

PETE 4241- Unconventional Gas Reservoirs

Spring 2012

Main Instructor

Arash Dahi
Department of Petroleum Engineering
Office: Patrick Taylor Hall 3224
e-mail: a_dahi@lsu.edu
Office hours: M- W 1:00 – 2:00.

Lecture

M - W 4:40-6:00 pm
Location: Patrick Taylor Hall 2427

Grading

Mid-term Exams	35%
Quiz	5 %
Final Exam	35%
Homework	15%
Final project	10%

University Policies

The Louisiana State University provides upon request appropriate adjustments for qualified students with disabilities. For more information, contact the Office of the Dean of the College of Engineering.

Scholastic dishonesty will not be tolerated and incidents of dishonesty will be reported.

Course Outline

- Geology of Unconventional reservoirs
- Petrophysical properties – FE
- Fundamental concepts in horizontal drilling
- Geosteering
- Torque and drag and hole cleaning
- Reserve Estimation in UGS

- Introduction to hydraulic fracturing treatment
- Fractured Well Performance - Radial flow
- Rock Mechanics and Elasticity principles
- Fracture mechanics
- Natural fractures and their role in UGR
- In situ stress and rock mechanical properties
- Near wellbore issues
- Fracture height prediction
- Hydraulic Fracture Geometry
- Horizontal and deviated well fracturing
- Fracturing Fluid (Rheology and Constitutive laws)
- Proppant and proppant transport
- Fluid Leak-off models
- Coupled Models for modeling hydraulic fracturing process
- Design issues
- Pressure decline analysis
- Hydraulic Fracture evaluation – diagnostics issues

References

Several SPE and AAPG papers (will be posted later)

Handouts (Distributed only during the lectures)

API Guideline (Will be posted on Moodle)

Textbook

Design and Appraisal of Hydraulic Fractures, 2009, Jack R. Jones and Larry K. Britt, ISBN: 978-1-55563-143-7, Published by SPE.

Recommended Reading Material

Petroleum Engineering Handbook, Volume VI: Emerging and Peripheral Technologies, 2007, Edited by: H.R. Warner Jr.

Recent Advances In Hydraulic Fracturing, Edited by: John L. Gidley, Stephen A. Holditch, Dale E. Nierode and Ralph W. Veatch, SPE Monograph Series Vol. 12

Mechanics of Hydraulic Fracturing, Yew, Gulf Professional Publishing

Hydraulic Fracture Mechanics, Peter Valko, Michael J. Economides