

### **#CPE 200 COMPUTER ENGINEERING SOPHOMORE SEMINAR. (1)**

A required course designed for sophomore Computer Engineering Students to inform them about the CPE degree program careers in computer engineering and resources available to students to ensure success. The course will introduce students to the computer engineering program requirements; the academic advising resources and policies; the academic advising staff; the faculty. The course will assist students in setting career objectives; assist in the selection of appropriate electives to meet their career objectives; assist in preparing a plan of study; assist in preparing a professional resume. The course will also introduce students to the areas within computer engineering and learn of the major developments in the field of computer engineering from industrial practitioners. Prereq: EGR 103.

### **CPE 282 DIGITAL LOGIC DESIGN. (4)**

Boolean algebra; number systems; combinational logic circuits; synchronous sequential circuits; asynchronous sequential circuits; design problems using digital logic. Laboratory experiments reinforce the course content. Lecture, three hours; laboratory, one three-hour session. Prereq: EGR 102 or equivalent programming course. (Same as EE 282.)

### **CPE 287 INTRODUCTION TO EMBEDDED SYSTEMS. (4)**

Introduction to Embedded Systems teaches students how to use microcontrollers to interact with the physical world. Lectures will cover the theory behind microcontroller architecture, programming, and interfacing and lab projects will back up that theory with hands-on design experiments using microcontrollers. Topics include assembly language and high-level language programming, address decoding, hardware interrupts, parallel and serial interfacing, analog I/O, and basic real-time processing. Prereq: EE/CPE 282 and prereq or concur: CS 215 or consent of instructor. (Same as EE 287.)

### **\*CPE 380 COMPUTER ORGANIZATION. (3)**

Hardware and software organization of a typical computer; machine language and assembler language programming, interfacing peripheral devices, and input-output programming; real-time computer applications, laboratory included. Prereq: Engineering standing, CS 215 and EE/CPE 282 or EE 280. (Same as CS/EE 380.)

### **CPE 480G ADVANCED COMPUTER ARCHITECTURE. (3)**

This course focuses on advanced computer architectures and low-level system software. Topics include RISC architectures, vector and multiprocessor architectures, multiprocessor memory architectures, and multiprocessor interconnection networks. Peripheral devices such as disk arrays, NICs, and video/audio devices are covered. Topics also include device drivers, interrupt processing, advanced assembly language programming techniques, assemblers, linkers, and loaders. Prereq: CPE/CS/EE 380. (Same as CS 480G and EE 480.)

### **CPE 490 ECE CAPSTONE DESIGN I. (3)**

The first semester of a two-semester design sequence for senior students in electrical engineering with an emphasis on the engineering process. Topics important in product design and manufacturing are included, including considerations of economics, safety, and communication. Students are expected to formally propose a design project that includes a problem definition that incorporates engineering standards and realistic constraints. Students work in teams to develop and complete the designs. Lecture, two hours; laboratory, three hours per week. Prereq: Engineering standing and completion of all other required 400-level EE/CPE courses, excluding EE/CPE 491. (Same as EE 490.)

### **CPE 491 ECE CAPSTONE DESIGN II. (3)**

The second semester of a two-semester design sequence for senior students in electrical engineering with an emphasis on the engineering process. Students work in teams to develop and complete the designs. Topics to include engineering ethics, design, documentation, and communication. Prereq: EE/CPE 490 completed in the previous semester and Engineering standing. (Same as EE 491.)

### **CPE 580 EMBEDDED SYSTEM DESIGN. (3)**

Embedded System Design covers the design and implementation of hardware and software for embedded computer systems. Topics include architectural support for embedded systems, power management, analog and digital I/O, real-time processing design constraints and the design of embedded systems using a real-time operating systems. Prereq: EE/CPE 287, EE/CPE 380, and engineering standing or consent of instructor. (Same as EE 580.)

### **CPE 584 INTRODUCTION OF VLSI DESIGN AND TESTING. (3)**

Introduction to the design and layout of Very Large Scale Integrated (VLSI) Circuits for complex digital systems; fundamentals of the VLSI fabrication process; and introduction to VLSI testing and structured design for testability techniques. Prereq: Engineering standing or consent of instructor. (Same as EE 584.)

**CPE 585 FAULT TOLERANT COMPUTING. (3)**

Students in this course study the theory and practice of fault-tolerant and dependable computing systems. The course will introduce sources of faults, error and failures in computer controlled systems and approaches to design masking and recovery techniques at the hardware, software, and systems level. Prereq: EE/CPE 380 and engineering standing or consent of the instructor. (Same as EE 585.)

**CPE 586 COMMUNICATION AND SWITCHING NETWORKS. (3)**

Fundamentals of modern communication networking and telecommunications, data transmission, multiplexing, circuit switching networks, network topology routing and control, computer communication, packet switching networks, congestion control, frame relay, ATM switching networks, traffic and congestion control. Prereq: EE/CPE 282 and engineering standing. (Same as EE 586.)

**CPE 587 ADVANCED EMBEDDED SYSTEMS. (3)**

An advanced course in the design of embedded systems using state-of-the art microcontroller hardware and software development tools. Topics include architecture support for real-time operating systems, language support for embedded and real-time processing, embedded and wireless networking. Prereq: EE/CPE 580 and engineering standing or consent of instructor. (Same as CS/EE 587.)

**CPE 588 REAL-TIME COMPUTER SYSTEMS. (3)**

This course covers features typically found in real-time and embedded systems. Topics include real-time operating systems, scheduling synchronization, and architectural features of single and multiple processor real-time and embedded systems. Prereq: EE/CPE 580 and engineering standing or consent of instructor. (Same as EE 588.)