

Course Title: Design Of Structures -II (Code: CIV-601)	Syllabus for B.Tech. 6th Semester (Civil Engineering)	Total Course Credit: 4			
Midterm Examination	Class Assessment (Assignments, interaction, tutorials, viva etc.)	Major Examination	L	T	P
30 Marks	10 Marks	60 Marks	2	2	0

Course Outcomes:

CO1: Design of bolted and welded connections; concentric and eccentric

CO2: Design of rolled and built-up tension members.

CO3: Design of rolled and built-up compression members.

CO4: Design of laterally supported and unsupported flexural members

CO5: Design of plate girders

CO6 :Understanding failure modes and application of Limit States Design philosophies of Steel Design

S. No.	Course Contents	Contact Hours
01.	Introduction to structural steel and their Design philosophies. Properties, rolled sections.	4
02.	Design of bolted connections; concentric and eccentric.	3
03.	Design of welded connections; concentric and eccentric.	3
04.	Design of tension members; Rolled and Built-up sections.	4
05.	Design of compression members; Rolled and Built-up sec. design of column bases	5
06.	Design of flexural member, laterally supported, laterally unsupported and built-up beams.	6
07.	Design of Plate Girders with special focus on shear buckling & use of stiffeners.	4

References:

- 1) Design of steel structures By Subramanian
- 2) Steel structures – Design & Behaviour By Salmon & Johnson
- 3) Design of steel structures By SK Duggal.
- 4) Design of steel structures By Vizrani and Ratwani

Course Title: TRAFFIC ENGINEERING AND ROAD FACILITIES (Code: CIV- 602)	Syllabus for B.Tech. 5th Semester (Civil Engineering)	Total Course Credit: 4			
Midterm Examination	Class Assessment (Assignments, interaction, tutorials, viva etc.)	End-Term Examination	L	T	P
30 Marks	10 Marks	60 Marks	2	2	0

Course Objective: To impart understanding and knowledge of various aspects of Traffic Engineering and Road Facilities.

Course Outcomes:

CO1: To understand the various aspects of roads, road characteristics, road capacity

CO2: To understand the level of service concept & traffic control devices.

CO:3 To understand the aspects of traffic flow, fundamental relation of traffic flow, etc.

CO4: To understand the intersections and interchanges along with their requirement and design.

S. No.	Course Contents	Contact Hours
01.	Components of traffic system-vehicle characteristics; human characteristics, road characteristics & traffic-control devices.	06
02.	Intersections- unsignalized intersections, channelization and roundabouts, interchanges- requirement & design.	10
03.	Traffic signs- role and types, signalized intersections, signal timing design; signal coordination, Parking facilities- parking demand, on- street parking, off-street parking.	14
04.	Traffic flow theory-flow parameters; fundamental relation of traffic flow, road capacity and level of service concept.	10

References:

1. CA O'Flaherty, Transport Planning and Traffic Engineering, John Wiley & Sons, Inc., New York; Toronto, 2002.
2. McShane & Roess, Traffic Engineering, Prentice-Hall of India Private Ltd, New Delhi- 110001, 1990.
3. Kadiyali & Lal, Principles and Practices of Highway Engineering, Khanna Publishers, Delhi- 6, 1996.
4. Chakarborty & Das, Principles of Transportation Engineering, Prentice-Hall of India Private Ltd, New Delhi-110001.
5. L. R. Kadiyali, Traffic Engineering and Transport Planning, Khanna Publishers, 2-B, Nai Sarak, Delhi- 110006, 1999.

Course Title: Geotechnical Engineering II (Code: CIV- 603)	Syllabus for B.Tech. 6TH Semester (Civil Engineering)	Total Course Credit: 3			
Midterm Examination	Class Assessment (Assignments, interaction, tutorials, viva etc.)	Major Examination	L	T	P
30 Marks	10 Marks	60 Marks	2	1	0

Course Outcomes (COs)

CO1: To equip the knowledge of strength and mechanical behaviour of soils.

CO2: To understand the concepts of bearing capacity and foundations.

CO3: To understand the practical aspects of earth pressure and retaining structures.

CO4: To understand the concepts of slope stability along with its practical application

S No	Contents	Contact hours
01	SHEAR STRENGTH: Shear strength concept. Mohr's Coulumb equation. Laboratory determination. Triaxial compression test under different Drainage conditions ,viz undrained, drained and consolidated, direct shear test. Unconfined compression test. Strength envelope.	8
02	BEARING CAPACITY AND FOUNDATIONS: Basic definitions and methods of determination, Prandtl's solution. Terzaghi's solution for ultimate bearing capacity. Size effects. Effects of rigidity of footings. Plate load test. Design principles for footing and rafts. Foundations on clay sand sands Foundations types and applications, Pile foundation types, classification sand determination of load carrying capacity, dynamic and static methods. Pile load test, pile groups efficiency of pile groups.	12
03	EARTH PRESSURE: Lateral earth pressure. Rankine's theory Active and Passive States .Lateral earth pressure under various conditions, like surcharge, sloping backfill and high water table behind the wall. Earth pressure diagrams. Total thrust. Tension Cracks.	10
04	STABILISATION: Methods of stabilization. Brief introduction to each of the methods of stabilization such as shotcreting, geo reinforcement	05
05	STABILITY OF SLOPES: Infinite slopes, conjugate stresses, stability number Swedish and Friction circle methods. Submergence case, complete draw down case, Steady seepage case.	07

References:

