

Bhavnagar University
B.E. Semester VIII (Civil)
C- 801: Design of Steel Structures

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory		Pract/ Oral /Marks	T.W. Marks	
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.			
03	--	02	100	04	50	25	175

1. Loads:

Appraisal of loading standards such as I.S., I.R.C. Effect of wind and earthquake on structures.

2. Connection:

Stiffened and unstiffened, moment and shear resisting structural connections, design and detailing of connection between roof truss to column, column to beam to beam truss to bed block.

3. Design of Roof Trusses:

Various types of trusses and their selection in industrial structures, effect of wind & or other loads on trusses and structural detailing, moment and knee braced trusses.

4. Structural design of columns with eccentric loads including base.

5. Design of portal frames using elastic and plastic approach.

6. Design of steel structures:

Cantilever shed, plate girder, industrial building (rolled/tubular) including gantry girder, through and deck type bridges.

B. Term Work:

Term work shall consist of not less than 3 designs suitably selected from topics of the course under “ Design of structures ” The report shall consist of full analytical treatment, design procedure, references & all necessary drawings in the form of neat dimensioned sketches, In addition, two detailed working drawings shall on full size drawing sheets.

C). Practical /Oral:

Practical shall consist of oral and sketching based on the topics given under term-work.

D) Reference Book:

1. Design of steel structures- Dayaratnam,
2. Steel structures, - A.S. Arya and J.L. Ajmani
3. Code of practice for General Construction in steel- IS; 800-1984
4. Code of practice for structural safety of buildings loading standards- IS: 875-1984
5. Criteria for earthquake resistant design of structures- IS: 1983-1984
6. Design of steel structure Vol.II-Dr Ramchandra.
7. Design of steel structures -Rammurti

Bhavnagar University
B.E. Semester VIII (Civil)
C- 802: Computer Application in Civil Engineering

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory		Pract/ Oral /Marks	T.W. Marks	
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.			
03	--	04	100	03	50	25	175

1. Overview of C Programming:

Constant and variable; arithmetic expression; Input –Output statements:

Input-output through files; IF, GO, DO Loop statements, subscripted variables; Format specifications; Pointer; Functions and subroutines, character string.

2. Programming Concepts:

Programming elements; Conventional programming techniques; structured programming; Recursive and non – recursive programming techniques, functional programming.

3. Overview of Current Generation Software:

a) Windows – MS Office

b) Auto Cad

c) Word processing e.g. WordStar

d) Spread sheet e.g. Lotus-1-2-3, Excel, Window base.

e) Database management system e.g. dbASE, MATLAB, WINGRAPHER , ORIGINAL, ORACLE, SUPER etc

4. Civil Engineering Application:

Preparation of software for at least two problems from the following areas in FORTRAN and C Languages:

1. Water resources engineering

2. Irrigation engineering

3. Environmental engineering

4. Transportation engineering

5. Fluid mechanics

6. Surveying

The term work shall be based on above syllabus. The practical and oral examination will consist of defense on term work and solving simple examples on computer.

Bhavnagar University
B.E. Semester VIII (Civil)
C- 803: Water Resources Engineering -II

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory				
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.	Pract/ Oral /Marks	T.W. Marks	
03	--	02	100	03	50	25	175

A) Dam Engineering :

1. Earth dams:

Definition, Types, preliminary sections, seepage analysis , seepage control , stability of slopes, design criteria, design of earth dam, methods of construction and maintenance causes of failure & remedies measures.

2. Gravity Dam:

Definition, Elementary & practical profile, low and high dams forces acting on dam section, galleries, construction, joints in gravity dam, causes of failure. Design of dam, modern dams, methods of construction and maintenance , causes of failure and remedial measures.

3. Spillways:

Definition, Types suitability, advantages, disadvantage ; Types of spillway gages, forces actives on spillway, bucket and spillway bottom, energy dissipater, causes of failure, design of spillway, methods of construction and maintenance ; pauses of failure and remedial measures.

4. Miscellaneous:

Dam instrumentation, necessity, location, methods and functioning, check dams, power dams and other dams,

B. Canal and Canal Structure:

5. Diversion Head works:

Types , weir, barrage Their essential component parts, functions and Location, Head and cross regulator, weir on permeable soil Bligh's and Khosala's theory important design consideration's (design of diversion head work) construction and maintenance. Remedial measures.

6 Distribution system:

Method of channel design, comparison, advantages and disadvantage, applicability of methods, design of channel system by different methods, construction, maintenance, failure and remedial measures.

7. Canal Structure:

Classification types and location of canal structures, design of canal & reservoir outlets, regulation works, cross drainage works and other canal structures. Construction, Maintenance, Failure and remedial.

8. Miscellaneous:

Investigation, planning, execution computerization and management of irrigation schemes.

