

Mack Hawkins
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TECHNICAL ELECTIVES

- ADVANCED ANALOG CIRCUITS & SYSTEMS 4400:693 - Grade: A
Theoretical and practical design background on analog signal processing circuits and systems that are most widely used.
- DIGITAL COMMUNICATION 4400:441 – Grade: B
Introduction to digital communication theory and systems; coding of analog and digital information; digital modulation techniques. Introduction to information theory.
- DIGITAL SIGNAL PROCESSING 4450:540 – Grade: A
Relations between continuous-and discrete-time Fourier expansions. Sampling, aliasing, sampling rate conversion. Operator concepts in signal processing, all-pass systems, FFT, digital filter design
- ELECTRONIC PROPERTIES OF MATERIALS, DEVICES, AND NANOSTRUCTURES 4400:598 – Grade: A
Electronic properties of crystalline solids and nanostructures, including: classical and quantum descriptions of electrical transport and optoelectronic effects. Physical models of solid-state devices.
- EMBEDDED SCIENTIFIC COMPUTING 4450:410 – Grade: A
Organization of scientific and engineering problems for computer solutions. Analysis of error and convergence properties of algorithms.
- EMBEDDED SYSTEMS INTERFACING 4450:422 – Grade: A
Micro-controller structures and embedded peripherals. Interfaces to physical environments. Software access to peripherals, timers, ADCs and DACs. Synchronous and asynchronous communications. Interrupts. Real-time operating systems.
- INFORMATION THEORY 4400:643 – Grade: A-
Source and channel models, entropy, relative entropy, mutual information, data compression, random coding bound and channel coding theorem, channel capacity for Gaussian channels, practical coding schemes, network information theory.
- OPTICAL ELECTRONICS AND PHOTONIC DEVICES 4400:561 – Grade: A
Lightwave engineering, photonic principles and optical electronic device technology.
- POWER ELECTRONICS 4400:483 – Grade: B
Elements of power electronics circuits. Rectifiers, converters, inverters analysis and design.

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STOCHASTIC PROCESSES AND COMMUNICATIONS

4450:567 – Grade: A

Principles and properties of stochastic processes in discrete/continuous-time linear/nonlinear systems, Markov Chains, estimation theory, filtering and prediction, and other specialized topics such as queuing theory. All the topics are introduced with the applications to communications, computer networks, computer architecture, computer science, and control systems

VLSI CIRCUITS AND SYSTEMS

4450:567 – Grade: A

MOSFET structures, design rules, and fabrication. Static, dynamic CMOS. PLAs, ROMs, and RAMs. Layout methodologies and tools. System architecture.

VLSI DESIGN

4450:567 – Grade: B

Digital logic circuits. Very large-scale integration (VLSI) fabrication processes and layout design. Delay and power of digital circuits. Latches and flip-flops in VLSI. Memory design. System-level design issues. Design project.

WIRELESS COMMUNICATIONS

4400:445 – Grade: A

Theory and analysis of wireless communication systems, wireless propagation, multiple access, modulation, demodulation, multipath channel characterization, diversity, cellular, and PCS services and standards.