



<b>Course Code</b> OGEE-545DL	<b>Course Title</b> Oil and Gas Transport Networks	<b>ECTS Credits</b> 7.5
<b>Department</b> Engineering	<b>Semester</b> Fall, Spring	<b>Prerequisites</b> None
<b>Type of Course</b> Required	<b>Field</b> Oil, Gas and Energy Engineering	<b>Language of Instruction</b> English
<b>Level of Course</b> 2 <sup>nd</sup> Cycle	<b>Year of Study</b> 1 <sup>st</sup> /2 <sup>nd</sup>	<b>Lecturer</b> Dr Constantinos Hadjistassou
<b>Mode of Delivery</b> Distance Learning	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

**Objectives of the Course:**

The main objectives of the course are to:

- Introduce students to onshore oil and gas transmission networks and right-of-way issues
- Learn the prominent pipeline codes, specifications and standards
- Present the fundamental principles governing pipeline hydraulics
- Familiarize attendees with the technical characteristics of pumping and compressor stations and coolers
- Outline the most common pipeline defect mechanisms
- Explain the major cleaning, monitoring and maintenance techniques
- Detail the operational hazards, safety, and physical security issues and cyber-attacks risks

**Learning Outcomes:**

After completion of the course students are expected to:

- Learn about the economic and technical issues of pipeline networks
- Familiarize themselves with right-of-way and access to pipeline systems
- Be aware of the important pipeline codes, specs, standards & regulations
- Master the fundamental flow equations and physics of gaseous and liquid flow in conduits through their application in a pipeline (simulation) network
- Acquaint themselves with the technical matters pertaining to liquid flow pumping and compressor stations and coolers
- Understand the most frequent pipeline defects mechanisms including crack formation, corrosion, and erosion
- Know the most common internal oil & gas pipeline cleaning methods, flow and pressure monitoring and maintenance methods
- Be aware of the operational hazards of pipeline, safety, physical security issues

and cyber-attacks

**Course Contents:**

- Technical, business and economic issues of oil & gas trunklines, transmission, and distribution networks
- Pipeline codes, specifications, international standards and regulations
- Pump and compressor types including reciprocating and centrifugal systems, prime movers such as electric motors, internal combustion engines, gas turbines
- Bernoulli equation, laminar and turbulent flow, equations of flow: mass conservation and Navier-Stokes
- Frictional losses, pressure drop, flow rate and velocity measurements and valves
- Engineering aspects of liquid fuel pumps, gas compressor stations and cooling machinery
- Pipeline material defects and protection techniques such as corrosion protection and erosion mitigation
- Most popular internal oil & gas pipeline cleaning methods, flow and pressure monitoring techniques and maintenance strategies
- Computer simulation of a pipeline system; flow and pressure characteristics, terrain elevation, power requirements
- Vibration issues, flow instabilities, cavitation issues, fire hazards, physical security and protection and cyber-threads

**Learning Activities and Teaching Methods:**

Lectures, Online Questions, Projects, Discussion

**Assessment Methods:**

Assignments, Online Exercises, Final Exam

**Required Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
Liu Henry	Pipeline Engineering	Lewis Publishers	2003	0587161400

**Recommended Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
Dickenson, C. T.	Valves, Piping and Pipelines Handbook	Elsevier	2007	185617252
Bruce E. Larock, Roland W. Jeppson & Gary Z. Watters	Hydraulics of Pipeline Systems	CRC Press	2000	0849318068