Term work shall above syllabus

Text Book:

1	Water Resources Engineering	Arrora & Bhattacharya	Shtya prakashan , Delhi
2	Water Resources system Egg	Hall, Warren	Tata Mc Graw Hill Pub, co. Delhi
3	Irrigation and Hydraulic structures	Bahast Rabuche	S.R.Kotson Pub. House Ludhiana
4	Irrigation and Hydraulic structures	S.K.Garge Market	Khanna Pub, 2-B, Nath market, Nai sarak, Delhi.
5	Irrigation and Hydraulic structures	R.K.sharma	Oxford & IBH Pub, Delhi
6	Design of Irrigation Structures	Varshne & Gupta	Satya prakashan Delhi
7	Irrigation and water power engineering	Dr.B.C.Puna miya	Laxmi Publication

Reference

1	Water resources Engg	Linsley Rayh K ans Franjini	Mc graw Hill International Book co Auokland.
2	Soil and water consecration engineering	G O Sdrawb	John wiley & sons
3	Ground water resources evaluation	Wiltow, William	Mc Graw Hill
4	Economic appraisal of Irrigation projects in India	B.Sinha	Ms Agricole Pub ,Delhi
5	Imp. Aspects of river valley Project	J.F.Mistry	M/s Mahjan Book , Ahmedabad

Indian Standards

		Number
1.	Dam and appartemant structures	9796
2	Earthdam	8826,7356,7894,8414
3	Earth and Rockfill drainage system	9429
4	Foundation settlement measurement	8226
5	Gravity dam	10135,6512
6	Earthwork for canal	4701
7	Canal	7114,6936,4410,6513,10430,4745

Bhavnagar University
Bhavnagar
B.E. Semester VIII (Civil)
C-804: Civil Engineering Management

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory		Pract/ Oral /Marks	T.W. Marks	
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.			
03	--	--	100	03	--	--	100

1. General:

Construction as industry; scope, objectives and functions of administration on construction industry; Interactions of construction economy, Engineer and constructor, construction resources and coordination; elements of management and organization.

2. Construction planning and control:

Necessary; construction stages; planning procedure and schedules for construction and resources; project layout and job planning, engineering in construction; special cases of construction planning erection of steel structures, construction in busy/restructured/congested locality; construction of high rise structures, demolition of structures, earthwork planning.

3. Construction Labor:

Characteristics; sources; labor relations, legislature and welfare; labor turnover, efficiency, wages and incentives.

4. Construction Materials:

Methods and limits of procurement; types of materials and storage, distribution; accounting and control; order point and order quantity; disposal of surplus materials.

5. Construction equipment:

Classification and characteristics; sources; owning and operating cost; economic life; replacement of equipment; equipment v/s labor intensive works and their balancing

6. Construction plants:

Aggregate production plant; concrete batching and mixing plant; bituminous mix and paver plant; drilling plant; earthwork plants.

7. Economic Analysis:

Financial comparison of project / job / equipment alternatives and decision making; break-even and minimum cost analysis; methods of economic analysis of civil engineering projects; construction cost index and its application.

8. Network Techniques for project management:

Elements of network planning; CPM and PERT; critical path analysis Time – cost relationships; crashing, updating and resource leveling; network documents; Monitoring and control of time cost and physical progress.

Books: 1. Construction of Structure and Management of work-S.C.Rangwala

2. PERT & CPM-B.C.Punamiya

3. Construction Management-Dhir & Lala

Bhavnagar University
Bhavnagar
B.E. Semester VIII (Civil)
C-805: Elective Paper-II
(Open Channel Flow)

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory		Pract/ Oral /Marks	T.W. Marks	
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.			
04	--	02	100	04	50	25	175

1. General Classification:

Velocity distribution in open channel flow.

2. Non Uniform Flow.

1. Rapidly Varied flow.

Theory and application of hydraulic jump, location of jump gradually varied flow.

2. Characteristics of flow profilers general dynamic Engg of G.V.F. Methods of profile application in practice.

3. Unsteady flow, flood routing, stream flow routing Muskingum method Open Channel surges.

4. Sediment Transport .

Introduction types of sediments, characterizes of sediment in motion, bed formation, threshold movement, silt curve, Bed load and suspended load and their methods of estimation, resistance to flow in alluvial streams.

5. Stable channel, Lacey, Kennedy and silt theories, tractive force, methods.

6. River Engineering in brief tutorial : Based on theory course prescribed Above.
Term work and oral shall above syllabus

References:

1. Henderson F.M.: Open Channel Flow. The Macmillan Co, New York.
2. Chow V.T. "Open Channeio Hydratics" Mobiraw Hill BNook Co, New York.
3. K.G. Ranga Raju " Flow in open Channels Vol. I & II- Tata Migrow Hill, New Delhi.
4. K. Subramanya " Flow in open channels Vol. I & II- Tata Migrow Hill, New Delhi.
5. B.C. Punmia Garg " Irrigation & Water Power"
6. K.R. Arora Fluid Mechanics, Srandard publisher, Delhi-6

Bhavnagar University
Bhavnagar
B.E. Semester VIII (Civil)
C-805: Advanced Reinforced Concrete Design (Elective Paper-II)

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory		Pract/ Oral /Marks	T.W. Marks	
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.			
04	--	02	100	04	50	25	175

A) Theory:

1. Loads:

Loading, standards as per I.S. distribution of loads. Computation of wind and earthquake forces, introduction to loading standards for bridges.

