Engineering

**ENGR 2300** Linear Algebra for Engineers (3 semester hours) Matrices, vectors, linear systems of equations, Gauss-Jordan elimination, LU factorization and rank. Vector spaces, linear dependence/independence, basis, and change of basis. Linear transformations and matrix representation; similarity, scalar products, orthogonality, Gram-Schmidt procedures, and QR factorization. Determinants: eigenvalues, eigenvectors, and diagonalization. Introduction to problem solving using MATLAB. This course includes a required laboratory. Students cannot get credit for both **ENGR 2300** and **MATH 2418**. Pre- or corequisite: **MATH 2414** or **MATH 2419**. (2-1) S

**ENGR 3300** Advanced Engineering Mathematics (3 semester hours) Survey of advanced mathematics topics needed in the study of engineering. Topics include review of complex numbers, multivariate calculus and analytic geometry. Study of polar, cylindrical, and spherical coordinates, vector differential calculus, vector integral calculus, and vector integral theorems. Examples are provided from electromagnetic, fluid mechanics, physics and geometry. Prerequisite: **MATH 2415** or **MATH 2419**. (3-0) S

**ENGR 3341** Probability Theory and Statistics (3 semester hours) Axioms of probability, conditional probability, Bayes theorem, random variables, probability density/mass function (pdf/pmf), cumulative distribution function, expected value, functions of random variables, joint, conditional and marginal pdfs/pmf for multiple random variables, moments, central limit theorem, elementary statistics, empirical distribution correlation. Students cannot get credit for both (**CS 3341** or **SE 3341** or **STAT 3341**) and **ENGR 3341**. Prerequisite: **MATH 2414** or **MATH 2419**. Recommended co-requisite: **MATH 2420**. (3-0) S

**ENGR 4334** Numerical Methods in Engineering (3 semester hours) Computer arithmetic and error analysis. Solution of linear equations, roots of polynomial equations, interpolation and approximation, numerical differentiation and integration, solution of ordinary differential equations. Emphasis on engineering applications and numerical software. Students cannot get credit for both (**CS 4334** or **MATH 4334**) and **ENGR 4334**. Prerequisites: **ENGR 2300** and **ENGR 3300** and knowledge of a high level programming language. (3-0) Y

**ENGR 4343** Engineering Economy (3 semester hours) The objective of this course is to introduce undergraduate students to economic evaluation and analysis of engineering projects and proposals. Economic tools are essential for planning and design of engineering systems in today's ever-changing high-tech world. This course will also prepare the electrical engineering students for the "Engineering Economy" portion of the Fundamentals of Engineering Exam required for the professional engineer's license. Prerequisites: **MATH 2413** or **MATH 2417** and upper-division standing. (3-0) T