CBM003 ADD/CHANGE FORM

☒ Undergraduate Council	or	☐ Graduate/Professional Studies Council
☒ New Course ☐ Course Change 2009		☐ New Course ☐ Course Change
Core Category: NONE Effective Fall 2008		Effective Fall __

1. Department: CHE ENG College: ENGR
2. Person Submitting Form: Dr. Michael P. Harold Telephone: 34307

RECEIVED MAR 0 6 2008

APPROVED OCT 2 2 2008

3. Course Information on New/Revised course:
   - Instructional Area / Course Number / Long Course Title: PETR / 3321 / Pressure Transient Testing
   - Instructional Area / Course Number / Short Course Title (30 characters max.) PETR / 3321 / PRESSURE TRANSIENT TESTING
   - SCH: 3.00 Level: JR 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): BS PETR ENGR
   - 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: PETR 2311, MECE 2334 and MATH 3321. Co-requisites: PETR 3211, ~~PETR~~ 3313, ~~&~~ PETR 3315. Description (30 words max.): Determination of reservoir permeability, pressure, and structural features from analysis of transient pressure data.
10. Dean's Signature [redacted] Date: 3/6/08

    Print/Type Name: Joseph Tedesco, Dean

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(New Course)

Must be attached to CBM003 form

Course: PETR 3321
Subject Prefix *Course Number*

1. **Course Title:** Pressure Transient Testing
   Print course inventory screen using RARCAS/CATM and attach.

2. **Pre-requisite/Co-requisite:** PETR 2311, MECE 2334, and MATH 3321. Co-requisites: PETR 3211, PETR 3313, & PETR 3315.

3. **Rational for Course Format:** Standard university course structure

4. **Rational for Course Content:** Continuation of learnings related to petroleum engineering

5. **ABET Constituents consulted:** Petroleum Engineering Advisory Board, Industry focus groups

6. **State Course Outcomes:** students learn how to determine reservoir characteristics from analysis of transient pressure data

7. **Course Performance after implementing format and content changes:**[1]

8. **Is course required?** X Yes ☐ No

9. **Required course outline attached?** XYes ☐ No

10. **Estimated student demand** 50 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:*_____

13. **Textbook(s) and other required materials:** J. Lee, J. Rollins, J. Spivey: *Well Testing*, SPE Textbook Series Vol. 9, 2003 plus class Notes

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

[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.

(New Course)

[redacted]	2/21/08	☑ Approved
Chair of Initiating Dept. Signature	Date	

UNIVERSITY OF HOUSTON
Department of Petroleum Engineering
PETR 3321 – Pressure Transient Analysis
Summer 2007

Prerequisites: PETR 2311, MECE 2334 and MATH 3321. Co-requisites: PETR 3211, PETR 3313, & PETR 3315.

Course Description: Determination of reservoir permeability, pressure and structural features from analysis of transient pressure data.

Textbook: J. Lee, J. Rollins, J. Spivey: *Well Testing*, SPE Textbook Series Vol. 9, 2003 plus class notes

Basis of Grading:

Homework	10%
Exams (2)	90%

1. Introduction to Well Testing
   a. Objectives of well tests
   b. Various types of well tests
2. Derivation of the diffusivity equation in 3D
   a. Cartesian coordinates
   b. Cylindrical coordinates
   c. Slightly compressible fluid (oil) and highly compressible fluid (gas)
3. Solutions to the diffusivity equation
   a. Line source solution
   b. Closed system
   c. Wellbore storage and skin
4. Principle of Superposition
   a. Superposition in space and time
   b. Semilog analysis
   c. Horner and superposition plots
5. Pressure derivative
   a. Development of pressure derivative for both drawdown and buildup
   b. Radius of investigation
6. Flow regimes
   a. Flow regime identification based on pressure derivative
   b. Radial, linear, spherical & bilinear flow regimes
7. Wellbore Storage
   a. Derive fundamental equation describing wellbore storage
   b. Discuss means of identifying wellbore storage from observed pressure response
8. Skin
   a. Derive equations to estimate skin from both drawdown and buildups
   b. Discuss various models used to represent skin (Hawkin's finite skin model and Van Everdingen and Hurst skin model)
9. Test Design

10. Hydraulically Fractured Wells
11. Horizontal Well Tests
12. Dual Porosity Reservoirs and Other Heterogeneity
13. Boundaries, PSS, Well Interference, and Interference testing
14. Gas Well Testing
15. Multiphase flow and multiple phases in the reservoir
16. Analysis of well tests with software package.

Learning Outcomes:

Outcome 1: Students will understand the derivation of the diffusivity equation applied to porous media and will learn how to solve the diffusivity equation for a range of boundary conditions.

Outcome 2: Students will learn how to estimate reservoir and completion parameters from a well test in addition to recognizing classical flow regimes.

Outcome 3: Students will learn how to analyze and simulate well test responses using a commercial well test software package.