

Oil and Gas Pipeline Design, Maintenance and Repair

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Course Description

BASIC INFORMATION

Title: Oil and Gas Pipeline Design,
Maintenance and Repair

Code: PE 607

Credit Hrs.

Lectures: 2

Tutorial: 0

Practical: 0

Total: 2

PROFISSIONAL INFORMATION

1. OVERALL AIMS OF COURSE
2. INTENDED LEARNING OUTCOMES (ILOs)
3. CONTENTS
4. TEACHING AND LEARNING METHODS
5. STUDENT ASSESSMENT METHODS
6. LIST OF REFERENCES
7. COURSE COORDINATOR

1. COURSE OBJECTIVES

- Expand the scope of the petroleum engineer to include the importance pipeline materials and components.
- Include fluid flow through pipes, pipeline materials and components, the loads the stresses applied on the pipeline, the design procedures of oil and gas pipeline.
- Pipeline locations and the hazards associated with each type, the pigging technique to clean the pipeline, leak detection, pipeline repair procedures
- Corrosion process and the protection measures, the pipeline network and the design procedures and pipeline design case study and the feasibility measures

2. INTENDED LEARNING OUTCOMES (ILO's)

a. Knowledge and Understanding

- Pipeline manufacturing, Materials, Fittings, Installation and Construction
- Measuring instrumentation and leak detection
- Pipeline maintenance and repair
- Pipeline network and pigging

b. Intellectual Skills

- Thinking skills for design analysis
- Systemic skills for material selection
- Creative thinking for water hammer and cavitation detection
- Creative thinking for safety system analysis and pig selection

2. INTENDED LEARNING OUTCOMES (ILO's)

c. Professional Skills

- Design calculation
- Inspection methods
- Pipeline protection
- Case study procedures

d. General and Transferable Skills

- Operation reporting
- Hazard awareness
- Computer application

3. CONTENTS

Contents	Lectures	Lab/Tutorial
Part 1: Gas Piping System	2	-
Part 2: Single phase Incompressible flow of Newtonian Single	8 8	2 2
Part 3: Phase Incompressible Flow of Newtonian		
Part 4: Pipeline Components	2	-
Part 5: Design of Pipelines	6	2
Part 6: Planning and Construction of Pipelines	4	2
Part 7: Instrumentation and Pigging	4	2
Part 8: Pipeline maintenance	4	-
Part 9: Pipeline defects	2	-
Part 10: Corrosion in pipeline	2	-
Part 11: Pipeline rehabilitation	2	-
Part 12: Leak detection and SCADA system	4	-
Part 13: Risk assessment	2	-

4. TEACHING AND LEARNING METHODS

- 4.1 Lectures, including slide show and power point presentations
- 4.2 Case studies ended by discussions
- 4.3 Tutorial and Practice classes for problems answer.
- 4.4 Laboratory work and reports

5. STUDENT ASSESSMENT METHODS

5.1	Attendance	Assess	willing to learn
5.2	Assignment	Assess	knowledge and understanding
5.3	Case Study	Assess	intellectual and professional skills
5.4	Presentation	Assess	group work and communication skills
5.5	Midterm Exam	Assess	practical, general and transferable skills
5.6	Final exam	Assess	Most of the skills

Assessment schedule

Assessment No.	Assessment Type	Time
Assessment 5.1	Attendance	Weekly
Assessment 5.2	Assignment	Biweekly
Assessment 5.3	Case Study	Week 10
Assessment 5.4	Presentation	Week 15
Assessment 5.5	Midterm Exam	Week 12
Assessment 5.6	Final exam	Week 30

Weighting of Assessment

Assessment No.	Assessment Type	Weight, %
Assessment 5.1	Attendance	5
Assessment 5.2	Assignment	5
Assessment 5.3	Case Study	5
Assessment 5.4	Presentation	5
Assessment 5.5	Midterm Exam	20
Assessment 5.6	Final exam	60
Total assessments	Total	100

6. LIST OF REFERENCES

6.1 Course Notes

- Course notes will be handed to the students or downloaded from the website

6.2 Essential Books

- George A., Antaki, Piping and Pipeline Engineering: Design, Construction, and Repair (Mechanical Engineering, Volume 259, 2003)
- McAllister, W., Pipeline Roles of Thumb Handbook, Fifth Edition, 2005

6. LIST OF REFERENCES

6.3 Recommended Books

- Lee, R.R., Pocket Guide to Flanges, Fittings and Piping Data, 2003
- Frankland, Thomas W., The Pipe Fitter's and Pipe Welder's Handbook, 1999
- Graves, W.V., The Pipe Fitters Blue Handbook,
- Peabody, A.W., Control of Pipeline Corrosion

6.4 Periodicals, Web Sites, ... etc.

6.5 Selected Software

- Pipeline Toolbox (Enterprise Edition) www.technicaltoolboxes.com/software/pipeline_enterprise.htm,

7. COURSE COORDINATOR

Prof. Dr. Abdel-Alim Hashem

Date: 2/15/2006

QUESTIONS

