

COMPUTER ENGINEERING (CPEN)

CPEN:510 Embedded Scientific Computing (3 Credits)

Prerequisite: Permission by Instructor. Organization of scientific and engineering problems for computer solutions. Analysis of error and convergence properties of algorithms. (Formerly 4450:510)

CPEN:515 System Simulation (3 Credits)

Computer simulation of dynamic systems. Discrete system stability, linear multistep and Runge-Kutta methods, nonlinear systems, stiff systems, distributed systems and real-time computing. (Formerly 4450:515)

CPEN:520 Object Oriented Design (3 Credits)

Investigation of object-oriented design paradigm and the design implementation with the object-oriented programming language C++. (Formerly 4450:520)

CPEN:521 Computer Systems Design (3 Credits)

Design of advanced processors at the microarchitecture level. Pipelining. Superscalar, vector and VLIW architectures. Instruction-level parallelism. Compiler support. Multiprocessor architectures. (Formerly 4450:521)

CPEN:522 Embedded Systems Interfacing (3 Credits)

Prerequisite: Permission by instructor. 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. (Formerly 4450:522)

CPEN:523 Programmable Logic (3 Credits)

Electronic circuitry considerations in logic circuits, methods of sequential, threshold logic analysis, synthesis, development of computer arithmetic elements; memory, storage devices, (Formerly 4450:523)

CPEN:527 Computer Networks (3 Credits)

Network architecture and protocol layering. Network design principles, communication protocols, and performance measures. Socket programming, routing, error detection and correction, access control, multimedia networking. (Formerly 4450:527)

CPEN:540 Digital Signal Processing (3 Credits)

Signal sampling and reconstruction; data-converter models. Unilateral and bilateral z transforms. Discrete Fourier Transform (DFT); Fast Fourier Transform (FFT). Digital filter structures and design methods. (Formerly 4450:540)

CPEN:562 Analog Integrated Circuit Design (3 Credits)

CMOS processes and layout; amplifiers, current mirrors, and comparators; current, voltage, and bandgap references; switched capacitor circuits. Frequency and noise analysis techniques. (Formerly 4450:562)

CPEN:567 VLSI Circuits & Systems (3 Credits)

Graduate level introduction to VLSI design. MOSFET structures, design rules, and fabrication. Static, dynamic CMOS. PLAs, ROMs, and RAMs. Layout methodologies and tools. System architecture. (Formerly 4450:567)

CPEN:598 Special Topics: Computer Engineering (1-3 Credits)

(May be taken more than once) Prerequisite: permission of department chair. Special topics in computer engineering. (Formerly 4450:598)

CPEN:606 Computer Architecture (3 Credits)

Historical development of computer architecture. Design methodologies. Processor organization and design of instruction sets. Parallel processing. Control section implementations. Memory organization. System configurations. (Formerly 4450:606)

CPEN:607 Parallel Computer Architecture (3 Credits)

Prerequisite: CPEN 606 or equivalent. This course provides an introduction to parallel computer architectures and parallel processing based on a single instruction, message-passing, or shared memory. (Formerly 4450:607)

CPEN:620 Real-time Scheduling (3 Credits)

Theory of fixed priority scheduling for real-time systems. Aperiodic, Periodic, and Sporadic Task scheduling. (Formerly 4450:620)

CPEN:629 Networked Embedded Systems (3 Credits)

Foundations for design and deployment of asynchronous distributed systems. Wireless sensor-actuator systems. New frontiers in distributed systems including communication, localization, synchronization, failure detection and performance analysis. (Formerly 4450:629)

CPEN:642 Advanced Knowledge Engineering (3 Credits)

Prerequisite: permission of instructor. Advanced study of knowledge acquisition and expert system project management. (Formerly 4450:642)

CPEN:663 VLSI Design & Automation (3 Credits)

Prerequisite: CPEN 567. Methodologies for automated design of VLSI systems. Computer-aided design tools and algorithms. Design for low power, high performance, testability. Research topics in VLSI design. (Formerly 4450:663)

CPEN:693 Special Problems: Computer Engineering (1-3 Credits)

(May be taken more than once) Prerequisite: permission of department chair. For a qualified graduate student. Supervised research or investigation in student's major field. Credit depends upon nature and extent of project. (Formerly 4450:693)

CPEN:794 Advanced Seminar (1-3 Credits)

(May be taken more than once) Prerequisite: permission of department chair. Advanced level coverage of various topics. Intended for student seeking Ph.D. in engineering. (Formerly 4450:794)