

PETR 370 (3 cr. hrs.)
Formation Evaluation and Lab
Spring Semester 2012

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

Instructor: Dr. Thomas Engler, MSEC 398, engler@nmt.edu

Course Description: Introduction to logging tool principles and operation. Evaluation of reservoir properties and interpretation of open hole well logs. Multiwell correlations with application to volumetric calculations. Lab exercises on reservoir mapping and well log case studies. (Same as EARTH 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

Prerequisites: PE 345 and lab – Reservoir Engineering I; PHYS 122 – General Physics II;
ERTH 206 – Fundamentals of Earth's Crust

Materials:

Required: "Theory, Measurement, and Interpretation of Well Logs", Bassiouni, SPE Textbook Series, Vol. 4, (1994)

Course Outline:

Well logging

- (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.)

Lab

1. Wellposting and data acquisition
2. Structure contouring mapping
3. isopach mapping
4. cross sections
5. net pay and HCIP
6. case studies - interpretation

**PETR 370 (3 cr. hrs.)
Reservoir Evaluation
Spring Semester, 2012**

Grading:

Quizzes	20%
Midterm	30%
Final Exam	30%
Lab assignments	20%

Quizzes. Twelve in class quizzes will be given. The lowest two will be dropped. Some maybe open book or notes. See posted schedule for days.

Midterm and Final Exams. Will be closed book and notes. An equation sheet will be provided.

Note: NO MAKEUP TESTS or Quizzes! 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.

Preliminary Schedule

Date	Day	Topic	Reading assignment	Quiz Date
18-Jan	W	intro		
23-Jan	M	Fundamentals	Chap 1, Sec 1.1-1.4, 1.6,1.8	
24-Jan	T			
25-Jan	W	Fundamentals		Q
30-Jan	M	Reserves	Chap 11, 11.4-11.7	
31-Jan	T			
1-Feb	W	Reserves		Q
6-Feb	M	Borehole environment	Chap 4, 4.1-4.4	
7-Feb	T			
8-Feb	W	Measurement of Rw	Chap 4, 4.5-4.6 Chap 12, 12.2	Q
13-Feb	M	Measurement of Rw	Chap 13	
14-Feb	T			
15-Feb	W	SP log	Chap 6, all	Q
20-Feb	M	SP log		
21-Feb	T			
22-Feb	W	GR - intro, ops, uses	Chap 2, 2.1-2.5 Chap 7, all	Q
27-Feb	M	GR - effects, Vsh		
28-Feb	T			
29-Feb	W	induction - theory, ops	Chap 5, 5.5, 5.6	Q
5-Mar	M	induction - application		
6-Mar	T			
7-Mar	W		MIDTERM EXAM	
12-Mar	M	SPRING BREAK		
13-Mar	T	SPRING BREAK		
14-Mar	W	SPRING BREAK		
19-Mar	M	laterologs	Chap 5	
20-Mar	T			
21-Mar	W	laterologs		Q
26-Mar	M	porosity-density	Chap 2, 2.6-2.8	
27-Mar	T		Chap 8, all	
28-Mar	W	lithodensity		Q
2-Apr	M	porosity-Neutron	chap2, 2.9-2.12	
3-Apr	T		Chap 9, all	
4-Apr	W	Clean Fm Interpretation	Chap 14, all	Q

9-Apr	M	Clean Fm Interpretation		
10-Apr	T			
11-Apr	W	Clean Fm Interpretation		Q
16-Apr	M	Clean Fm Interpretation		
17-Apr	T			
18-Apr	W	porosity-sonic	Chap 3, all	Q
			Chap 10, all	
23-Apr	M	porosity-sonic		
24-Apr	T			
25-Apr	W	Gas-bearing Fm Eval	Chap 16, all	Q
30-Apr	M	Gas-bearing Fm Eval		
1-May	T			
2-May	W			
			FINAL EXAM	