



University of Nicosia, Cyprus

<b>Course Code</b> OGEE-410	<b>Course Title</b> Natural Gas Reservoir Engineering	<b>ECTS Credits</b> 6
<b>Department</b> Engineering	<b>Semester</b> Fall, Spring	<b>Prerequisites</b> OGEE-330
<b>Type of Course</b> Required	<b>Field</b> Oil & Gas Engineering	<b>Language of Instruction</b> English
<b>Level of Course</b> 1 <sup>st</sup> Cycle	<b>Year of Study</b> 4 <sup>th</sup>	<b>Lecturer(s)</b> Dr Vasileios Drakonakis
<b>Mode of Delivery</b> Face-to-face	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

**Objectives of the Course:**

The main objectives of the course are to:

- Familiarize students with the fundamental principles and governing laws associated with natural gas reservoir engineering
- Transfer knowledge on the behavior and important properties of natural gas
- Provide knowledge and expertise on contemporary practices and methodologies used in natural gas reservoir engineering
- Develop and discuss numerical models and techniques used for the characterization of gas flow in wellbores and reservoirs
- Describe techniques for gas well testing and performance evaluation of the well
- Discuss models and techniques used for volumetric estimation of gas in-place and recoverable hydrocarbons from gas reservoirs
- Discuss techniques used for performance evaluation of gas reservoirs
- Description of natural depletion and the development of gas-condensate reservoirs by gas injection

**Learning Outcomes:**

After completion of the course students will be able to:

- Use current techniques and methodologies for the effective simulation and characterization of gas reservoirs
- Perform calculations for the characterization of gas flow in wellbores and gas reservoirs based on measured rock and gas properties
- Apply techniques for volumetric estimation of gas in-place and recoverable hydrocarbons from gas reservoirs
- Use techniques for gas well testing and performance evaluation of gas wells
- Apply techniques to solve transient gas flow problems in gas reservoirs
- Apply techniques such as natural depletion and gas injection for the development of gas-condensate reservoirs

**Course Contents:**

- Introduction to natural gas and gas reservoir engineering
- Reservoir properties (rock types, porosity, viscous flow and inertial flow resistance, capillary pressure, etc.)
- Gas properties (composition, compressibility, condensate/gas ratio, viscosity, etc.)
- Phase behavior of gas
- Recoverable reserves (bulk volume, pore volume, etc.)
- Material balance
- Single-phase gas flow (steady-state Darcy flow, steady-state radial flow, transient flow, linear flow, etc.)
- Gas well testing (drawdown tests, buildup tests, etc.)
- Wellbore flow mechanics
- Water coning
- Natural depletion
- Gas injection

**Learning Activities and Teaching Methods:**

Lectures, in-class examples, exercises, design project

**Assessment Methods/Reading:**

Homework, tests, final exam, project report

**Required Textbooks/Reading:**

<b>Authors</b>	<b>Title</b>	<b>Publisher</b>	<b>Year</b>	<b>ISBN</b>
J. Hagoort	Fundamentals of Gas Engineering	Elsevier Science	1988	9780444429919