

Electrical Engineering Tract Course Descriptions

EECE 5310 – Control Systems

Review of continuous-time linear systems. Time-domain system analysis. Time-domain design of lead/lag and PID controllers. Root-Locus technique. Frequency-domain system analysis including Nyquist, Bode, and Nichols analysis and relative stability. Frequency-domain design/lag and PID controllers. Design Elective.

EECE 5460 – Sensor Devices: Theory, Design and Applications

Sensor classification and transduction principles. Fundamental principles and theory of operation of various types of sensors, based on various technologies which include optical, electrical, acoustical, thermal, magnetic, mechanical and chemical. Analysis of sensor signals. Study of sensor characteristics which include hysteresis, non-linearity, saturation, repeatability, sensitivity, selectivity and resolution. Design and practical implementations of various sensors for scientific, industrial and consumer applications. Design elective.

EECE 6430 – Microelectromechanical Systems and Sensors

Overview of microelectromechanical-MEMS-transducers and sensors. Basic engineering sciences and fundamental principles relevant to mechanical sensors and micromachined mechanical transducers. Mathematical models and design of microelectromechanical systems. Microfabrication techniques, materials and processes. Mechanical transduction techniques, pressure sensors, force and torque sensors, inertial sensors, flow sensors, micromachined resonant sensors, micromachined chemical sensors. Prereq: Basics of electromagnetics and solid state physics or consent of instructor.

EECE 6810 Algorithm Analysis and Applications

Introduction to the analysis of algorithms. Topics include: asymptotic complexity notation, recursion analysis, basic and advanced data structures, sorting methodologies, dynamic programming, and graph algorithms, including heuristic search techniques such as best-first and A-star algorithms. Advanced topics include NP-completeness theory and linear programming. Prereq: EECE 2710 or equiv and MATH 1451 or equiv.; or EECE 2710 or equiv. and COSC 2010 or equiv. and MATH 1451 or equiv.

ENMA 6040 – Lean Manufacturing Systems

Focuses on designing, implementing, and optimizing high-performance cost-effective manufacturing systems. Lean, mass, and craft production paradigms will be compared, with emphasis placed on the benefits and implementation of the lean principles of value stream, flow, pull, and waste. Student teams prepare, analyze, and propose optimized value streams for real-world manufacturing systems.

ENMA 6070 – Engineering Project Management

Applies collaboration tools such as MS Project to organize and direct global virtual teams developing technology-based products and services. Focus is on optimizing projects under the triple constraints of time, resources, and quality. Student projects provide hands-on experience in applying tools and methods to balance multiple and varying constraints in a real-world environment.