Computer Engineering

Computer engineering involves modeling, design, implementation, testing, evaluation and integration of computer hardware and software to create computing systems. Computer engineers use both hardware concepts from electrical engineering and system software concepts from computer science. Graduates will be well prepared to work in areas such as digital logic design, computer organization/architecture and design, algorithm design and analysis, embedded systems, compilers, and operating systems. Elective options in the curriculum offer preparation in software engineering, databases, dependable systems, networking and communications, VLSI, graphics, image processing, visualization, artificial intelligence, and control systems. The program is offered through a partnership between the Department of Electrical and Computer Engineering and the Department of Computer Science.

Degree Requirements

In addition to fulfilling UK Core and College of Engineering requirements, students must complete the computer engineering curriculum. The following curriculum meets the requirements for the B.S. degree.

Freshman Year

First Semester	Hours
EGR 101 Engineering Exploration I § †	1
EGR 102 Fundamentals of Engineering Computing	2
MA 113 Calculus I	4
CHE 105 General College Chemistry I	4
CIS/WRD 110 Composition and Communication I	3

Second Semester	Hours
EGR 103 Engineering Exploration II § †	2
MA 114 Calculus II	4
PHY 231 General University Physics	4
PHY 241 General University Physics Laboratory	1
CIS/WRD 111 Composition and Communication II	3
CS 215 Introduction to Program Design, Abstraction, and Problem Solving Techniques	4

Sophomore Year

First Semester	Hours
MA 213 Calculus III	4
PHY 232 General University Physics	4
PHY 242 General University Physics Laboratory	1
CS 216 Introduction to Software Engineering Techniques	3
CPE 200 Computer Engineering Sophomore Seminar	1
CPE 282 Digital Logic Design	4

Second Semester	Hours
MA 214 Calculus IV	3
EE 211 Circuits I	4
CPE 287 Introduction to Embedded Systems	4
CS 270 Systems Programming	3
CS 275 Discrete Mathematics	4

Junior Year

First Semester	Hours
EE 223 AC Circuits	4
CS 315 Algorithm Design and Analysis	3
CPE 380 Computer Organization	3
STA 381 Engineering Statistics – A Conceptual Approach	3
UK Core – Humanities	3

Second Semester	Hours
EE 421G Signals and Systems	3
EE 461G Introduction to Electronics	3
Technical Elective††	3
CPE 480 Advanced Computer Architecture	3
UK Core – Social Sciences	3

Senior Year

First Semester	Hours
CPE 490 ECE Capstone Design I*	3
CPE Elective†††	3
CPE Elective†††	3
Technical Elective†	3
UK Core – Citizenship - USA	3

Second Semester	Hours
CPE 491 ECE Capstone Design II †	3
Hardware Elective €	3
Software Elective ~	3
CPE Elective†††	3
UK Core – Global Dynamics	3

§ *Transfer students will take EGR 215, Introduction to the Practice of Engineering for Transfer Students, in place of EGR 101 and EGR 103.*

† *Students must complete both EGR 101 and EGR 103 to fulfill the UK Core Arts and Creativity requirement. Transfer students may satisfy the UK Core Arts and Creativity requirement by taking EGR 215.*

Graduation Composition and Communication Requirement (GCCR) course.

†† *Technical elective may be selected from upper-division engineering, mathematics, statistics, computer science, physics, or other technically-related fields excluding more elementary version of required courses. To be selected in consultation with academic advisor. If a student wishes to use CS 499 instead of CPE 490 and CPE 491 to fulfill the GCCR and senior design requirements, the student must receive approval from the DUS to select an additional technical elective that supports the proposed CS 499 project.*

††† *400-level CS courses and 500-level CPE and EE courses with emphasis in the computer engineering area. To be selected in consultation with academic advisor.*

€ *Hardware electives are senior level courses in the CPE or EE disciplines and shall be selected from the following list and/or selected in consultation with academic advisor:*
EE 582 Hardware Description Languages and Programmable Logic
CPE 584 Introduction of VLSI Design and Testing
CPE 585 Fault Tolerant Computing
CPE 586 Communication and Switching Networks

~ *Software electives are senior level courses in the CPE or CS disciplines and shall be selected from the following list and/or selected in consultation with academic advisor:*
CS 441G Compilers for Algorithmic Languages *(fall only)*
CS 471G Networking and Distributed Operating Systems
CS 570 Modern Operating Systems
CPE 588 Real-Time Computer Systems