

PTE 517 Testing of Wells and Aquifers

Spring Semester 2017

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TA

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Thursdays

2:00-4:40 PM

	12-Jan	Basic Concepts-Operational Aspects-flow equations-Operational Risks
	19-Jan	Forward Methods Single Phase Source Flow Models , Boundary Effects
	26-Jan	Wellbore and Near Wellbore Effects-Formation Damage- Phase Separation
	2-Feb	Pressure Buildup and Pressure Drawdown/Derivative Method/Equivalent Time
	9-Feb	First Exam
	16-Feb	Inverse Methods for estimation of Permeability, Heterogeneity Effects, Composite Reservoirs
	23-Feb	Diagnostic Plots-Computer Aided Solution/Multi phase solution/Fractured Reservoirs
	2-Mar	Multiple Well test/Pulse and Interference Tests/Anisotropy
	9-Mar	Horizontal Wells/Injection Well Testing/Multi layered
	16-Mar	Spring Break- No Class
	23-Mar	Gas Wells Testing/Unconventional Reservoirs/minifrac tests
	30-Mar	Second Exam
	6-Apr	Measurement systems/Real Time Analysis/Test Design/DST
	13-Apr	Aquifer Tests/Numerical Well Testing/convolution/deconvolution/Trap
	20-Apr	Project presentation
	27-Apr	Review session
	4-May	Final Exam- 2-4 PM
Course Grade		
		Weekly Homework 15
		Exam 1 25
		Exam 2 25
		Final Exam 25
		Project 10

During the semester additional technical papers besides the list will be assigned for reading and analysis purposes

Books

text

Pressure Buildup and Flow Tests in Wells

C.S. Matthews and D. G. Russell

163 pp.; Softcover

SPE Monograph Series Vol. 1

text	Pressure Transient Testing John Lee, John B. Rollins and John P. Spivey 376 pp.; Softcover SPE Textbook Series, Vol. 9
reference	Transient Well Testing Medhat M. Kamal 850 pp; Softcover Monograph Series Vol. 23 Society of Petroleum Engineers

