Materials Management, D. S. Ammer, 3rd edn., Pub.: R. D. Irwin, 1974
5. CPM in Construction Management – James O'Brien, Tata McGraw Hill, New Delhi, 6th edn., 1999.
6. <http://www.nptel.iitm.ac.in>

CEU605 ESTIMATING & COSTING

Teaching Scheme : 03 L + 00 T Total 03

Credits : 03

Evaluation Scheme : 15 CT1 + 15 CT2 +10 TA+ 60 ESE

Total Marks :100

Duration of ESE: 3hrs.

Modes of Measurement: Modes of Measurement and units of measurement as per IS:1200.

Types of Estimate: Various methods of estimation.

Cost Building up: Purpose and principles, importance of schedule of rates in cost estimates.

Specifications: Purpose and principles of specification writing, Types of specification.

Rate analysis: Factors affecting rate analysis, Task work, market rate analysis, Fixed, variable, prime and supplementary cost, overhead cost.

Cost and Quantity Estimate: Detailed Estimate, Forms used, Detailed estimates of various civil engineering structures, Working out quantities of various materials required for construction. Earth work estimates in roads including hill road.

Cost Accounting: Various methods, classification of cost, direct and indirect charges, distribution of overheads, MAS account, issue rate of store accounts.

Valuation: Purpose of valuation, value and cost, market value, potential value, Sentimental value, scrap value etc. Net and gross return, Free hold and lease hold property, Sinking fund, Depreciation, capitalized value, annualized value, methods of valuation, rent fixation, valuation of old building.

Organization of construction industry: Govt. organization, PWD organization, site administration,, BOT, Role of Government department as a construction agency,

Contracts: types of contracts, Tender and Tender documents, E- Tender, Arranging contract works, methods of carrying out works, Indian contract law and Engineering contracts, land acquisition, Act, Legal aspects of various contract provision.

Tendering: Procedure adopted for tendering and contracting the major projects, various terminologies associated with tendering, contracting and execution of the major projects, Preparation of DPR, Analysis of project cost.

Concept of DBFOT, PMC, EPC,RFQ, RFP, LOA, CA, Concessionaire, Independent consultant, Design consultant, Escrow account, Project agreements

Text books:

1. Estimating and Costing in Civil Engineering, Theory and Practice, Datta B.N., 23rd Edition, UBS Publisher, New Delhi, 2003.
2. Estimating Building Cost, Popescu C. M., Phaobunjong Kan and Nuntapong Ovararin Dekker Publication

Reference Book

1. Estimating and Costing, Patil B. S., Oriental Longmans Publication, New Delhi.
2. National Building Code of India 2005, Group I to V, Bureau of Indian Standards, New Delhi
3. Recent 'Current Schedule of Rate' published by Public works Department

CEU606 DESIGN OF REINFORCED CONCRETE STRUCTURES – LAB

Teaching Scheme: 02 P Total: 02

Credits: 01

Evaluation Scheme: ICA 25 + ESE 25

Total Marks: 50

Duration of ESE: 3hrs.

PART I: Designs of different structural elements of a single storey building:

1. Design of simply supported slab
2. Design of cantilever slab
3. Design of one-way continuous slab
4. Design of two-way slabs having different boundary conditions
5. Design of beams for different support conditions such as simply supported, Fixed, continuous, and different types such as rectangular (singly/doubly), and Flanged beams(T-beam/ L-beams)
6. Design of Columns (Axially loaded, uniaxially and biaxially eccentrically loaded)
7. Design of Column footings (Axially loaded, uniaxially and biaxially eccentrically loaded)
8. Design of dog-legged stair

A Lab report consisting designs (using software's /manually) & structural drawings (using AutoCAD / manually) on Designs shall be submitted by each student

It is representative list of practicals. The instructor may choose experiments as per his requirements (so as to cover entire content of the course) from the list or otherwise.

A Lab Report based on above experiments shall be submitted by each student

PART II: Field Visit:

Field visit on any RCC framed structure under construction & submission of the report on site visit including copy of structural drawings and schedule of reinforcement collected from site.

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge / skill acquired. The performance shall be assessed experiment wise using continuous assessment formats A and B.

ESE: The End Semester Examination for Practical shall be based on the oral examination on design problems.

CEU607 GEOTECHNICAL ENGINEERING– LAB

Teaching Scheme: 02 P

Total: 02

Credits: 01

Evaluation Scheme: ICA25 + ESE 25

Total Marks: 50

Duration of ESE: 3hrs.

PART I- Lab. Experiments: Any seven laboratory experiments from the following:

1. Determination of water content of a given soil sample/soil samples collected from fields.

2. Determination of specific gravity of given soil sample/soil samples collected from fields.
3. Determination of plasticity index of given soil sample/soil samples collected from fields.
4. Determination of in-situ dry unit weight of soil
5. Determination of MDD & OMC of a given soil sample
6. Determination of coefficient of permeability of given soil samples by constant head / falling head permeability tests.
7. Determination of shear strength of given cohesive soil samples.
8. Determination of shear strength of given non-cohesive soil samples.

PART II: Any two from the following

1. To classify given soil samples by visual inspection.
2. Determination of characteristics of a black cotton soil.
3. Classify given coarse grained soil / fine grained soil samples as per IS Code

It is representative list of practicals. The instructor may choose experiments as per his requirements (so as to cover entire content of the course) from the list or otherwise.

A Lab Report based on above experiments shall be submitted by each student

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge / skill acquired. The performance shall be assessed experiment wise using continuous assessment formats A and B.

ESE: The End Semester Examination for Practical shall be based on the performance in any one lab. experiment followed by sample questions.

