

**Seminar Name:** Advanced Natural Gas Engineering

**Instructor:** Prof. Michael. J. Economides.

**Discipline:** All disciplines in the oil and gas and processing industries.

**Description:**

The role of natural gas in meeting the world energy demand has been increasing because of its abundance, versatility, and its clean burning nature. As a result, new gas exploration, field development and production activities are under way, especially in places where natural gas was, until recently, labeled as “stranded”. Because a significant portion of natural gas reserves worldwide are located across bodies of water, gas transportation (pipelines, LNG, and CNG) becomes an issue. Finally natural gas is targeted for a new generation of gas to liquid (GTL) technologies. All of these necessitate a seminar to cover the unique issues and challenges related to natural gas from upstream to midstream and downstream.

**About the Instructor:**

**Michael Economides** holds many positions such as professor at the University of Houston, managing partner of an industrial consulting firm and Editor-in-Chief of Energy Tribune. He has written 14 textbooks and over 200 journal papers and articles and is considered by many as the premier world expert on petroleum production engineering. In addition he has written extensively on the geopolitics of energy. He is a frequent guest on national and international media such as CNBC, Fox News, Dow Jones Wire, NPR, Bloomberg, and BBC World Service.

**Seminar Outline:**

- Natural Gas Basics
  - Geological Settings, Natural Gas Origin and Accumulation
  - Natural Gas Composition and Phase Behavior
  - Hydrates
  - Natural Gas Properties and Useful Correlations
- Unique Issues in Natural Gas Exploration, Drilling, and Well Completion
- Natural Gas Production for both Vertical and Horizontal Wells
  - Darcy and non-Darcy Inflow
  - Hydraulic Fracturing
  - Performance of a Hydraulically Fractured Well with Turbulence
- Natural Gas Processing
  - Natural Gas and Liquid(s) Separations
  - Two- and Three-Phase, Horizontal and Vertical Separator Design Procedure
  - Natural Gas Dehydration – Water Removal
  - Natural Gas Hydrates

- Natural Gas Transportation – Pipeline and Compressed Natural Gas
  - Pipeline Sizing
  - Marine CNG Transportation
  - Liquefied Natural Gas (LNG)
- Gas-To-Liquids (GTL)
  - GTL Processes
  - Direct and Indirect Conversion of Natural Gas
  - Fischer-Tropsch Synthesis
  - GTL Economics and Outlook
- Underground Natural Gas Storage
  - Types of Underground Storage
  - Storage Measures: Gas Volume, Loss, and Injectivity