Reference Papers to Read pte 517 Sp 2017

- 1 Abdassah, D., & Ershaghi, I. (1986, April 1). Triple-Porosity Systems for Representing Naturally Fractured Reservoirs. Society of Petroleum Engineers. doi:10.2118/13409-PA
- 2 Acuna, J. A., Ershaghi, I., & Yortsos, Y. C. (1995, September 1). Practical Application of Fractal Pressure Transient Analysis of Naturally Fractured Reservoirs. Society of Petroleum Engineers. doi:10.2118/26959-PA
- 3 Al-Ghamdi, A., & Ershaghi, I. (1996, March 1). Pressure Transient Analysis of Dually Fractured Reservoirs. Society of Petroleum Engineers. doi:10.2118/26959-PA
- 4 Al-Hussainy, R., & Ramey, H. J. (1966, May 1). Application of Real Gas Flow Theory to Well Testing and Deliverability Forecasting. Society of Petroleum Engineers. doi:10.2118/1243-B-PA
- 5 Bourdet, D. (1989, January 1). Supplement to SPE 12777, Use of Pressure Derivative in Well-Test Interpretation. Society of Petroleum Engineers.
- 6 Carter, R. D. (1966, December 1). Pressure Behavior of a Limited Circular Composite Reservoir. Society of Petroleum Engineers. doi:10.2118/1621-PA
- 7 Ershaghi, I., Li, X., Hassibi, M., & Shikari, Y. (1993, January 1). A Robust Neural Network Model for Pattern Recognition of Pressure Transient Test Data. Society of Petroleum Engineers. doi:10.2118/102079-PA
- 8 Gringarten, A. C. (2008, February 1). From Straight Lines to Deconvolution: The Evolution of the State of the Art in Well Test Analysis. Society of Petroleum Engineers. doi:10.2118/102079-PA
- 9 Gringarten, A. C., & Ramey, H. J. (1973, October 1). The Use of Source and Green's Functions in Solving Unsteady-Flow Problems in Reservoirs. Society of Petroleum Engineers. doi:10.2118/102079-PA
- 10 Gringarten, A. C., & Ramey, H. J. (1973, October 1). The Use of Source and Green's Functions in Solving Unsteady-Flow Problems in Reservoirs. Society of Petroleum Engineers. doi:10.2118/102079-PA
- 11 Horner, D. R. (1951, January 1). Pressure Build-up in Wells. World Petroleum Congress.
- 12 Kamal, M. M. (1983, December 1). Interference and Pulse Testing-A Review. Society of Petroleum Engineers. doi:10.2118/10042-PA
- 13 Kamal, M. M., Pan, Y., Landa, J. L., & Thomas, O. O. (2005, January 1). Numerical Well Testing: A Method To Use Transient Testing Results in Reservoir Simulation. Society of Petroleum Engineers. doi:10.2118/10042-PA
- 14 Khachatoorian, R. A., Ershaghi, I., & Shikari, Y. (1995, September 1). Complexities in the Analysis of Pressure-Transient Response in Faulted Naturally Fractured Reservoirs. Society of Petroleum Engineers. doi:10.2118/16394-PA
- 15 Kuchuk, F. J. (1990, December 1). Applications of Convolution and Deconvolution to Transient Well Tests. Society of Petroleum Engineers. doi:10.2118/16394-PA
- 16 Martin, J. C. (1968, December 1). Partial Integration of Equations of Multiphase Flow. Society of Petroleum Engineers. doi:10.2118/2040-PA
- 17 Odeh, A. S., & Babu, D. K. (1990, March 1). Transient Flow Behavior of Horizontal Wells, Pressure Drawdown, and Buildup Analysis. Society of Petroleum Engineers. doi:10.2118/18802-PA
- 18 Ramey, H. J. (1975, October 1). Interference Analysis for Anisotropic Formations - A Case History (includes associated paper 6406). Society of Petroleum Engineers. doi:10.2118/5319-PA
- 19 Ramey, H. J., & Agarwal, R. G. (1972, October 1). Annulus Unloading Rates as Influenced by Wellbore Storage and Skin Effect. Society of Petroleum Engineers. doi:10.2118/3538-PA
- 20 Uldrich, D. O., & Ershaghi, I. (1979, October 1). A Method for Estimating the Interporosity Flow Parameter in Naturally Fractured Reservoirs. Society of Petroleum Engineers. doi:10.2118/7142-PA
- 21 Van Everdingen, A. F., & Hurst, W. (1949, December 1). The Application of the Laplace Transformation to Flow Problems in Reservoirs. Society of Petroleum Engineers. doi:10.2118/949305-G
- 22 Warren, J. E., & Root, P. J. (1963, September 1). The Behavior of Naturally Fractured Reservoirs. Society of Petroleum Engineers. doi:10.2118/426-PA
- 23 Wattenbarger, R. A., & Ramey, H. J. (1970, September 1). An Investigation of Wellbore Storage and Skin Effect in Unsteady Liquid Flow: II. Finite Difference Treatment. Society of Petroleum Engineers. doi:10.2118/14311-PA
- 24 Yaxley, L. M. (1987, December 1). Effect of a Partially Communicating Fault on Transient Pressure Behavior. Society of Petroleum Engineers. doi:10.2118/14311-PA

other references to review

<https://www.youtube.com/watch?v=hXJZnuK2r4c>

<http://www.petroleumprogrammer.com/wp-content/uploads/2014/10/Well-Testing-Fundamentals.pdf>

<https://www.youtube.com/watch?v=lZt-lA0Pjqc>

<https://pubs.usgs.gov/of/1980/0044/report.pdf>

<https://sjacs.usc.edu/students/academic-integrity/>

Academic Integrity

In cases involving alleged academic integrity violations, the appropriate action is initiated by the course instructor or appropriate university official.

14.10 INITIATING A COMPLAINT

If the instructor has reason to believe, based on observation or other evidence, that a student has violated the university academic integrity standards, he or she is encouraged to make reasonable attempts to meet with the student and discuss the alleged violation and the evidence which supports the charge. When necessary, such discussions may be conducted by telephone or electronic mail. In this meeting every effort should be made to preserve the basic teacher/student relationship. The student should be given the opportunity to respond to the complaint.

