COURSE SYLLABUS

Sultan Qaboos University — College of Science

Department of Mathematics and Statistics

Numerical Analysis — **MATH 4141**

Instructor: Ziyad Al-Sharawi (Office 0224, Phone 24142215) — **Fall 2011**

Credit Hours: 3 — **Prerequisite:** Math2108 & Math2202

Contact Hours: 4 per week — **Format:** 2 Lectures and 2 Tutorials.

Textbook: R. Burden and J. Faires, Numerical Analysis, 7^{th} Edition, Brooks & Cole, 2001.

Office Hours: Saturday (9:00-09:50am), Sunday (11:00-11:50) and Tuesday (10:00–10:50am). Students are welcome to seek help during these office hours. Other than these office hours, visits to my office need an advanced appointment.

Course Description: This is an introductory course in Numerical Analysis. It is designed to be taught after Calculus II and a Linear Algebra course. We introduce the student to the following main topics: Numerical solutions of equations in one variable, Numerical solutions of nonlinear systems of equations, Numerical differentiation and integration, Numerical solutions of initial value problems in ordinary differential equations, and approximating eigenvalues of matrices.

Course Objectives: Upon completion of this course, students should be able to use appropriate numerical methods to find zeros of a function, numerical solutions to non-linear algebraic systems, numerical solution of initial value problems for ordinary differential equations, approximation of eigenvalues of matrices. Students should be able to find the rate of convergence in each method. Also, students are expected to be able to use MAPLE or MATLAB in writing appropriate codes for the numerical methods covered in this course.

Weekly Schedule: The next table gives a tentative weekly schedule.

Week & Start Date	Section	Week & Start Date	Section	Week & Start Date	Section
01: Sept. 17	2.1	06: Oct. 22	3.1, 3.2 (Exam 1)	11: Nov. 26	5.1,
02: Sept. 24	2.2, 2.3	07: Oct. 29	3.3, 4.1,	12: Dec. 03	5.2, 5.3 (Exam 2)
03: Oct. 01	2.4, 2.5	08: Nov. 05	4.3, 4.4	13: Dec. 10	5.4
04: Oct. 08	2.6	09: Nov. 12	4.5	14: Dec. 17	9.1
05: Oct. 15	10.1, 10.2	10: Nov. 19	4.7, 4.8	15: Dec. 24	9.2

Assessment: Total grades will be composed of the following weighted components:

Component	Number	Date/Time	Weight
Homework	3	One week from announcement	10%
Quizzes	3	One week from announcement	15%
Test I	1	Oct. 26, 2011 (Week 06)	15%
Test II	1	Dec. 07, 2011 (Week 12)	20%
Final Exam	1	Jan. 03, 2012 (Tue. 08:00-11:00)	40%

Final Grades[1]: Final grades are assigned according to the following percentage scale:

[1] If some final scores are close to a cut-off, the instructor may adjust the scale a little for the student's benefit.

- A, A^-: 100–92, 91–89 respectively.
- B^+, B, B^- : 88–85, 84–82, 81–79 respectively.
- C^+, C, C^-: 78–75, 74–70, 69–65 respectively.
- D^+, D, D^-: 64–60, 59–55, 54–50 respectively.
- F : 0–49.

If a student misses an exam or a quiz without a valid excuse, the mark in that test will be zero. Absentees with genuine reasons (supported by proper documents submitted to the instructor within one week from return to class) will be treated separately. However, there will be no make-up quizzes or exams under any circumstances. Any assigned grade will be based on the performance on the remaining part of that assessment components.

Success in Math 4141: Success in Math 4141 is most directly related to the following two factors. Deficiency in either of them is almost sure to result in unsatisfactory results in Math 4141.

1. Knowledge of the prerequisite material.
2. Student's efforts (class attendance, practicing homework, continuous preparation and study).

Graded Homework and Quizzes: Quizzes will be announced in class one week earlier. If a student misses a class, then he is responsible for whatever we discuss in that class. For each graded homework, you will be given one week to work it out. Your submitted homework must be stabled and neatly written.

Tutorial Problems and Homework Exercises: Some suggested exercises will be assigned for homework and weekly tutorial. The assigned exercises will be given to you chapter by chapter. Students are supposed to prepare and attempt those exercises at home. Tutorial time will be used to assist/guide you to overcome the difficulties in your assigned exercises. Also, the instructor may give some marks for doing the suggested exercises before the tutorial.

Computer Usage: Most of the topics in this course have two major components: The theoretical component and the applied component. Students are expected to make progress in both components. After the first week, our meetings will be held at one of the computer labs in which some CAS is available (MAPLE or MATLAB). Students will be taught the basics for writing codes in MAPLE or MATLAB, and students are expected to do certain assignments using MAPLE or MATLAB.

Attendance: Attendance is compulsory. Any student who misses 10% (6 contact hours) of the total course hours will be sent a warning notice, and who misses 20% (12 contact hours) or more of the total course hours will be barred from taking the Final Examination according to the University Regulations.

Punctuality: You are required to attend your class on time. Late attendance is not acceptable. The instructor has the right to close the door and not welcome those who are late.

Cellular Phones: Turn off your cellular phone before entering the class. Also, cellular phones are not allowed to be used as calculators or for any other purpose.

Academic Dishonesty: All forms of academic dishonesty are prohibited and penalties are decided depending on the department/university rules and regulations. Academic dishonesty includes (but not limited to) cheating, plagiarism, copying, collusion, falsification, signing for someone's else, . . . etc. For more details, please see pages 36 and 37 of SQU Undergraduate Academic Regulations, Third Edition, 2005.

Good Luck & Enjoy the Course