PETE 2060 Computing in Petroleum Engineering

Instructor: Arash Dahi   Fall 2010
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Office Hours: Tuesday 4:00-5:00, Thursdays 4:30-5:30
Class: T 3:00- 4:00
Computer Lab: TH [I] 1:30-3:00 [II] 3:00-4:30 [III] 10:30 12:00

Course Description

Overview of computer applications in petroleum engineering. Introduction to mathematical software, spreadsheets, and structured problem solving. Scientific programming languages. Input/output and arithmetic techniques, finite differences, interpolation, iteration and root solving, curve fitting, and integration.

Course Goal

The goal of this course is to introduce students to contemporary computation and improve systematic problem solving skills. Students will be acquainted with computing infrastructure components and terms. The main ideas of structured programming and algorithms, including modularity, data types, and numerical methods will be illustrated using Excel, MATLAB and VBA. Students will perform basic programming tasks such as integration, root solving, and iteration.

Course Orientation

The majority of the student's time should be spent outside the classroom solving homework on the computer. Problems from petroleum engineering will provide the link and motivation for the computational techniques introduced in class. The engineering, economics and physics of problems will not be fully explained, but will be covered in student's subsequent coursework.

Course Textbook

[CC] Chapra S.C., R.P. Canale, Numerical Methods for Engineers, Sixth Edition, McGraw Hill, ISBN 978-0-07-340106-5

[L] Larsen, R.W., *Engineering with Excel*, Prentice Hall, NJ, 3rd edition, 2008.

[M] Moore, H., MATLAB for Engineers, Prentice Hall, NJ, 2nd edition, 2009.

Lectures will cover topics from petroleum engineering. Lab sessions will be devoted to answering student questions and illustrating specific computer techniques.

Course Grading

HW:	25%
Midterm:	20%
Final:	25%
Quizzes	5%
Lab Assignments	25%

There will be regular homework assignments and computer labs, a midterm, and a final.