

College of Engineering Petroleum and Natural Gas Engineering Department

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

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

INSTRUCTOR	Professor Musaed N. J. AlAwad
OFFERING:	Required and offered every semester
YEAR/LEVEL:	5/9
PRE-REQUISITES:	PGE 481: Production of Naturally Flowing Wells
CO-REQUISITES:	None
TEXT BOOK •	Handouts prepared by the course instructor.
<u>REFERENCES</u> : •	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.
EVALUATION PLAN:	Home Works (10%), Mid-term exam 1 (25%), Mid-term exam 2 (25%), Final Exam (40%).
TOPICS COVERED:	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, Bernoulli Equation, 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 in horizontal and non-horizontal Pipelines, Corrosion Control of Pipelines, Pipeline Life Estimation, Pipelines Auxiliary Equipment, Underground Storage, Storage Tanks and
	Prevention, Storage Tanks Auxiliary Equipment.

MAIN COURSE CLOs RELATION TO PROGRAM (ABET) SOs:

CLO1: (100% SO1)

An ability to recognize and identify the items required to select the most appropriate pumps, compressors, and number of stations needed.

CLO2: (100% 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.

CLO3: SO1: 100%

An ability to Recognize and solve topographical problems related to oil and gas transportation.

SO1 (S1)

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

SO2 (S2)

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.

SO1 (S1)

An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

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