

**THE UNIVERSITY OF TEXAS AT EL PASO**  
COLLEGE OF SCIENCE  
**DEPARTMENT OF Mathematical Sciences**

Course #: MATH 5329  
Course Title: Numerical Analysis  
Credit Hrs: 3  
Term: Fall 2009  
Course Meetings & Location: BART 305  
Prerequisite Courses: MATH 3323 and programming experience  
Course Fee(if applicable) None  
Instructor: Dr. Son-Young Yi  
Office Location: Bell Hall 218  
Contact Info: E-mail syi@utep.edu  
Phone 747-6864

Office Hrs: TR 13:30 ~ 14:30  
Textbook(s), Materials: Numerical Analysis, Mathematics of Scientific Computing, Third Eds, by D. Kincaid and E. Cheney.

Course Website <http://www.math.utep.edu/faculty/yi/math5329f09.html>

Course Objectives  
(Learning Outcomes): The objectives of the class are to understand  
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 6 homework assignments this semester. Assignments will be posted on this 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 one midterm exam and a final exam. No books, notes, or graphing/programmable 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. The midterm is scheduled for **Thursday, Oct. 15 in class** and the final exam is scheduled for **Thursday, Dec. 10 from 10:00 to 12:45.**

Course Schedule:

**8/25:** Course introduction,  
Section 1.2 Mathematical preliminaries,  
**8/27:** MATLAB demonstration  
**9/1:** Section 2.1: Floating-point numbers and  
roundoff errors  
**9/3:** Section 2.2: Absolute and relative errors  
**9/8:** Section 2.3: Stable and unstable computations:  
Conditioning  
**9/10:** Section 3.1: Bisection method  
**9/15:** Section 3.2: Newton's method  
**9/17:** Section 3.3: Secant method  
**9/22:** Section 3.4: Fixed point iteration  
**9/24:** Section 4.1: Matrix algebra  
**9/29:** Section 4.2: LU and Cholesky factorization  
**10/1:** Section 4.3: Pivoting and constructing an  
algorithm  
**10/6:** Section 4.4: Norms and the analysis of errors  
**10/8:** Section 4.6: Solution of equations by  
iterative methods  
**10/13:** Review/Catch-up  
**10/15: Midterm exam**  
**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:** Section 7.2: Numerical integration based on  
interpolation  
**11/10:** Section 7.3: Gaussian quadrature  
**11/12:** Section 8.2: Taylor-series method  
**11/17:** Section 8.3: Runge-Kutta methods  
**11/19:** Section 8.4: Multistep methods  
**11/24:** Section 8.5: Local and global errors:  
Stability  
**11/26: No class (Thanksgiving holiday)**  
**12/1:** Section 8.9: Boundary value problems: Finite  
differences  
**12/3:** Review/Catch-up  
**12/10: Final exam**

Grading Policy:	Homework: 40%, Midterm exam: 30%, Final exam: 30%
Make-up Policy:	<b>No make-up/alternate exam</b> 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: <a href="http://academics.utep.edu/Default.aspx?tabid=23785">http://academics.utep.edu/Default.aspx?tabid=23785</a> or <a href="http://www.lib.iastate.edu/commons/resources/facultyguides/plagiarism/dishonest.html">http://www.lib.iastate.edu/commons/resources/facultyguides/plagiarism/dishonest.html</a> .
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.