Application of ABET Criterion

King Saud University
Petroleum Engineering Department

PGE 487: 3(3,1,0)
Natural Gas Engineering


Instructor: Mohammed M. Amro, Associate Professor, Petroleum Engineering.
Office: 2B-49
Phone: 966 1 4676863
E-mail: mamro@ksu.edu.sa

Textbooks:
1- “Gas Production Operations”,
   Beggs, H.D., OGCI Publications, Oil & Gas Consultants International Inc. 
2- “Natural Gas Reservoir Production Engineering”.

Prerequisite: PGE 461

Description: Gas properties, Gas reservoir performance, piping system performance, gas 
   compression, total system analysis, flow measuring, gas condensate 
   reservoirs, field operation problems and gas processing.

Objectives: The course is designed to provide the students with the fundamentals of 
   natural gas engineering; gas reservoir deliverability as well as the optimum 
   design of subsurface completion and production facilities.

Topics Covered Gas properties: Ideal gases, real gases, other equation of states, gas 
   compressibility, gas viscosity, gas-water systems, and types of gas reservoirs 
   (3 Classes), gas reservoir performance: reservoir gas flow, well deliverability 
   tests, transient testing, and reservoir limit test (12 Classes), gas reserves, well 
   completion effect on gas reservoir performance (3 Classes), 
   Piping system performance: flow equations, flow in wells, and flow in 
   pipelines (8 Classes), Gas compression, types and design of compressors (3 
   classes), total system analysis: tubing and flowline size, separator pressure 
   effect, Subsurface safety valve selection, separator pressure effect (7 
   Classes), gas condensate reservoir (3 Classes), Field operation problems (2 
   Classes) and gas processing (1 Class).

Classes/Tutorials: Classes are held three times per week in 50 minutes lectures plus one tutorial 
   class of 50 minutes per week.

Evaluation: 10% for Attendance, participation, quizzes and Home works. 40% for two 
   midterm exams and 50% for the final examination.

Relationship with ABET and Program Outcomes (objectives):
This course contributes to the general ABET objectives as well as the listed objectives of the Department Petroleum Engineering:

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**Course Improvement Actions:**
A review of different actual publications related to gas production engineering is considered to update the content of this course. Special emphasis is laid on field problems and the detailed implementation of the course content to solve the problems is discussed.

**Science/Design:** 2/1