PETE 4090- Unconventional Hydrocarbon Reservoirs

Spring 2016

Main Instructor

Dr. Arash Dahi
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Office: Patrick Taylor Hall 2115
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Office hours: T-Th 2:30 – 3:30.

Lecture Time

M - W 4:30-5:50 pm

Misconduct / Dishonesty

Any kind of misconduct and dishonesty will be reported to the Department Chairman, the Dean of Engineering, and/or the Dean of Students in writing. This includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, and any act designed to give an unfair academic advantage to the student. Then the case will be investigated by the University (NOT by the instructor) and the students have the right to appeal to the University (again NOT to the instructor). Further information can be found at http://www.geol.lsu.edu/StudentInfo/BSDegree/LSUAcademicMisconduct.pdf

Disability Services

If you have a disability that may have some impact on your work in this class and for which you may require accommodations, please see an advisor in the Office of Disability Services (112 Johnston Hall) so that such accommodations may be arranged. After you receive your accommodation letters, please see the instructor as soon as possible to discuss the provisions of those accommodations.

Other Important University Policies

All students are required to read and be familiar with the Code of Student Conduct found at www.lsu.edu/judicialfairs as well as all other University policies and procedures.

Grading

Mid-term Exams	30%
Quiz	10%
Final Exam	40%
Homework	20%

Course Outline

- 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
- Reserve Estimation in UGS
- Hydraulic Fracture evaluation – diagnostics issues
- Geology of Unconventional reservoirs
- Petrophysical properties – FE

Textbook

M. Smith and C. Montgomery, Hydraulic Fracturing published by CRC Press 2015

Other References

Several SPE and AAPG papers (will be posted later)
Handouts (Distributed only during the lectures)
Halliburton Cement Handbook
API Guideline

Recommended Reading Materials

Reservoir Stimulation. Michael J. Economides, 3rd Edition, Wiley, 2000.

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

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