



Fall 2008 Distance Learning Courses

Classes Begin Tuesday, August 26, 2008

ECE 613 – *Communications Systems Engineering*; M/W, 3:30-4:45 p.m.; Instructor: Stephen G. Wilson (434-924-6091 – sgw@virginia.edu)

A first graduate course in principles of communications engineering. Topics include a brief review of random process theory, principles of optimum receiver design for discrete and continuous messages, matched filters and correlation receivers, signal design, error performance for various signal geometries, M-ary signaling, linear and nonlinear analog modulation, and quantization. The course also treats aspects of system design such as propagation, link power calculations, noise models, RF components, and antennas. (Prerequisite: Undergraduate course in probability)

MAE 641 – *Engineering Mathematics I*, M/W, 5:00-6:15 p.m.; Instructor: William W. Roberts, Jr. (434-924-6216 – wwr@virginia.edu)

Review of ordinary differential equations. Initial value problems, boundary value problems, and various physical applications. Linear algebra, including systems of linear equations, matrices, eigenvalues, eigenvectors, diagonalization, and various applications. Scalar and vector field theory, including the divergence theorem, Green's theorem, and Stokes theorem, and various applications. Partial differential equations that govern physical phenomena in science and engineering. Solution of partial differential equations by separation by variables, superposition, Fourier series, variation of parameter, d'Alembert's solution. Eigenfunction expansion techniques for non-homogeneous initial-value, boundary-value problems. Particular focus on various physical applications of the heat equation, the potential (Laplace) equation, and the wave equations in rectangular, cylindrical, and spherical coordinates. (Prerequisite: Graduate standing)

MAE 602 – *Continuum Mechanics*, M/W, 6:30-7:45 p.m.; Instructor: Matthew Begley (434-243-8728 – mrb3h@virginia.edu)

Introduction to continuum mechanics and mechanics of deformable solids. Topics include Vectors and cartesian tensors, stress, strain, deformation, equations of motion, constitutive laws, introduction to elasticity, thermal elasticity, viscoelasticity, plasticity, and fluids.

CE 683 – *Prestressed Concrete*, M/W, 8:00-9:15 p.m.; Instructor: Rodney Davis (434-293-1939 – Rodney.Davis@vdot.virginia.gov)

Analyzes prestressing materials and concepts, working stress analysis and design for flexure, strength analysis and design for flexure, prestress losses, design for shear, composite prestressed beams, continuous prestressed beams, prestressed concrete systems concepts, load balancing, slab design. (Prerequisite: Undergraduate design of concrete structures or equivalent)

ChE 665 – *Techniques for Chemical Engineering Analysis & Design*, T/Th, 3:30-4:45 p.m.; Instructor: John L. Hudson (434-924-6275 – hudson@virginia.edu)

Methods for analysis of steady state and transient chemical engineering problems arising in fluid mechanics, heat transfer, mass transfer, kinetics, and reactor design. (Prerequisite: Undergraduate differential equations, transport processes, and chemical reaction engineering.)

MSE 601 – *Electronic and Crystal Structure of Materials*, T/Th, 5:00- 6:15 p.m.; Instructor: James M. Howe (434-982-5646 – jh9s@virginia.edu)

Provides a fundamental understanding of the structure and properties of perfect and defective materials. Topics include: crystallography and crystal structures, point defects in materials, properties of dislocations in f.c.c. metals and other materials, surface structure and energy, structure and properties of interphase boundaries. (Prerequisite: Instructor permission)

MSE 614 – *Magnetism and Magnetic Materials*, T/Th, 6:30-7:45 p.m.; Instructor: William Soffa (434-243-2532 – was2n@virginia.edu)

This is a fundamental course on the principles governing the behavior of modern magnetic materials employed in technology from transformer materials to permanent magnets and magnetic recording including such new areas as nanomagnetism. The approach integrates the basic physics of magnetism with the materials science and the subject matter is developed at a level to enable students to understand magnetism and magnetic materials at the forefront of the field and to readily read the current research and technological literature.

SYS 605 – *Stochastic Systems*, T/Th, 8:00-9:15 p.m.; Instructor: Preston White (434-982-2070 – kpw8h@virginia.edu)

Covers basic stochastic processes with emphasis on model building and probabilistic reasoning. The approach is non-measure theoretic but otherwise rigorous. Topics include a review of elementary probability theory with particular attention to conditional expectations; Markov chains; optimal stopping; renewal theory and the Poisson process; martingales. Applications are considered in reliability theory, inventory theory, and queuing systems. (Prerequisite: Undergraduate probability and statistics, or equivalent background in applied probability and statistics)