OFFICIAL SYLLABUS

MATH 355-ENGINEERING MATHEMATICS

(effective Fall 2012)

Textbook Committee: C. Lu, G. Pelekanos, K.H. Leem and M.-S. Song

Catalog Description. Linear Algebra: Gaussian elimination, linear independence, vector spaces, eigenvalues; Discrete Mathematics: combinations, graph theory; and Complex Analysis: differentiation, integration, series. **Prerequisite:** MATH 305

Textbook: *Advanced Engineering Mathematics 4th edition*, by Dennis G. Zill, Warren S. Wright

Detailed Outline:

Week	Topics	Sections in Adv. Eng. Math
1	Basic properties of matrices and Gaussian elimination. Review of 305	8.1, 8.2
2	Rank of a matrix, linear independence, vector spaces and solutions of linear systems.	8.3, 7.6
3	Determinants. Properties of determinants.	8.4, 8.5
4	Inverse of a matrix, Gauss-Jordan elimination and Cramer's rule.	8.6, 8.7
5	The eigenvalue problem and powers of matrices.	8.8, 8.9
6	Orthogonal matrices, approximation of eigenvalues, diagonalization and similarity of matrices.	8.10-8.12
7	Complex numbers, polar form of complex numbers, powers and roots and complex plane.	17.1, 17.2
8	Functions of a complex variable, derivative and analytic functions. Cauchy-Riemann equation and harmonic function.	17.4, 17.5
9	Exponential and logarithmic functions, trig and hyperbolic functions.	17.6, 17.7
10	Contour integrals and Cauchy-Goursat Theorem	18.1, 18.2
11	Independence of path and Cauchy's integral formulas.	18.3, 18.4
12	Sequences and series and Taylor Series	19.1, 19.2
13	Laurent series. Zeroes and poles (briefly).	19.3, 19.4
14	Residues and Residue Theorem.	19.5
15	Evaluation of eeal integrals.	19.6

Any instructor should cover all of the material specified, additional sections are optional