Instructor should assign a mark of “MG” until notification is received from the Office of Student Judicial Affairs and Community Standards that a final decision has been made.

Also, because the student may contest the allegation, he or she must be allowed to attend all classes and complete all assignments until the complaint is resolved.

14.11 SANCTION AND CONSEQUENCES

Unless the instructor withdraws the allegation, he or she may recommend an appropriate sanction for the violation.

Sanctions include but are not limited to: grade sanctions (e.g., “F” in course) and dismissal from the academic department. In addition, sanctions of suspension or expulsion from the university may be assessed through a review process when requested by the instructor, requested by the academic or administrative unit in which the violation occurred, or when indicated by university standards (such as the seriousness of the misconduct or the existence of previous academic violations by the student). Refer to Appendix A: Academic Dishonesty Sanction Guidelines, when determining which sanction is most appropriate for the violation.

Students may not withdraw from a course in which they have committed or have been accused of committing an academic integrity violation. Students found to have withdrawn from a course in which an academic integrity violation is alleged or

determined will be reenrolled in the course upon receipt of a violation report by the Office of Student Judicial Affairs and Community Standards.

Students found responsible for an act of academic dishonesty in a course in which they have participated but have not enrolled (auditing), will be retroactively enrolled and assigned an appropriate sanction.

Graduate students who are found responsible for academic integrity violations may be sanctioned more severely than Appendix A suggests.

Sanctions for second offenses by graduate or undergraduate students will be more severe and generally will include suspension or expulsion.

14.12 REPORTING VIOLATIONS

As soon as possible (preferably within 15 days but not later than one year from the date of discovery of the incident), the instructor will provide the Office of Student Judicial Affairs and Community Standards with a completed Academic Integrity Violation Form. The instructor likewise will make a reasonable attempt to provide a copy of the report to the accused student.

14.13 RESPONSE TO REPORT

Once a report of an Academic Integrity Violation has been submitted, the Office of Student Judicial Affairs and Community Standards will evaluate the report, confirm whether or not the accused student has a previous disciplinary record at the university, and notify the student of the allegation in writing. A copy of the notification will be sent to the instructor submitting the report and to his/her academic dean.

A. If further review is not required, the student will be notified of report received alleged violations and recommended sanctions. The student will also be given the opportunity to meet with a review officer from the Office of Student Judicial Affairs and Community Standards. During that meeting, the student has the opportunity to request further review of the matter, thus initiating the Administrative Review process. If no meeting or further review is requested, the matter will be considered complete and sanctions initiated.

B. If the incident requires further review (such as when an instructor or academic unit has requested additional sanctions, when a student has previously been found responsible for an academic dishonesty violation or when university standards indicate expulsion, suspension, revocation of degree or revocation of admission), the student is notified in writing and must meet with a review officer from the Office of Student Judicial Affairs and Community Standards as part of the Administrative Review process. At or following that meeting the director or designee will determine whether the matter may be appropriately resolved by Administrative Review, either Voluntary or Summary, or whether referral to a University Review Panel is warranted. The Administrative Review meeting with the Student Judicial Affairs review officer is the student's opportunity to present any information regarding the incident. If the student fails to respond to the written notice and to schedule an appointment with the designated review officer of the Office of Student Judicial Affairs and Community Standards, an administrative hold will be placed on the student's record prohibiting the student from performing registration transactions until an appointment is scheduled and completed ([see Section 10.10E](#)). In addition, a Summary Administrative Review may be conducted in absentia when a student fails to respond to initial notification ([see Section 12.05](#)).

C. As indicated, reviews may be requested by the accused student, by the instructor reporting the alleged violation, by the academic or administrative unit in which the alleged violation occurred or by the university in cases where the alleged behavior indicates expulsion, suspension, revocation of degree or revocation of admission. Appropriate review processes are Administrative Review or University Review ([see Section 12.00](#)).