CBM003 ADD/CHANGE FORM

1. Department: CHE ENG College: ENGR
2. Person Submitting Form: Dr. Michael P. Harold Telephone: 34307
3. Course Information on New/Revised course:
   - 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: SQ 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
Course: PETR 2311

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:  

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: ______


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

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1 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.
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

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.

<table>
<thead>
<tr>
<th>Topic</th>
<th>Time, hrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Porosity</td>
<td>3</td>
</tr>
<tr>
<td>Rock Compressibility</td>
<td>1</td>
</tr>
<tr>
<td>Darcy’s Equation, Liquid and Gas Permeability</td>
<td>5</td>
</tr>
<tr>
<td>Application of Darcy’s Equation</td>
<td>3</td>
</tr>
<tr>
<td>Boundary Tension, Wettability, and Capillary Pressure</td>
<td>8</td>
</tr>
<tr>
<td>Fluid Saturations</td>
<td>3</td>
</tr>
<tr>
<td>Electrical Properties</td>
<td>3</td>
</tr>
<tr>
<td>Two- and- Three Phase Relative Permeability</td>
<td>8</td>
</tr>
<tr>
<td>Statistical Analysis of Reservoir Data</td>
<td>2</td>
</tr>
<tr>
<td>Special Topics</td>
<td>2</td>
</tr>
<tr>
<td>Examinations</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>42</strong></td>
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Method of Evaluation

- Laboratory Sessions: 25%
- Homework: 25%
- 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:

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