

ME 616: Matrix and Tensor Method (Tentative Syllabus)

Students are expected to have completed the usual sequence of calculus courses as well as differential equations, and to have a sound knowledge of these subjects. In addition, some understanding of basic linear algebra is also required. If you need to review this material, it is strongly suggested that this be done during the summer in order to be fully prepared for the course this fall. There is a substantial amount of material that must be covered in ME 616.

A revised syllabus appears below.

Required Text: *Advanced Calculus for Applications* by F. R. Hildebrand, 2nd Edition (Prentice-Hall)
Mechanics Lecture Notes Part III: Foundations of Continuum Mechanics, Chapter 1: Vector and Tensors
(http://homepages.engineering.auckland.ac.nz/~pkel015/SolidMechanicsBooks/Part_III/index.html)

Course Grade: Based on the midterms and final exams. Solutions to assigned problems will either be done in class, or e-mailed.

Week	Topic	Reading	Homework ¹
1 to 5	Vector and Tensors – Part 1	Notes (E-mailed) Kelly (1.3, 1.5, 1.6, 1.8)	To be E-mailed to Class Selected problems from Kelly's book
		Hildebrand (6.17, 6,18)	Ch. 6 (103, 104)
6	Mid-Term Exam (Closed Book/Notes)		
7 to 9	Tensor Algebra	E-mail notes + Kelly (1.8, 1.9, 1.10)	Selected problems from Kelly's book
10	Mid-Term Exam 2 (Closed Book/Notes)		
7	Series Solutions of Differential Equations	4.1 – 4.3	Pg. 169: 5, 7, 11
8	Method of Frobenius	4.4	Pg. 171: 16, 17; Pg. 175: 42, 43
9	Frobenius: Exceptional Cases	4.5, 4.6	Pg. 173: 24, 25
10	Special Equations: Bessel, Legendre, ...	4.7, 4.8, 4.12	Pg. 182: 63, 64
15	Final Exam (Closed Book/Notes)		

¹ These are the suggested problems for the course. Students are encouraged to work on other problems in the text.