Petroleum Engineering 648  
Pressure Transient Testing  
Syllabus and Administrative Procedures  
Spring 2010

Catalog Course Description:
Diffusivity equation and solutions for slightly compressible liquids; dimensionless variables; type curves; applications of solutions to buildup, drawdown, multi-rate, interference, pulse and deliverability tests; extensions to multiphase flow; analysis of hydraulically fractured wells.  
Prerequisites: PETE 324 and 620; approval of graduate advisor.

Instructor: Prof. Christine Ehlig-Economides  
Office: RICH 710  
Office Hours: By appointment  
Phone: 979 458-0797  
Email: caee@tamu.edu

Textbook:

Recommended Reading:
• R. Earlougher, Jr.: Advances in Well Test Analysis, SPE Monograph Vol. 5, 1977  
• SPE Reprint Series, No. 9: Pressure Analysis Methods, 1967.  
• SPE Reprint Series, No. 57: Pressure Transient Testing, V. I and II, 2004  

Course Requirements:
Homework/Teamwork 30%  
Exams 40%  
Team Project 30%  

Typically homework is assigned every week. Students will present homework solutions in class according to a random selection. Failure to be prepared to present when asked will reduce homework grade by 10%. Students must indicate ahead of time when they have a reason to miss class. Collaboration on homework is encouraged, and the class will be divided into teams. DL students must post their homework solutions by the homework due date.

There will be 2 in-class exams. Each DL student will need to return the completed exam by 5 pm on the following Monday according to instructions provided with the exam.
Each team will do a final project. The project will be assigned at the time of the first exam. Each team will present the project during the week following the last lecture class. The final project report is due the week after the project presentations.

**Course Objectives:**
1. Experience how well test models are derived and computed
2. Experience how to simulate pressure transient test behavior and how to design well tests*
3. Experience how to process, quality check, diagnose, and analyze pressure transient data
4. Understand the behavior of well and reservoir response patterns observed in well tests, what well and reservoir parameters can be quantified, and how to quantify them from pressure transient data*

*Using commercial software

**Course Outline**

<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Topic [Lecture Number]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction - Overview of the Course [1,2]</td>
</tr>
<tr>
<td>2</td>
<td>Modeling – Diffusivity Equation Derivation, Solutions; PTT Ch. 1, App. A, B [3]*</td>
</tr>
<tr>
<td>3</td>
<td>Modeling – Solution Implementation, Type Curves; PTT Ch. 4, App. F [4]*</td>
</tr>
<tr>
<td>4</td>
<td>Superposition; PTT Ch. 1-2, App. E [5]</td>
</tr>
<tr>
<td>5</td>
<td>Wellbore Storage and Skin; Index PTT wellbore storage, skin [6]</td>
</tr>
<tr>
<td>6</td>
<td>Flow Regimes; PTT App. G [7]</td>
</tr>
<tr>
<td>7</td>
<td>Test Design; PTT Ch. 8-11, App. K [8]</td>
</tr>
<tr>
<td>8</td>
<td>Exam I - In class</td>
</tr>
<tr>
<td>9</td>
<td>Spring Break</td>
</tr>
<tr>
<td>10</td>
<td>Gas Well Testing, Multiphase Testing; PTT Ch. 3, App. C [9,10] Naturally Fractured Reservoirs; PTT Ch. 7 [11]</td>
</tr>
<tr>
<td>11</td>
<td>Partial Penetration/Limited Entry; PTT Ch. 2 Sec. 2.4.5 [12]</td>
</tr>
<tr>
<td>12</td>
<td>Hydraulically Fractured Wells; PTT Ch. 6 [15]</td>
</tr>
<tr>
<td>13</td>
<td>Reservoir Limits [13]</td>
</tr>
<tr>
<td>14</td>
<td>Horizontal Wells; PTT Ch. 12 [14]</td>
</tr>
<tr>
<td>15</td>
<td>Final Exam - In class</td>
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</tbody>
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**Americans with Disabilities Act (ADA) Policy Statement**

The following ADA Policy Statement (part of the Policy on Individual Disabling Conditions) was submitted to the University Curriculum Committee by the Department of Student Life. The policy statement was forwarded to the Faculty Senate for information.

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Cain Hall or call 845-1637.

**Academic Integrity Statement**

“An Aggie does not lie, cheat, or steal or tolerate those who do.”
Definitions of Academic Misconduct [http://www.tamu.edu/aggiehonor/acadmisconduct.htm]

1. **Cheating**
   Intentionally using or attempting to use unauthorized materials, information, notes, study aids or other devices or materials in any academic exercise.

2. **Fabrication**
   Making up data or results, and recording or reporting them; submitting fabricated documents.

3. **Falsification**
   Manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

4. **Multiple Submissions**
   Submitting substantial portions of the same work (including oral reports) for credit more than once without authorization from the instructor of the class for which the student submits the work.

5. **Plagiarism**
   The appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

6. **Complicity**
   Intentionally or knowingly helping, or attempting to help, another to commit an act of academic dishonesty.