1. Ranjan, G and Rao, P., "Basic and Applied Soil Mechanics", New Age International Pvt. Limited, New Delhi, 2002.
2. Arora, K.R., "Soil Mechanics and Foundation Engineering", Standard Publishers Distributors, Delhi, 1987.
3. Singh, A., "Basic Soil Mechanics & Foundations", CBS Publishers & Distributors, 2004.
4. Taylor, D.W., "Fundamentals of Soil Mechanics", Wiley, New York, 1948.
5. Bowles, J.E., "Physical and Geotechnical properties of Soils", McGraw Hill Publishers, 1979.
6. Terzaghi, K., "Theoretical Soil Mechanics", Wiley, New York, 1943.
7. Terzaghi, K., Peck, R.B. and Mesri, G., "Soil Mechanics in Engineering Practice", 1996.
8. Jumikis, A.R. "Soil Mechanics", R.E. Krieger Pub. Co., Florida, US, 1984.
9. Purushothama, P. "Geotechnical Engineering", McGraw Hill Education, 1995.
10. Venkataramaiah, C., "Geotechnical Engineering", New Age International Publishers, Daryaganj, New Delhi, 1995.

Course Title: IRRIGATION AND HYDRAULIC STRUCTURES (Code: CIV- 604)	Syllabus for B.Tech. 6th Semester (Civil Engineering)	Total Course Credit: 4			
Midterm Examination	Class Assessment (Assignments, interaction, tutorials, viva etc.)	Major Examination	L	T	P
30 Marks	10 Marks	60 Marks	2	2	0

Course Outcomes:

CO1: To appreciate various methods of irrigation and water application to agricultural fields.

CO2: To carry out hydraulic design of irrigation canals, diversion headworks and cross-drainage works.

CO3: To appreciate the soil-water- plant relationship and understand the crop water requirements.

CO4: To Understand various aspects of water logging of agricultural lands.

S. No.	Course Contents	Contact Hours
01.	INTRODUCTION Present status of irrigation in India, Advantages of irrigation, brief description of Gravity, Lift and Sprinkler irrigation.	04
02.	SOIL-WATER- PLANT RELATIONSHIP. CROP WATER REQUIREMENTS: Soil moisture and crop water relationships, Duty, Delta, Consumptive use, Irrigation requirements, Principal Indian crops, Multiple Cropping, etc.	08
03.	CANAL IRRIGATION: Types of canals, parts of canal irrigation system, channel alignment, assessment of water requirements, estimation of channel losses, Design of channels, Regime and semi theoretical approaches, Canal lining, factors affecting choice of various types of canal linings.	04
04.	DIVERSION HEADWORKS: Selection of site and layout, Parts of diversion head works, types of weirs and barrages, Design of weirs on permeable foundations, control of silt entry into canal, Silt excluders and different types of silt ejectors	04
05.	CROSS DRAINAGE WORKS: Necessity of cross drainage works, their types and selection, Design of various types of cross drainage works-Aqueduct, Siphon aqueduct, Super passage, Siphon, Level crossing.	06

06	WATER LOGGING: Causes, preventive and curative measures, drainage of irrigated lands, saline and alkaline lands.	04
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References:

1. Singh Bharat. "Fundamentals of Irrigation Engineering", Nem Chand & Brothers, Roorkee.
2. Varshney, Gupta and Gupta, Irrigation Engineering and Hydraulic Structures". Nem Chand & Brothers, Roorkee.
3. Arora, K.R. Irrigation, water power and Water Resources Engineering", Standard Publishers Distributors, Delhi.
4. Asawa, G.L. "Elementary Irrigation Engineering" New Age International (P) Ltd. Publishers, New Delhi.

Course Title: WATER SHED MANAGEMENT STRUCTURES (Code: CIV-611-E1)	Syllabus for B.Tech. 6th Semester (Civil Engineering)	Total Course Credit: 3			
Midterm Examination	Class Assessment (Assignments, interaction, tutorials, viva etc.)	Major Examination	L	T	P
30 Marks	10 Marks	60 Marks	2	1	3

Course Outcomes:

CO1: To perform studies related to watershed management.

CO2: To prepare pre-feasibility and detailed project reports, etc.

CO3: To appreciate the concept of integrated water resources management.

CO4- To understand the concepts of renewable energy, biomass, etc.

CO5- To equip with the rural technological delivery systems and low cost technology that can be used in the farm.

S. No.	Course Contents	Contact Hours
01.	INTRODUCTION Importance of Water Shed Development for improvement in Environment. Status of Watershed Development in India, Watershed Concepts	04
02.	Land: Survey(layout), Soil and Soil Moisture Conservation, Rainwater Management, Reclamation of saline soils.	08
03.	Water: : Data and Analysis, Integrated Water Resources Management, Conjunctive Use	04
04.	Greenery: Agriculture, Crop Husbandry, Sustainable Agriculture, Biomass, Management, Dryland Agriculture, Irrigation, Pastures and Silvopastures, Horticulture, Social Forestry, Afforestation.	04
05.	Energy: Renewable Resources, Biomass, small hydropower, Ocean Tides and Waves.	06
06	Socioeconomics: Peoples' part, State and Integrated Approach, Sustainable Society, Economics.	04
07	Appropriate Technology Farm Equipment, Contour Methods, Check Dams, Water Catchment and Harvesting, Low Cost Technology, Rural Technological Delivery Systems.	03

References:

- 1 Murthy, J.V.S. Watershed Management, New Age International Publishers (P) Ltd. India.
- 2 Suresh, R. Watershed Hydrology, Standard Book House, India. .
- 3 Das, Ganshyam. Hydrology and Soil Conservation Engineering, Prentice Hall of India. .

