

ASE 380P 2-ANALYTICAL METHODS II
EM386L MATHEMATICAL METHODS IN APPLIED MECHANICS II
CSE 386L MATHEMATICAL METHODS IN APPLIED ENGINEERING AND
SCIENCES

Spring 12, # 13505/ # 13900/ # 64430 , TTh 8:00 - 9:30, ENS 145

Text: M. D. Greenberg, *Foundations of Applied Mathematics*, Prentice-Hall, Inc., Englewood Cliffs, New Jersey 1978.

Week	Topic	Chapter
Jan 17 -Jan 20	Directional and partial derivatives. Differentials. Taylor's Theorem. Curvilinear systems of coordinates.	7
Jan 23 - Jan 27	Grad, curl and div operators in curvilinear coordinates.	
-	Area, volume, line and surface integrals.	8
Jan 30 -Feb 3	Gauss' and Stokes Theorems.	9
Feb 6 -Feb 10	Elementary calculus of variations.	10
Feb 13 -Feb 17	Elementary calculus of variations, cont. Lagrange multipliers.	10
Feb 20 -Feb 24	Complex numbers, Euler's formula, functions of complex variable, complex differentiability, multi-valued functions, branch cuts.	11,12
Feb 27 - Mar 2	Complex integral, Cauchy Integral Theorem, Taylor and Laurent expansions, radius of convergence.	13,14
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Mar 5 -Mar 9	The Residue Theorem and contour integration.	15
Mar 19 -Mar 23	Evaluation of (inverse) Laplace and Fourier transforms. Conformal maps.	15,16
Mar 26 -Mar 30	Self-adjoint operators. Review of Sturm-Liouville Theorem.	20
Apr 2 -Apr 6	Separation of variables. Lots of examples.	26
Apr 9 -Apr 13	Separation of variables and Fourier transform - cont.	26
Apr 16 -Apr 20	Characteristics and classification of second order PDE's.	27
Apr 23 -Apr 27	Green's functions. Perturbation techniques.	28
Apr 30 -May 4	Review and outlook at numerical methods.	29

Discussion Session: ACES 6.304, Thu, 5:30 - 7:00 pm.

Homework: Homework assignments will be made in class. The problems assigned in the class will not be collected. Instead, we will begin each discussion session with a quizz for which one of the homework problems will be selected.

Exams: There will be three (closed book) exams held in ACES 6.304, during evening hours (5:00-8:00 p.m.) according to the following schedule:

- Exam 1 (Sections 7,8,9,10) Mon., Feb 27,
- Exam 2 (Sections 11,12,13,14,15,16) Mon., Apr 2,
- Exam 3 (Sections 20,26,27,28,29) Mon., Apr 30,

Final Exam: Comprehensive, mandatory, closed book, in ACES 6.304, on Tuesday, May 15, 2:00-5:00 pm.

Final Grade: Is based upon the final score.

Final score range	grade
85 - 100	A with recommendation letter
75 - 85	A
72 - 74	A-
68 - 71	B+
65 - 67	B
62 - 64	B-
58 - 61	C+
55 - 57	C
52 - 54	C-
48 - 51	D+
45 - 47	D
42 - 44	D-
00 - 41	F

The final score is a weighted average of the test score, three mid-term exams and the final exam, with the following weights:

Tests (homework)	- 20 %
Exams	- 15 % each
Final	- 35 %

Instructor: Dr. Leszek Demkowicz, ACES 6.326, Office hours: Fri., 12:30-2:00 p.m.