MATH 416 — Fall 2002

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Lectures	MWF 10:30 - 11:20, AQ 5014
Office hours	Wednesday, 8:30 - 9:15
	Friday 11:30am - 12:15pm

Recommended Text. Burden & Faires, *Numerical Analysis*, Nelson, 7th ed.

About the course... Since the advent of computers constructive approaches to mathematical problems have become increasingly important. If you want to send a rocket to the moon it is not sufficient to know that a trajectory exists, or to know some of its more general properties - you actually need numbers. Devising algorithms for solving mathematical problems (like differential equations in this example) is one of the main goals of numerical analysis. In general, all we can hope for is some approximate solution - to study how closely we can approximate the exact solution is another important task of numerical analysis.

Constructive mathematics has dealt with some of these questions even before computers became available. Of course, the work involved to run certain algorithms might have been prohibitive for 19th century mathematicians.

Computing. For your programming assignments you may use the UNIX computing facilities on Campus or microcomputers. The Assignment Lab facilities will be available to you. We have MATLAB, a simple to use software package for numerical calculations installed in the Assignment Lab. You may also use FORTRAN, or any other programming language, like PASCAL, or C/C++, or when possible, MAPLE. Your programs should be readable, clear, with short comments where appropriate.

Electronic Mailing List. There is a course mailing list, **math416-d1@sfu.ca**.

Prerequisites

Some computing experience. Caclulus, Differential Equations.

Exams	
Quiz # 1	Mon, October 21
Quiz # 2	Mon, November 25
Project due	Wed, November 27

Grading

Quizzes 25% each, homework 25%, project 25%.

Homework

There will be $N = 5 \pm 1$ homework assignments which are usually due on **Monday** before the Lecture. Your *homework grade* will be based partly on the number of problems you attempt to solve; only a small part of your homework will be marked, but solutions are made available. Typically, assignments will be handed out one or two weeks before they are due. Start working on your computer assignments early to be prepared for the unexpected. You are supposed to do your homework on your own. Receiving reasonable amount of help is o.k., as long as you indicate so on your problem set. We will not accept late homework.

Any homework you hand in should be short and easy to read. In computer assignments do *not* just hand in your raw output. Select the important output, or, if necessary, summarize by hand (tables, etc.). Use scissors and glue to put everything into a single stapled $8.5'' \times 11''$ booklet. Your handwritten comments or analysis can then be inserted at appropriate places. In programming assignments the discussion of your results is at least as important as the program. **Save** your programs. You might need them later in the course.

You may do all your **computer assignments**, and the project in groups of 2–3 students!

World Wide Web

Supplementary lecture notes, homework assignments and solutions will be made available on the Web, at the site listed below.

Please check the Math 416 course Web page for updates and news! URL:

http://www.math.sfu.ca/~mrt/Math416/

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