ET 7450
Methods of Engineering Analysis II

Course Description:

This course aims to provide the knowledge of computer applications and numerical methods for differentiation, integration, solving differential equations, curve fitting, approximation of function, fast Fourier transform and spectrum analysis. This course also encourages students to use software programming environments to solve numerical problems. The software environments to be taught have become industrial standards, especially in the areas of calculation, data acquisition and control systems, making it important for students to know how to utilize them.

Course Instructor: Dr. Ching-Ming Chen,
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ETB 1150

Credit Hours:

4 Credit Hours.

Class Meet Time:

Tuesday 05:30PM - 09:10PM

Office Hours:

Tuesday 04:30PM - 05:30PM
Appointment by email

Prerequisite(s):

ET 2160 – Computer Applications for Engineering Technology
ET 3430 – Applied Differential and Integral Calculus.

Co-requisite(s): None.

Textbook(s) Recommended:

Applied Numerical Methods with MATLAB for Engineers and Scientists, S.C. Chapra
Applied Numerical Methods for Engineers using MATLAB and C, R.J. Schilling and S.L. Harris
Mastering Simulink 2, J.B. Dabney and T.L. Harman

Computer Programs:

C and MATLAB/Simulink

Course Objectives:

Upon completion of this course the student will be able to:

1. Using *MatLab* and *C* to solve problems by the following numerical methods.
2. Solving Nonlinear Equations
3. Solving Set of Equations: Gauss and Gauss-Jordan Method
4. Knowing Interpolating Polynomials
5. Calculating Numerical Differentiation
6. Numerical Integration
7. Numerical Solution of Ordinary Differential Equations
8. Numerical Solution of Partial-Differential Equations
9. Curve Fitting by Least-Square-Error Method
10. Fast Fourier Transform and Spectrum Analysis

Topics and Schedule: (template)

Date	Topic	Chapter
1/10	Introduction	
1/17	Matrices and Linear Algebra	
1/24	Multiple-variable Equations	
1/31	Non-linear Equations	
2/07	Roots Finding	
2/14	Polynomials	
2/21	Test	
2/28	Numerical Diiferentiation	
3/07	Numerical Integration	
3/14	Spring Break	
3/21	Ordinary Differential Equations	
3/28	Partial Differential Equations	
4/04	Curve Fitting	
4/11	Fourier Expansion and Signal Analysis	
4/18	Simulink Applications	
4/25	Study day	
4/26-5/02	Final Exam	

Grading Policy:

Test 1	20%
Final	30%
Homework	50%

Grading Scale:

A	93-100	A-	90-92		
B+	87-89	B	83-86	B-	80-82
C+	77-79	C	73-76	C-	70-72
D+	67-69	D	63-66	D-	60-62
F	Below 60				

ATTENDANCE & PARTICIPATION:

Lecture and laboratory attendance is an important mechanism for achieving course objectives and is also vital to students' success in the class. Students are expected to attend all class meetings and labs and will be held responsible for material presented and verbal announcements made during class.

WITHDRAWAL POLICY:

Last day to drop with a tuition refund: End of 2nd Week of Semester
Last day to drop without a notation of W on the transcript: End of 4th Week
Final day to drop with W (ET Students): End of 10th Week

Depending on the situation of withdrawal, one of the following grades will be assigned:
WP: Withdrawal with Passing
WF: Withdrawal with Failing
WN: Withdrawal Never Attended

All drop/add activity during the first four weeks should be done by the student through Pipeline. Withdrawal after the fourth week requires the instructor's permission and must be submitted on a Drop/Add form to the Registrar's Office. Withdrawal after the 'final drop' date will only be permitted under exceptional circumstances and requires the permission of the Chair of the ET Division. A failing grade is not an acceptable reason for withdrawal after the 'final drop' date.

ETHICS AND CHEATING

Academic Integrity is demanded in this course and cheating will be prosecuted according to University & College policy (see section 10 of the Student Code of Conduct: http://www.doso.wayne.edu/judicial/index.htm).

Cheating includes but is not limited to GIVING or RECEIVING unauthorized help on an examination. Cheating includes the use of unauthorized material during an examination or submitting material on the lab reports or course projects which is not the result of the student's own effort. Cheating also includes plagiarism – avoid even grey areas of plagiarism. See http://www.otl.wayne.edu/cheating.html

AVAILABILITY TO STUDENTS WITH DISABILITIES

If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, the instructor will meet with you privately to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University. Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.