CEU608 – WATER RESOURCES ENGINEERING - LAB

Teaching Scheme: 02 P Total: 02

Credits : 01

Evaluation Scheme: ICA 25 + ESE 00

Total Marks: 25

PART 1: Design & Drawing of Irrigation Structures:

1. Fixing control levels of Reservoir
2. Design and Stability analysis of Gravity dam
3. Design & Stability analysis of an Earth Dam
4. Design of a spillway and stilling Basin.
5. Design of canals
6. Drawing of cross drainage works

Data for the design and drawing may be obtained from the Water Recourses Department for the existing or proposed Project.

PART II: Field Visit

A field visit to the construction site of earthen/Gravity dam, canal and canal structures shall be arranged. A report based on field visit consisting of copies of drawings collected from the field and salient features of the Project shall be submitted by each student.

A Lab Report based on above experiments shall be submitted by each student

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge / skill acquired. The performance shall be assessed experiment wise using continuous assessment formats A and B.

CEU609 ESTIMATING AND COSTING - LAB

Teaching Scheme: P - 02 Total: 02

Credits : 01

Evaluation Scheme: ICA 25 + ESE 00

Total Marks: 25

Duration of ESE: 3hrs.

PART I:

1. Drafting of Detailed Specifications for any SIX items of construction.
2. Detailed estimate of a single storied building with minimum four rooms with flat roof (Given problem).
3. Detailed estimate of any one type of bituminous road of minimum 1 km length including earthwork, sub-base and base course.
4. Detailed estimate of any two of the following: a) Septic tank for a colony b) R.C.C framed structure residential building c) Culvert.
5. Analysis of Rates for SIX items.
6. Problem of valuation of existing residential building.

PART II:

1. Study of Qe-Pro software/ Bentley Software and preparation of detailed estimate of building using the software

PART III:

1. Preparation of Tender & Tender documents.

A Lab Report based on above experiments shall be submitted by each student

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge / skill acquired. The performance shall be assessed experiment wise using continuous assessment formats A and B.

ESE: The End Semester Examination for Practical shall be based on the oral examination on term work.

CEU610 – MINOR PROJECT

Teaching Scheme: P - 02 Total: 02

Credits : 02

Evaluation Scheme: ICA 25 + ESE 25

Total Marks: 50

Duration of ESE: 3hrs.

Any one of the following group project (A or B) may be selected

A. Students should conduct a detailed survey for five to seven days period in a survey camp at a suitable site for a civil Engineering Project for Data collection & analysis, related Design and submit the report and related drawings based on the any of the following project:

- i. **Irrigation Project:** Tank basin survey, contour map, area-capacity curve.
- ii. **Irrigation Project:** Collection of data for Minor Irrigation scheme such as Bandhara scheme, design of scheme and preparation of drawings
- iii. **Water Supply Project:** Data collection for water requirement, selection of source, design of intake fixing alignment of rising main and profile leveling, design of rising main, selection of site for treatment plant, block contouring for treatment plant, fixing alignment of pure water rising main and profile leveling, fixing the location of ESR and block contouring of the site, survey for distribution network, design of distribution of network
- iv. **Sewerage system project:** Data collection for sewage quantity, fixing alignment of sewers and profile leveling, design of sewers, selection of site for sewage treatment plant, block contouring for treatment plant, preliminary design
- v. **Bridge Project:** Hydrological Data collection for project, fixing the location of bridge, River survey at bridge site, preliminary design of bridge.
- vi. **Road Project:** Road project of 1 km length including contouring, fixing alignment, design of curves, road geometric design, estimating quantity and cost of project.

B. Public/Society related problem such as Water supply Problem, Irrigation Management problem, Problems related to construction of defective roads and their poor maintenance etc.

The problem should be identified with the help of parent Department such as Water Recourses Department, Jivan Pradhikaran, Public Works Department etc and Project may be taken up to provide the solution to the same with the help of Industrial expert from the parent Department.

A Lab Report based on above experiments shall be submitted by each student

Note:

ICA: The Internal Continuous Assessment shall be based on practical record and knowledge / skill acquired. The performance shall be assessed experiment wise using continuous assessment formats A and B.

ESE: The End Semester Examination for Practical shall be based on the oral examination on term work.

CEU611 – SELF STUDY - II

Teaching Scheme: 00L + 00 T Total 00

Credits: 02

Evaluation Scheme: 25 ICA + 00 ESE

Total Marks: 25

Duration of ESE: 3hrs.

Self study-II is based on one class test each, on the basis of 20% curriculum of the courses **CEU601, CEU602,CEU603 and CEU604** to be declared by respective course coordinator at the beginning of the semester. These class tests should be conducted separately for each course and after CT2. The marks of all such class tests then shall be converted to out of 25. One faculty member shall be appointed as course coordinator for Self Study I and his/ her teaching work load shall be considered as one hr/week.

CEU612 – INDUSTRIAL LECTURE-I*

Teaching Scheme: 01L + 00 T Total: 00

Credits: 00 (* Credits shall be awarded on the basis of combined assessment of CEU612 and CEU710.)

Evaluation Scheme: 00 ICA + 00 ESE

Total Marks: 00

Duration of ESE: 00hrs.

Minimum twelve Industrial lectures shall be arranged, preferably once a week, which shall be delivered by the experts/Officials from Industries/Govt. organizations/ Private Sectors/Public Sectors such as Public works Department, Water Recourses Department, Jivan Pradhikaran, etc. and covering the various aspects of Project planning, Design, Construction materials, Field construction techniques, Construction Management, Material Testing, Recent advances in the field of Civil engineering etc. Topics of Industrial Lectures shall be general in nature and should not be the specific contents from the curriculum.