

Electrical Engineering Courses

EE 501 - Digital Communications Systems

Hours: 3

Digital communication systems; coding for discrete sources and quantization; source and channel waveforms, signal spaces; modulation and demodulation, random noise; detection, error control coding, efficient decoding algorithms. Prerequisites: Departmental approval.

EE 502 - Cellular Communications Network

Hours: 3

This course will cover fundamental concepts in mobile wireless systems such as propagation and fading, cellular systems, channel assignment, power control, handoff, mobility management. It will also cover system and standards issues including second-generation circuit switched and third-generation packet switched networks, wireless LANs, mobile IP, and ad hoc networks. Besides providing an overview of current technologies, the emphasis on the course will be to identify the challenges that face the engineers of wireless communications networks. Prerequisites: Departmental Approval.

EE 510 - Advanced Wireless Communication

Hours: 3

Wireless applications, modulation formats, wireless channel models and simulation techniques, digital communication over wireless channels, multiple access techniques, wireless standards. Prerequisites: Departmental approval.

EE 512 - Adaptive Signal Processing

Hours: 3

Fundamentals of adaptive filters and associated algorithms: mean-square error and least-squares approaches; steepest-descent algorithm; the least-mean-square adaptive filters, recursive least-squares adaptive filters, frequency domain and sub-band adaptive filters and unsupervised adaptive filters; analysis of these adaptive filters and discussion of selected applications. Prerequisites: Departmental approval.

EE 514 - Digital Image Processing

Hours: 3

Image sampling and quantization, color, point operations, segmentation, morphological image processing, linear image filtering and correlation, image transforms, eigenimages, multiresolution image processing, noise reduction and restoration, feature extraction and recognition tasks, image registration. Emphasis is on the general principles of image processing. Students learn to apply material by implementing and investigating image processing algorithms in Matlab. Prerequisites: Departmental approval.

EE 516 - Antenna Theory and Design

Hours: 3

Application of Maxwell's equations to determine electromagnetic fields of antennas; radiation, directional arrays, impedance characteristics, aperture antennas. Prerequisites: Departmental approval.

EE 518 - Thesis

Hours: 3-6

This course provides graduate students with the structured guidance and academic support necessary to successfully complete a master's thesis. Students will engage in independent research under faculty supervision, developing their research questions, methodology, literature review, and analysis. Prerequisites: Graduate Status. Departmental approval.

EE 520 - RF & Microwave Circuits

Hours: 3

Microwave two-terminal and three-terminal solid-state devices; waveguide and microstrip solid-state circuits; theory and design of microwave mixers, detectors, modulators, switches, phase shifters, oscillators and amplifiers. Prerequisites: Departmental approval.

EE 522 - Information Theory and Coding

Hours: 3

Definition of information; coding of information for transmission over a noisy channel including additive gaussian noise channels and waveform channels; minimum rates at which sources can be encoded; maximum rates at which information can be transmitted over noisy channels. Prerequisites: Departmental approval.

EE 524 - Advanced Control Systems

Hours: 3

Time-domain and frequency-domain design of control systems; concepts of state and state space; description of dynamic systems in state-variable format; canonical forms; controllability and observability; state feedback and state estimation; applications and hardware. Prerequisites: Departmental approval.

EE 526 - Digital Control Systems

Hours: 3

Modeling, analysis, and design of digital control systems; A/D and D/A conversions, Z-transforms, time and frequency domain representations, stability, microprocessor-based designs. Prerequisites: Departmental approval.