

PETR 370 (4 cr. hrs.)
Reservoir Evaluation and Lab
Spring Semester 2009

<http://infohost.nmt.edu/~petro/faculty/engler.html>

Instructor: Dr. Thomas Engler, MSEC 386, engler@nmt.edu

Course Description: Evaluation of reservoir properties from log, core and pressure transient data. Interpretation of openhole well logs and pressure drawdown and buildup tests. Lab exercises in analyzing log and welltest examples, preparation of subsurface maps. (Crosslisted with GEOP 370)

Course Objectives:

- Apply the fundamentals of physics and chemistry to understand tool principles and operation
- Compare core and log data and understand the differences/similarities in scale
- Determine formation properties from well log data and interpret the results
- Apply volumetric calculations to a multiwell reservoir
- To estimate the reservoir's capacity to transmit fluids, the reservoir's energy, and the effectiveness of the well completion and the subsequent impact on well performance

Prerequisites: PE 345 and lab – Reservoir Engineering I; PHYS 122 – General Physics II; GEOL 317 - Sedimentary Rocks and Process

Materials:

Required: "Theory, Measurement, and Interpretation of Well Logs", Bassiouni, SPE Textbook Series, Vol. 4, (1994) Member price **\$90.00**, List Price **\$180**

Required: "Advances in Well Test Analysis", Monograph Vol 5, SPE (1977) Member Price **\$40**, List Price **\$80**

Recommended: "Pressure Transient Testing", W.J.Lee, et al, SPE Textbook Series, Vol 9, (2003) Member price **\$105**, List Price **\$210**

Course Outline:

Well logging(Mondays & Wednesdays)

- (1). Introduction
- (2). Fundamentals
- (3). Wellbore Environment
- (4). Determination of R_w
- (5). SP and GR logs
- (6). Resistivity logs
- (7). Porosity logs
- (8). Interpretation (Clean fms., gas-bearing fms., Shaly fms.)

Well Testing (Fridays)

- (1). Principles of transient test analysis
- (2). Pressure drawdown testing
- (3). Pressure buildup testing
- (4). Estimating average reservoir pressure
- (5). Multirate testing
- (6). Linear flow
- (7). Heterogeneities

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Grading:

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|-----------------|-----|
| Homework | 20% |
| Midterm | 30% |
| Final Exam | 30% |
| Lab assignments | 20% |

Note: NO MAKEUP TESTS! An excused absence will result in additional weight on the final exam. Unexcused absence of exam will result in a zero grade.

For an excused absence to be valid you must notify me prior to missing class. Also, if sick, a copy of your doctor's excuse must be submitted to me immediately after you return back to school. Waiting to the end of the semester to submit your excuse will not be accepted!

Class attendance will be recorded. For students whose final grade is on a grade borderline, excellent attendance is a persuasive argument to obtain the next higher letter grade.

Academic Honesty: Students are expected to adhere to all academic policies; therefore, any cheating on examinations, plagiarism or other forms of academic dishonesty will not be tolerated and may subject the student to penalties ranging from a failing grade to dismissal.