

Course title and number      PETE 689 - Reservoir Characterization and Forecasting  
 Term (e.g., Fall 200X)      Fall 2010  
 Meeting times and location    T, 5:15-7:45 P.M., RICH 302

### Course Description and Prerequisites

Emphasis on geostatistical estimation/simulation and advanced mathematical inversion methods, integration of three important aspects of reservoir development and management: i) stochastic reservoir description, ii) reservoir model updating; and iii) model-predictive reservoir control and management.

Prerequisites: Graduate classification; basic familiarity with linear algebra, probability, statistics, differential and integral calculus and general reservoir engineering.

### Learning Outcomes or Course Objectives

The objectives of the course are for students to:

1. Cover statistical modeling of spatial uncertainty used for stochastic reservoir identification.
2. Combine various data sources and geological knowledge with conceptual models of geological continuity to construct predictive reservoir models for future reservoir development and management.
3. Overview a broad range of topics including spatial variability modeling, two-point and multi-point geostatistics, reservoir parameterization, production data integration and model-predictive reservoir control and management.

### Instructor Information

Name                                Dr. Behnam Jafarpour  
 Telephone number                (979) 845-0666  
 Email address                    behnam.jafarpour@pe.tamu.edu  
 Office hours                      Wednesday, 4:00-6:00 P.M. or by appointment  
 Office location                  401F Richardson Building

### Textbook and/or Resource Material

There is no required textbook for this course, however, a few main texts are listed as suggested references. Course handouts and reading material will be posted to the class shared folder on the PE server and the web for distance learning. In addition to lectures, there will be a few computational lab sessions for hands-on introduction to required geostatistical software packages, i.e. SGeMS, ECLIPSE, MATLAB and other software packages that are needed in this course.

### Grading Policies

Homework.....	(30%)
Midterm Exam.....	(30%)
Class Project.....	(40%)
Total.....	(100%)

### Grading Scale

A.....	90-100%
B.....	80-89%
C.....	70-79%
D.....	60-69%
F.....	0-59%

### Course Topics, Calendar of Activities, Major Assignment Dates

<u>Week</u>	<u>Topic</u>
1	Course Introduction and Review Material
2	Geostatistical Reservoir Description and Modeling; Review of Spatial Statistics, Linear Algebra
3	Linear Estimation and Kriging
4	Stochastic Simulation
5-6	Beyond Two-Point Geostatistics
7-9	Reservoir Model Updating Through Production Data Integration
10-11	Parameterization and Model Reduction
12	Reservoir Control and Management; Model Predictive Control (MPC)
13	MPC Formulations and Solutions
14	Project Presentations
15	Final Project Report

### Other Pertinent Course Information

#### Americans with Disabilities Act (ADA)

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 Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>

#### Academic Integrity

For additional information please visit: <http://www.tamu.edu/aggiehonor>

*"An Aggie does not lie, cheat, or steal, or tolerate those who do."*

