### Courses

**EE 5513 Techniques of Computer-Aided Circuit Analysis and Design: 3 semester hours.**

Automatic formulation of equations and fundamental programming techniques pertinent to computer-aided circuit analysis, design, modeling. May include sensitivity calculations, system analogies, optimization. PREREQ: EE 3340 and EE 3342.

**EE 5516 Applied Engineering Methods: 3 semester hours.**

Applied discrete and continuous probability, random variables, probability distributions, sampling, data description, parameter estimation, hypothesis testing, inference, correlation and linear and multiple regression. P

**EE 5517 Probabilistic Signals and Systems: 3 semester hours.**


**EE 5518 Communication Systems: 3 semester hours.**

Basic principles of analysis and design of modern analog and digital communication systems, including transmission and reception. PREREQ: EE 3329 and EE 3345.

**EE 5525 Mechatronics: 3 semester hours.**

Basic kinematics, sensors, actuators, measurements, electronics, microprocessors, programmable logic controllers, feedback control, robotics and intelligent manufacturing. Equivalent to ME 5525. PREREQ: MATH 3360, EE 3342, and EE 3340.

**EE 5526 Computer Architecture and Organization: 3 semester hours.**

Design, implementation, and performance evaluation of modern computer systems; instruction sets; datapath and control optimizations; single-cycle, multiple-cycle, and pipelined processors; hazard detection and resolution; memory hierarchies; peripheral devices. Specific, evaluated graduate-level activities and/or performances are identified in the course syllabus. PREREQ: EE 2274 and EE 2275 or equivalent.

**EE 5527 Embedded Systems Engineering: 2 semester hours.**

Integration of algorithms, software and hardware to design real-time and embedded systems for signal processing and control. PREREQ: CS 4475 or CS 5575. COREQ: EE 5527L.

**EE 5527L Embedded Systems Engineering Laboratory: 1 semester hour.**

Lab activities include the complete process of design and implementation of embedded signal processing and control systems through the integration of algorithms, software, and hardware. COREQ: EE 5527.

**EE 5529 Advanced Electronics: 2 semester hours.**

Introduction to operational amplifiers and their applications, current mirrors, active loads, differential amplifiers, feedback and stability, filters, oscillators, Schmitt triggers, power amplifiers and voltage regulators. COREQ: EE 5529L. PREREQ: EE 3329 and EE 3345.

**EE 5529L Advanced Electronics Laboratory: 1 semester hour.**

Laboratory course emphasizing transistor biasing; amplifiers and other basic analog circuit designs. COREQ: EE 5529.

**EE 5532 Introduction to VLSI Design: 3 semester hours.**

Photolithography, CMOS fabrication, MOSFET operation, CMOS passive elements, design rules and layout, CAD tools for IC design, invertors, static logic and transmission gates, dynamic logic. PREREQ: EE 3329.

**EE 5533 Mixed Signal Design: 3 semester hours.**

Analog IC design. Passive components, parasitic elements, component matching, IC layout techniques, amplifiers, current sources, comparators, op amps, noise, switched capacitor circuits. Includes lab work using design tools. PREREQ: EE 4432 or EE 5532.

**EE 5572 Electrical Machines and Power: 3 semester hours.**

Theory and application of electrical machinery and transformers. Power and energy relationships in power systems. Includes 1 credit lab component. COREQ: EE 5572L. PREREQ: EE 3340, EE 3342, and MATH 3360.

**EE 5572L Electrical Machines and Power Laboratory: 1 semester hour.**

Laboratory course emphasizing an experimental study of the fundamental physical phenomena and characteristics of transformers, induction motors, synchronous and direct current machines. COREQ: EE 5572.

**EE 5573 Automatic Control Systems: 3 semester hours.**

Study of continuous-time and control systems using both frequency-domain and state-space techniques; topics include design methodology, performance specifications, analysis and design techniques. PREREQ: EE 3345, ME 5505 or ME 4405.

**EE 5574 Advanced Circuit Theory: 3 semester hours.**

Methods of analog circuit theory and synthesis. Topics include signal flow graphs, multi-port networks, simulation techniques, and topological methods for formulation of network equations. PREREQ: EE 3340.

**EE 5575 Digital Signal Processing: 3 semester hours.**

Discrete, fast Fourier and Z-transforms, correlation, convolution, finite and infinite impulse response digital filter design, spectral analysis and adaptive digital filters. COREQ: EE 4484 or EE 5584. PREREQ: EE 3345.

**EE 5576 Semiconductor Processing and Fabrication: 3 semester hours.**

Silicon semiconductor processing and basic integrated circuit fabrication. Physics, chemistry, and technology in basic processing steps in production of integrated circuits. PREREQ: PHYS 2211, PHYS 2212, and MATH 1170 or equivalent.

**EE 5578 Semiconductor Devices: 3 semester hours.**

Operating principles of basic building blocks of modern silicon-based semiconductor devices to include p-n junctions, field effect transistors and bipolar junction transistors. PREREQ: PHYS 2212 or equivalent.

**EE 5579 Advanced Semiconductor Devices: 3 semester hours.**

Review of semiconductor band theory. Opto-electronics, quantum mechanics, hetero junctions, power and microwave semiconductor devices. PREREQ: EE 5578 or equivalent.

**EE 5582 Principles of Power Electronics: 3 semester hours.**

Introduction to steady state converter modeling and analysis. Principles of converter dynamics and control including controller design. COREQ: EE 5573. PREREQ: EE 3329.

**EE 5584 Signal Processing Laboratory: 1 semester hour.**

Design finite and infinite response digital filters in digital signal processing system applications. COREQ: EE 5575.

**EE 5592 Digital Control Systems: 3 semester hours.**

Design of advanced control algorithms topics include: observers and state estimation, linear quadratic regulator, frequency-domain techniques for robust control, and an introduction to multivariable and nonlinear control. PREREQ: EE 5573 or EE 4473.
EE 5599 Experimental Course: 1-6 semester hours.
This is an experimental course. The course title and number of credits are noted by course section and announced in the class schedule by the scheduling department. Experimental courses may be offered no more than three times. May be repeated.

EE 6699 Experimental Course: 1-6 semester hours.
This is an experimental course. The course title and number of credits are noted by course section and announced in the class schedule by the scheduling department. Experimental courses may be offered no more than three times. May be repeated.

EE 8850 Doctoral Dissertation: 1-24 semester hours.