

| 20PEB331E | | | | | Pipeline Engineering | | | | | |
|-----------------|---|---|---|----------|----------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 2 | 0 | 0 | 2 | 2 | 25 | 50 | 25 | -- | -- | 100 |

COURSE OBJECTIVES

- Fundamental knowledge and understanding of industry terms and acronyms
- Deeper insight between design basis, fluid properties
- Comprehensive understanding of specifications and specialties of various valves
- Fundamental knowledge and understanding of corrosion and its preventions

UNIT 1**6 Hrs.**

Modes and comparison among different modes of transportation of petroleum products, Advantages and limitations of pipelines modes, Introduction to pipeline project, Economics and cost structure of Pipeline project, Economic pipe diameter.

UNIT 2**7 Hrs.**

Introduction to outline for Design & construction of onshore-offshore pipelines, Pipeline codes and standards, Overview of O & G field Processes, Types of Onshore/ Offshore Pipelines, Factors affecting pipeline design (External, fluid properties, pipeline parameters and Fluid flow considerations. Loop- lines

UNIT 3**7 Hrs.**

Design of Liquid pipelines: Hydraulic Analysis, Relevant Pipeline Parameters, Types of fluids, Pressure Loss calculations, Maximum allowable operating Pressure, Pipeline sizing, Diameter sizing, Determination of wall Thickness, Station Spacing Pumping Power calculations, Design of Gas Pipelines: Factors affecting Gas Pipeline Design, Pressure Loss calculations, Gas pipeline Hydraulic Calculations, as Compression / Power requirement.

UNIT 4**6 Hrs.**

Commissioning of pipeline. Pipeline Operations, Pigging, integrity assessment by Intelligent pigging and Instrumentation, Monitoring and Control Thru SCADA application, Corrosion and control/ Cathodic Protection.

Max. 26 Hrs.**COURSE OUTCOMES**

On completion of the course, student will be able to

- CO1: Understand the basics of pipeline, roles and responsibilities of a pipeline engineer in the oil and gas Industry
- CO2: Apply pipeline codes, regulations and standards in both offshore and onshore environments.
- CO3: Attribute pipeline terminology, various components and materials used and the fluid properties that affect pipeline transportation.
- CO4: Evaluate forces acting on a pipeline system in operating conditions.
- CO5: Analyse the processes involved in the prevention of corrosion and the inspection of pipeline and its components.
- CO6: Adapt to various safety issues and practices involved in onshore and offshore pipeline operations.

TEXT/REFERENCE BOOKS

1. Alkazraji Duraid, (2008) A quick guide to pipeline engineering WOODHEAD Publishing Limited
2. Vincent, Jecques (2010) Fundamentals of Pipeline Engineering, Gulf Publishing
3. Antaki, G. A. (2003) Piping and Pipeline Engineering, Marcell Dekker.
4. Modelling of oil and products and gas pipeline transportation by Mikhail V Luric
5. Pipeline Engineering by Henry Liu

END SEMESTER EXAMINATION QUESTION PAPER PATTERN**Max. Marks: 100**

Part A/Question: <Short Notes, Problems, Numerical>

Part B/Question: <Justification, Criticism, Long answers, Interpretation >

Exam Duration: 3 Hrs

<5-7 > Marks (each)

<8-10> Marks (each)