INSTITUTE	**FACULTY OF TECHNOLOGY**
PROGRAM	**BACHELOR OF TECHNOLOGY (CIVIL ENGINEERING)**
SEMESTER	**7**
COURSE TITLE	**PIPELINE ENGINEERING**
COURSE CODE	**01CI0725**
COURSE CREDITS	**3**

Objective:

1 To design economical the water supply project.
2 To provide a safe, regular, and enough water supply to the community.
3 To know the hydraulics involved in the water distribution system.
4 To understand various pipe fittings and materials

Course Outcomes: After completion of this course, student will be able to:

1 Compute the economic diameter of the rising main for the water supply system.
2 Design of water distribution system using LOOP/WATER GEMS.
3 Calculate the capacity of the Elevated Storage Reservoir.
4 Describe different pipe materials and lining-coating requirements.
5 Explain pipe laying, jointing, and testing of pressure as well as non-pressure pipe.

Pre-requisite of course: Basics of Fluid Mechanics and Hydraulics

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Hydraulic Design of Rising Main** Introduction of Rising main, Hydraulic design Formula, Head losses in pipes, Design Criteria of distribution system such pressure, velocity, minimum diameter of pipe, etc, Types of pumps and its selection, Rising main design and economic analysis	10
2	**Water Distribution System** Peak factor, continuous and intermittent water supply, Analysis of flow in WDS, Analysis of pipe network by various methods, Software used for the design of WD: LOOP/WATER GEM/EPANET, ESR mass balance	10

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Contents : Unit	Topics	Contact Hours
3	**Pipes and Appurtenances** Factor to consider selection of pipe materials, Types, of pipe, corrosion, Lining and coating of pipe, Types of Valves and its usage, Horizontal and vertical bends, flow meter	6
4	**Pipe Laying, Jointing and Testing** System Test Pressure, Exaction, bedding, lowering, and handling of pipes, Types of joints, Testing of pressure pipe and none pressure, Welding techniques, Design, and procedure qualifications, Testing of welding joints by Non-destructive testing methods	8
5	**Pressure Transient and Water Auditing** Water hammer, Surge Pressure and analysis and its calculation, Remedial measure for water hammer and devices used to control water hammer, use of thrust block, water audit, Online monitoring and control system, Leakage detection in pipeline, Burst detection techniques	8
Total Hours		**42**

Textbook :

1 Analysis of Water Distribution Network , P. R. Bhave and R. Gupta, -, 2001

References:

1 Water supply and sanitary engineering , Water supply and sanitary engineering , G.S.Birdie and J.S.Birdie, -, 2001

Suggested Theory Distribution:

The suggested theory distribution as per Bloom’s taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery

Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
5.00	20.00	45.00	15.00	10.00	5.00

Instructional Method:

1 Prerequisites of the course and its pattern shall be discussed at the commencement of the course.

2 Lectures shall be conducted in the classroom using various teaching aids.

3 Presence in all academic sessions is mandatory which shall carry 5% marks of the total internal evaluation.

4 A minimum of two internal exams will be conducted and an average of two will be considered as a part of a 15% overall evaluation.

Instructional Method:

5 At the end of each unit/topic, an assignment based on the course content shall be given to the students which shall carry 5% weightage for timely completion and submission of the assigned work.

6 The assignments/tutorials/technical visits are planned in such a way that they cover the practical aspects of the course contents.

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