Course #: MATH 5329 (CRN 12698)  
Course Title: Numerical Analysis  
Credit Hours: 3  
Term: Fall 2014  
Course Meetings & Location: MW 10:30 ~ 11:50, Location: CRBL C302  
Prerequisite Courses: MATH 3323 and programming experience  
Course Fee (if applicable): None  
Instructor: Dr. Son-Young Yi  
Office Location: Chemistry and Computer Science Building 2.0320  
Contact Info: E-mail syi@utep.edu  
Phone 747-6864  
Office Hours: M 13:00 ~ 14:00, W 12:30 ~ 13:30  
Course Website http://www.math.utep.edu/faculty/yi/math5329f14.html  
Course Objectives  
(Learning Outcomes):  
1. the principle of numerical methods  
2. how to implement the methods in a computer language (MATLAB)  
3. how to apply these methods to application problems  
Course Activities/Assignments: Homework: There will be approximately 5 homework assignments this semester. Assignments will be posted on the course website and announced in class. Most of the homework problems will be from the textbook. No late homework will be accepted. Your homework should show all necessary work you used to solve problems and the reasoning and logic underlying all arguments should be clearly spelled out. Some homework assignments will involve computer programming. Computer projects must be done in MATLAB. For every assignment, turn in a complete printout of the program and of the output along with detailed explanation of solutions.  
Assessment of Course Objectives: Exams: There will be two midterm exams and a final exam. No books, notes, or graphing/graphical calculators will be allowed. A basic scientific calculator can be used, but will not be needed. No make-up/alternate exam will be given. More information will be coming up as the exam dates approach.  
Midterm exam I: Wednesday, Oct. 1.  
Midterm exam II: Wednesday, Nov. 5.  
Final exam: Friday, Dec. 12 from 10:00 am to 12:45 pm.
Course Schedule:

8/25: Course introduction,
    Section 1.2 Mathematical preliminaries,
8/27: Section 2.1: Floating-point numbers and round-off errors

9/1: Labor day - No class
9/3: Section 2.1 continued
9/8: Section 2.2: Absolute and relative errors
9/10: Section 2.3: Stable and unstable computations: Conditioning
9/15: Section 3.1: Bisection method
9/17: Section 3.2: Newton’s method
9/22: Section 3.3: Secant method
9/24: Section 3.4: Fixed point iteration
9/29: Section 4.1: Matrix algebra
    Section 4.2: LU and Cholesky factorization
10/1: Midterm I
10/6: Section 4.3: Pivoting and constructing an algorithm
10/8: Section 4.3-continued
    Section 4.4: Norms and the analysis of errors
10/13: Section 4.6: Solution of equations by iterative methods
10/15: Section 4.7: Steepest Descent and Conjugate Gradient methods
10/20: Section 6.1: Polynomial interpolation
10/22: Section 6.2: Divided differences
10/27: Section 6.3: Hermite interpolation
10/29: Section 6.4: Spline interpolation
11/3: Section 7.1: Numerical differentiation and
    Richardson extrapolation
11/5: Midterm II
11/10: Section 7.2: Numerical integration based on interpolation
11/12: Section 7.3: Gaussian quadrature
11/17: Section 8.2: Taylor-series method
11/19: Section 8.3: Runge-Kutta methods
11/24: Section 8.4: Multistep methods
11/26: Section 8.8: Boundary value problem: Shooting method
12/1: Section 8.9: Boundary value problem: Finite-Differences
12/3: Section 8.9 continued
12/12: Final exam @ 10:00 am ~ 12:45 pm
Grading Policy: Homework: 30%, Midterm exam: 40%, Final exam: 30%

Make-up Policy: No make-up/alternate exam will be given. If you have an emergency on the exam day, you have to contact me immediately.

Attendance Policy: It is student’s responsibility to attend every class. Students are expected to arrive for class on time and to remain for the class entire period.

Academic Integrity Policy: The University policy is that all suspected cases or acts of alleged scholastic dishonesty must be referred to the Dean of Students for investigation and appropriate disposition. Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. For further information, please refer to:
http://academics.utep.edu/Default.aspx?tabid=23785 or
http://www.lib.iastate.edu/commons/resources/facultyguides/plagiarism/dishonesty.html.

Civility Statement: Please do not use cell phones, pagers, IPods, MP3 players, blue tooth devices, etc. during class. Cell phones and pagers should be set to silent or vibrate, and any calls should be taken outside of class. Please do not wear headsets or blue tooth devices during class.

Disability Statement: If a student has or suspects she/he has a disability and needs an accommodation, he/she should contact the Disabled Student Services Office (DSSO) at 747-5148 or at <dss@utep.edu> or go to Room 106 Union East Building. The student is responsible for presenting to the instructor any DSS accommodation letters and instructions.

Military Statement: If you are a military student with the potential of being called to military service and/or training during the semester, please contact me by the end of the first week of class.