

Undergraduate Council  
 New Course  Course Change *2008*  
 Core Category: None Effective Fall 2008

or

Graduate/Professional Studies Council  
 New Course  Course Change  
 Effective Fall \_\_

1. Department: CHE ENG College: ENGR

2. Person Submitting Form: Dr. Michael P. Harold Telephone: 34307

RECEIVED MAR 06 2008

3. Course Information on New/Revised course:

APPROVED OCT 22 2008

• Instructional Area / Course Number / Long Course Title:  
PETR / 2311 / Reservoir Petrophysics

• Instructional Area / Course Number / Short Course Title (30 characters max.)  
PETR / 2311 / RESERVOIR PETROPHYSICS

• SCH: 3.00 Level: SO CIP Code: 14.2501.00 Lect Hrs: 3 Lab Hrs: 0

4. Justification for adding/changing course: To provide for new discipline areas

5. Was the proposed/revised course previously offered as a special topics course?  Yes  No  
If Yes, please complete:

• Instructional Area / Course Number / Long Course Title:  
\_\_\_\_ / \_\_\_\_ / \_\_\_\_

• Content ID: \_\_\_\_\_ Start Date (yyyy3): \_\_\_\_\_

6. Authorized Degree Program(s): B.S. Petroleum Engineering

- Does this course affect major/minor requirements in the College/Department?  Yes  No
- Does this course affect major/minor requirements in other Colleges/Departments?  Yes  No
- Are special fees attached to this course?  Yes  No
- Can the course be repeated for credit?  Yes  No

7. Grade Option: Letter (A, B, C ...) Instruction Type: lecture ONLY (Note: Lect/Lab info. must match item 3, above.)

8. If this form involves a change to an existing course, please obtain the following information from the course inventory: Instructional Area / Course Number / Long Course Title  
\_\_\_\_ / \_\_\_\_ / \_\_\_\_

• Start Date (yyyy3): \_\_\_\_\_ Content I.D.: \_\_\_\_\_

9. Proposed Catalog Description: (If there are no prerequisites, type in "none".)

Cr: 3. (3-0). Prerequisites: MATH 1432 and PHYS 1322. Description (30 words max.): Systematic theoretical ~~and laboratory~~ study of lithology, porosity, effective permeability, relative permeability, fluid saturations, capillary characteristics, compressibility, rock stress and rock-fluid interactions.

10. Dean's Signature: \_\_\_\_\_ Date: 3/6/08

Print/Type Name: Joseph Tedesco, Dean

**UC 9781 08F**

**Cullen College of Engineering**  
**CBM003 Supplement - B Form** Page 2 of 5  
**(New Course)**

*Must be attached to CBM003 form*

|                       |                      |  |
|-----------------------|----------------------|--|
| Course: <u>PETR</u>   | <u>2311</u>          |  |
| <i>Subject Prefix</i> | <i>Course Number</i> |  |


1. **Course Title:** Reservoir Petrophysics  
*Print course inventory screen using RARCAS/CATM and attach.*
  
2. **Pre-requisite/Co-requisite:** MATH 1432 and PHYS 1322.
  
3. **Rational for Course Format:** Standard format
  
4. **Rational for Course Content:** Prepare the students for more advanced topics in petroleum engineering
  
5. **ABET Constituents consulted:** Petroleum Engineering Advisory Board, Three Industry Focus Groups
  
6. **State Course Outcomes:** Students learn physical rock properties that affect storage and flow of fluids in the reservoir, and how to apply these in quantitative calculations
  
7. **Course Performance after implementing format and content changes:** \_\_\_\_\_<sup>1</sup>
  
8. **Is course required?**                      X Yes                       No
  
9. **Required course outline attached?**    X Yes                       No
  
10. **Estimated student demand** 25 \_\_\_\_\_ per semester
  
11. **Similar courses in other departments:**  Yes                      X No  
     a. *If yes, list course(s)* \_\_\_\_\_
  
12. **Is course part of a sequence?**                       Yes                      X No  
     a. *If Yes, identify the sequence and comment on the relation to prior and subsequent courses:* \_\_\_\_\_

**Textbook(s) and other required materials:** Amyx, J. W., Bass, D.M., & Whiting, R. L., "Petroleum Reservoir Engineering" 3<sup>rd</sup> edition, McGraw-Hill Book Company, New York, NY, 1960

**Note:** Special Fees: If special fees requested, **Course Related Fee Request Form** will be required.

<sup>1</sup> Department reports will be requested about the effects of your new course on your curriculum both 12 and 24 months after the effective date for this new course.

Cullen College of Engineering **UC 9781 08F**  
CBM003 Supplement - B Fo. Page 3 of 5  
(New Course)

|   |         |  |
|---|---------|--|
|  | 2/21/08 | <input checked="" type="checkbox"/> Approved |
| Chair of Initiating Dept. Signature   | Date    |  |

PETR 2311  
Reservoir Petrophysics

Credits: 3

Prerequisites: MATH 1432 and PHYS 1322.

Description: Systematic theoretical and laboratory study of lithology, porosity, effective permeability, relative permeability, fluid saturations, capillary characteristics, compressibility, rock stress and rock-fluid interactions.

Text Book

Amyx, J. W., Bass, D.M., & Whiting, R. L., "Petroleum Reservoir Engineering" 3<sup>rd</sup> edition, McGraw-Hill Book Company, New York, NY, 1960

Course Objectives

To teach students those reservoir and fluid properties that affect the storage and flow capacity of the system and distribution of the fluids in the system. Furthermore, students will be able to apply these properties to make quantitative calculations, as well as develop data analysis skills and write and present reports.

| Topic   | Time, hrs |
|---|-----------|
| Introduction  | 1         |
| Porosity  | 3         |
| Rock Compressibility                                  | 1         |
| Darcy's Equation, Liquid and Gas Permeability         | 5         |
| Application of Darcy's Equation                       | 3         |
| Boundary Tension, Wettability, and Capillary Pressure | 8         |
| Fluid Saturations                                     | 3         |
| Electrical Properties                                 | 3         |
| Two- and- Three Phase Relative Permeability           | 8         |
| Statistical Analysis of Reservoir Data                | 2         |
| Special Topics  | 2         |
| Examinations  | 3         |
| <b>Total Hours</b>                                    | <b>42</b> |

Method of Evaluation

~~Laboratory Sessions~~ 25%  
Homework 79% **32%**  
Examinations 43%

Final Examination            25%  
Total                            100%

**Contributions to Professional Component**

1. **Petroleum Engineering:** Provides students a detailed understanding of rock and fluid properties of fluids in oil and gas reservoirs, an understanding of Darcy's law and how to apply it for computations of fluid flow in different flow geometries, measurement of rock and fluid properties in the laboratory, and a basic understanding of fluid flow in porous media.
2. **General Education:** students learn design of experiments, how to analyze and interpret experimental data and to prepare laboratory reports

**Relationship of Course Objective to Program Outcomes:**

| <b>Objective</b>  | <b>Program Outcome</b>   |
|---|--|
| Students learn properties of reservoir rock-systems affecting the storage and flow capacity of the system and distribution of fluids within the system. | Ability to apply knowledge of mathematics, science, and engineering. |
| Students will be able to apply these reservoir properties to quantitative calculations.   | Ability to identify, formulate and solve engineering problems.       |
| Students develop data analysis skills and will be able to report them in written form.  | Ability to communicate effectively.                                  |