

DREXEL UNIVERSITY
Department of Mechanical Engineering & Mechanics
Applied Engineering Analytical & Numerical Methods III
MEM 593 - Spring 2015

General Information

Class hours: Thursday, 6:30-9:20 PM, Curtis 340

Web Site: <https://learn.dcollege.net>

Instructor

Antonios Kontsos, akontsos@coe.drexel.edu, (215) 895 2297

Office hours: Wednesday 4:30-5:30 PM, Alumni Engineering Labs 172A or by appointment

Teaching Assistant

Ian Bakst inb27@drexel.edu

Office hours: Monday 5:00-6:00 PM and Tuesday 1:00-2:00 PM, Alumni Engineering Labs 174 E or by appointment

Objectives

This course focuses on two major topics: complex and probabilistic analysis. Emphasis is given in engineering applications of this material. In the presentation of complex analysis, the concepts of complex numbers and plane, functions of a complex variable, analytic functions (Cauchy-Riemann equations), complex integration (Cauchy's integral theorem/formula) and residue integration method are presented. Related to probabilistic analysis, a series of tools used in engineering mechanics including: probability space, conditional probability, random variables and their distributions, random number generation/sampling from a probability density function, Monte Carlo method and random processes. Homework problems and exams aim at the comparative evaluation of the various schemes discussed in class.

Programming

A major goal of this course series is to assist the students develop scientific programming capabilities in addition to their analytical skills. Although some of the material presented in class will be suitable for implementation using any programming language, MATLAB will be preferred. If you need some help with the software please consult the following links:

http://www.mathworks.com/academia/student_center/tutorials/launchpad.html

Grading

Homework	20%
Midterm	40%
Final	40%

Homework and Exams

Homework will be assigned every week after class. Late homework will not be graded. One midterm exam will be assigned in-class and during regular class hours on 04/30/15. A non-cumulative final exam will be given at the same time and location with regular class meetings on 06/11/15. This is a graduate level course and students are expected to develop high professional ethics standards. Any indication of academic misconduct, cheating, fabrication and plagiarism will automatically result to a failing grade in this course (http://www.drexel.edu/provost/policies/academic_dishonesty.asp).

Books-References

There is a required textbook for this class: Kreyszig, E., *Advanced Engineering Mathematics*, 10th edition, Wiley, 2011. For further reading, use any of the books of the following list. Books 1-3 have been also reserved in Hagerty Library (inquire by course or instructor's name).

1. Trefethen, L. N. and Bau, D. III, *Numerical Linear Algebra*, SIAM, 1997
2. Süli, E. and Mayers, D. F., *An Introduction to Numerical Analysis*, Cambridge, 2003
3. Greenberg, M. D., *Foundations of Applied Mathematics*, Prentice-Hall, 1978
4. Korn, G. A. and Korn, T. M., *Mathematical Handbook for Scientists and Engineers*, Dover, 2000

Student with disabilities requesting accommodations and services at Drexel University need to present a current accommodation verification letter (AVL) to faculty before accommodations can be made. AVL's are issued by the Office of Disability Services (ODS). For additional information, contact ODS at www.drexel.edu/ods, 3201 Arch St., Street, Suite 210, Philadelphia, PA 19104, 215.895.1401 (V), or 215.895.2299 (TTY).