COMPUTER ENGINEERING (ENGC)

ENGC 227 Advanced Programming & Data Structures for Engineers 3 Credit Hour(s)
Prerequisite: CSIS 111 and MATH 250
This course covers relevant topics in C++ programming and Data Structures for Computer Engineering students in preparation for embedded systems programming and design. Topics include program design, the introduction of pointers, simple data structures, recursion, internal sort/search methods, data structures such as linked lists, stacks, queues, trees, and graphs, algorithms for manipulating these structures, static and dynamic memory allocation, access methods for sorting/searching, such as hashing and tree searching. This course will not satisfy requirements for the Computer Science Major or Computer Science Minor.
Offered: Resident

ENGC 299 Internship 0 Credit Hour(s)
Professional-supervised experience in first-hand internship opportunities. Application procedures processed through the Career Center. Must apply semester prior to internship.
Registration Restrictions: Sophomore status, 2.00 GPA, two courses in major, declared major, not more than one CSER behind
Offered: Resident

ENGC 301 Introduction to Embedded Systems 3 Credit Hour(s)
Prerequisite: ((CSIS 112 or CSCN 112) and ENGE 201)
Design of microcontroller-based embedded systems; interfacing from both a hardware and software perspective; and applications, including audio, data acquisition, and communication systems.
Offered: Resident

ENGC 361 Computer Architecture 3 Credit Hour(s)
Prerequisite: ENGE 201
Introduction to architecture and organization of computer systems. Topics include data and instruction representation, arithmetic and logical operations, processor and memory implementations, memory hierarchy (cache, main memory and secondary memory), simple pipelines and hardware applications of OS functions.
Offered: Resident

ENGC 371 Embedded and Real-Time Systems Design 3 Credit Hour(s)
Prerequisite: ENGC 301
This course will provide an introduction to the principles of real-time and embedded systems, the main components and design consideration. This course covers Embedded microcomputer systems; implementation of multitasking, synchronization, protection, and paging; operating systems for embedded microcomputers; design, optimization, evaluation, and simulation of digital and analog interfaces; real-time microcomputer software; applications, including data acquisition and control.
Offered: Resident

ENGC 401 Advanced Embedded Systems Design 3 Credit Hour(s)
Prerequisite: ((CSIS 215 or CSCN 215) and ENGC 361 and ENGC 371)
The course provides an in-depth coverage of systematical development and synthesis of advanced embedded systems with emphasis on Field Programmable Gate Array (FPGA) and SoC technologies. The course will cover digital hardware system design, digital arithmetic, SoC design, high level synthesis and functional verification; minimum grade of C.
Offered: Resident

ENGC 415 User Interface Design for Embedded Systems 3 Credit Hour(s)
Prerequisite: (ENGR 110 or ENGR 115) and Computer Engineering Gate Req with a score of 5 and MATH 131 and PHYS 231
This course introduces fundamental design principles relevant to the design of the human interface to embedded systems. The major topics to be discussed include universal design principles, user research methods, the characteristics of tasks supported by embedded systems, user interface design process, and methods for evaluating an interface design.
Offered: Resident

ENGC 465 Introduction to Computer Networks 3 Credit Hour(s)
Prerequisite: ENGE 341
Emphasis is placed on network transport services and key protocols to include TCP, IP, and UDP. Topics include application of network design and implementation of robust performance based computer networks, and an introduction to wireless and mobile networks. (Elective)
Offered: Resident

ENGC 481 Computer Engineering Design I 3 Credit Hour(s)
Prerequisite: (MATH 234 or MATH 334) and CSCN 112 and ENGC 301 and ENGE 201 and ENGE 211 and ENGE 212 and ENGE 311 and ENGE 321 and ENGI 220 and ENGR 210 and ENGR 270 and MATH 131 and MATH 132 and MATH 231 and PHYS 231 and PHYS 232
This is the first senior design course where students are exposed to engineering design and product/process development. Students work in teams on engineering design projects from inception to completion to satisfy the needs and requirements of the clients. In addition to technical design, factors such as safety, economics, and ethical and societal implications are considered.
Note: ENGC 481 and ENGC 482 represent two parts of the same project; therefore, they must be taken in consecutive terms.
Offered: Resident

ENGC 482 Computer Engineering Design II 3 Credit Hour(s)
Prerequisite: ENGC 481
This is the second senior design course where students are exposed to engineering design and development. Design process culminates in prototype manufacturing, testing and validation, design improvement, producing a successful prototype/process/set of design plans and specifications, and presenting to peers, clients, and faculty members.
Note: ENGC 481 and ENGC 482 represent two parts of the same project; therefore, they must be taken in consecutive terms.
Offered: Resident

ENGC 497 Special Topics in Computer Engineering 3 Credit Hour(s)
Selected topics in various areas of Computer Engineering. May be repeated for credit when topic varies.
Offered: Resident

ENGC 499 Computer Engineering Internship 3-6 Credit Hour(s)
Placement in a computer or related organization for a controlled learning experience within the student's career specialization area. Applications are processed through the department Faculty Intern Advisor. Applicants must apply the semester prior to starting the internship.
Offered: Resident