2. Structures:

Cantilever sheds, retaining walls: Counterfort type T-beam bridges, R.C. Pipes, chimneys.

3. Storage Structures:

i) Structures for the storage of water. Overhead conical tanks, intze tank, supporting tower for overhead tanks.

ii) Structures for the storage of solids – silos and bunkers.

4. Term work:

Term work shall consist of not less than 4 design suitably selected from topics of the course under “Design of reinforced concrete & prestressed concrete structures “Design shall be incorporated in a report which shall consist of all full analytical treatment, design procedure reference of all necessary structural drawings in form of neat dimensioned sketches, in addition one detailed working drawing shall be prepared on full imperial size drawing sheet.

C). Practical:

Practical shall consist of oral and sketching based on topics given under the subject.

D). Reference Books:

1. Plain & Reinforced concrete Vol.-II- Jaikrishns, O.P.Jain
2. Storage Structures- K.Rajagopalan
3. Advanced Reinforced Concrete design- N.Krishnaraju
4. Code of practice for Plain & reinforced concrete (III revision) (with amendment-I) - IS: 456
5. Code of practice for structural safety of building, loading standards (revised) (with amendment-I) - IS: 875
6. Criteria for earthquake resistant design of structures (III revised). - IS: 1893-1975

Bhavnagar University
Bhavnagar
B.E. Semester VIII (Civil)
C-805: Geotechnical Engineering-II (Elective Paper-II)

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory				
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.	Pract/ Oral /Marks	T.W. Marks	
04	--	02	100	04	50	25	175

A) Theory:

1. Earth Pressure:

Critical study of earth pressure theories, coulomb wedge study analysis, solutions of ranking and coulomb earth pressure theories with inclined wall and sloping backfill, backfill, active and passive earth pressure determination by Rebhan and Cullman graphical methods, earth pressure due to point load acting on ground surface, earth pressure on sheeting of trenches in cohesive and non-cohesive soils, cantilever sheet pile wall.

2. Bearing Capacity:

Critical study of different bearing capacity theories Rankin Brandt, Terzaghi, Meyer of, Kempton, Hanson Felonious, bearing capacity from perimeter shear concept, plate load tests using one plate and two-layer of different sizes, SPT, bearing capacity for two – layer soil system allowable bearing capacity on the basis of charts developed by Terzaghi & Peck, bearing capacity of eccentrically loaded footing's methods to reduce foundation settlement.

3. Deep Foundation:

Study of pile foundations in details, single piles, group of piles, pile groups in cohesive and granular soils, vertical cyclic pile load test and interpretation test data, negative skin friction, pile heave and its effect on load carrying capacity, under – reamed pile foundations – its concept, design and field installation forces acting on well foundation.

4. Foundation on Collapsible Soils:

Significant characteristics of collapsible soils, problems and solution for footing on such soils.

5. Foundation on Expansive Soils:

Significant characteristics of expansive soils, problems and solution for footing on such soils, ONS layer method.

6. Elements of Machine Foundations:

Introduction, elementary vibrations, free vibrations, forced vibrations, understanding of damping effects, blasting vibrations, earthquake vibrations, effects of vibrations on foundations, definition of natural frequency.

B) Term Work:

The term work shall consist of laboratory work and tutorials (minimum 30 problems) based on the course of study under Geotechnical Engineering-II)

C) Practical/ Oral:

Practical examination shall consist of oral based on term work.

D) Reference Book:

1. Analysis and Design of Foundation – J.Bowles
2. Hand book of Foundation Engg. -Fang. & Others
3. Soil Mechanics and Foundation Engg. Vol.II- V.N.S.Mirthy
4. Principles of Foundation Engg. - Braj Das.

Bhavnagar University
Bhavnagar
B.E. Semester VIII (Civil)
C-806: Civil Engineering Project - II

Teaching Scheme			Examination Scheme				Total Marks
Hours per week			Theory		Pract/ Oral /Marks	T.W. Marks	
Theory Lectures Hours	Tut Hours	Practical	Marks	Hrs.			
--	--	04	--	--	100	50	150

The Civil Engineering Project –II shall comprise of –

(A) One database project,

OR

(B) One visit – based project

In any one or more of the following areas:

1. TRANSPORTATION ENGINEERING.
2. WATER RESOURCES ENGINEERING
3. TOWN PLANNING & HOUSING
4. ENVIRENMENTAL ENGINEERING

A) Data – Based Project:

Based on the given project data, the detailed design excluding structural design shall be done, and suitably presented in the form of report and necessary drawings.

B) Visit – Based Project:

A Technical visit shall be made to any important civil engineering project either in progress or completed, and brief and comprehensive report shall be prepared bringing cut the salient features of the project, planning and design aspects, construction techniques, financial aspects, operation and maintenance aspects etc.

Term work, Practical / Oral shall be based on the course under Civil Engineering Project-II