

**King Saud University
College of Engineering
Petroleum and Natural Gas Engineering Department**



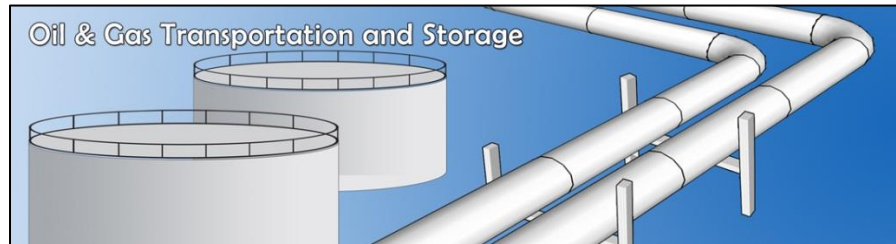
PGE 455

Transportation and Storage of Petroleum and Natural Gas

نقل وتخزين البترول و الغاز الطبيعي

**Compiled by
Professor Musaed N. J. Al-Awad
أ. د. مساعد بن ناصر العواد**

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malawwad@ksu.edu.sa

PGE 455: Transportation and Storage of Petroleum and Gas, 2(2-1-0)

<u>INSTRUCTOR</u>	Professor Musaed N. J. AlAwad
<u>OFFERING:</u>	Required and offered every semester
<u>YEAR/LEVEL:</u>	5/9
<u>PRE-REQUISITES:</u>	PGE 481: Production of Naturally Flowing Wells
<u>CO-REQUISITES:</u>	None
<u>TEXT BOOK</u>	<ul style="list-style-type: none">• Handouts prepared by the course instructor.
<u>REFERENCES:</u>	<ul style="list-style-type: none">• Kennedy J.L., "Oil and Gas Pipeline Fundamentals", Penn Well Publishing Company, Tulsa, Oklahoma, 1984.• Bell S.B., "Petroleum Transportation Handbook", USA, referred to McGraw-Hill book company, Inc., 1963. "The Flow of Complex Mixtures in Pipes", Govier, G.W. and K. Aziz, Van Nostrand Reinhold Company, 1972.• Others.
<u>EVALUATION PLAN:</u>	Home Works (10%), Mid-term exam 1 (25%), Mid-term exam 2 (25%), Final Exam (40%).
<u>TOPICS COVERED:</u>	Crude Oil Classification, Natural Gas Classification, Oil and Gas Transportation Methods, Crude Oil Pipelines in Saudi Arabia, Type of Pipeline Accidents, Environmental Effects of Pipeline Construction and Operation, Examples of the Major Global Marine Oil Spills, Oil Spill Response in Saudi Arabia, Oil Pollution Treatment Techniques, Pipeline Repair Techniques, Pipeline Route Primary Selection Factors, Pipelines Engineering Design, Gas Pipeline Flow Rate Capability, Weymouth-Blasius Equation, Panhandle "A" Equation, Darcy Equation for Calculation of Pressure Drop (less than 100 psi) in Short Distances Gas Pipelines, Pipelines Loop, Series and Parallel Pipelines, Pipelines Leakage, Flow of Liquids Through Pipelines, Friction Factors, Pressure Traverse and Maximum Capacity of The Pipelines, Increasing the Capacity of Pipelines, Hydraulic Gradient for Pipelines, Flow of Gas in Pipelines, Pressure Traverse, Corrosion Control of Pipelines, Storage Tanks and Pressure Vessels; Types Design Calculations, and Foundation, Pumps and Compressors, Corrosion Control and Fire Prevention, Auxiliary Equipment.

MAIN COURSE CLOs RELATION TO PROGRAM (ABET) SOs:

CLO1: (100% SO1)	SO1
An ability to recognize and identify the items required to select the most appropriate pumps, compressors, and number of stations needed.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
CLO2: (100% SO2)	SO2
An ability to Design a pipeline for oil and natural gas transportation, and storage tanks and pressure vessels for oil, gas, and liquefied gases.	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
CLO3: SO1: 100%	SO1
An ability to Recognize and solve topographical problems related to oil and gas transportation.	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.