# Computer Engineering

College of 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 |
|---|---|
| MA 113 Calculus I | 4 |
| EE 101 Creativity and Design in Electrical and Computer Engineering | |
| **or** | |
| CS 100 The Computer Science Profession | 1-3 |
| CIS/WRD 110 Composition and Communication I | 3 |
| CHE 105 General College Chemistry I | 4 |
| CS 115 Introduction to Computer Programming | 3 |
| UK Core – Humanities | 3 |

| Second Semester | |
|---|---|
| EE 280 Design of Logic Circuits | 3 |
| 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 |
| UK Core – Arts and Creativity | 3 |

### Sophomore Year

| First Semester | Hours |
|---|---|
| CS 215 Introduction to Program Design, Abstraction, and Problem Solving | 4 |
| MA 213 Calculus III | 4 |
| EE 211 Circuits I | 4 |
| PHY 232 General University Physics | 4 |
| PHY 242 General University Physics Laboratory | 1 |
| EE 281 Logical Design Laboratory | 2 |

| Second Semester | |
|---|---|
| MA 214 Calculus IV | 3 |
| CS 275 Discrete Mathematics | 4 |
| CS 216 Introduction to Software Engineering | 3 |
| EE/CS 380 Microcomputer Organization | 3 |
| UK Core – Social Sciences | 3 |

### Junior Year

| First Semester | Hours |
|---|---|
| EE 221 Circuits II | 3 |
| EE 222 Electrical Engineering Laboratory I | 2 |
| CS 315 Algorithm Design and Analysis | 3 |
| EE 383 Introduction to Embedded Systems | 3 |
| UK Core – Citizenship - USA | 3 |
| STA 381 Introduction to Engineering Statistics | 3 |

| Second Semester | |
|---|---|
| EE 461G Introduction to Electronics | 3 |
| CS 470G Introduction to Operating Systems | 3 |
| EE 480/CS 480G Advanced Computer Architecture** | 3 |
| UK Core – Statistical/Inferential Reasoning | 3 |
| EE 421G Signals and Systems | 3 |

### Senior Year

| First Semester | Hours |
|---|---|
| CS 441G Compilers for Algorithmic Languages** | 3 |
| EE/CS Technical Electives†† | 6 |
| Supportive Elective* | 3 |
| Technical Elective† | 3 |

| Second Semester | |
|---|---|
| CS 499 Senior Design Project† | 3 |
| EE/CS Technical Electives†† | 6 |
| Supportive Elective* | 3 |
| UK Core – Global Dynamics | 3 |

**Supportive elective is to be chosen from any University courses, excluding more elementary versions of required courses, such as precalculus mathematics or PHY 211.*

***EE 480/CD 480G is only taught in the spring semester. CS 441G is only taught in the fall semester.*

*†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. EE 490 and EE 491 fulfill the technical elective, senior design and the Graduation Writing Requirement. To be selected in consultation with academic advisor.*

*††EE/CS technical electives are senior level courses in either the computer science or electrical engineering disciplines. These include 400-level CS courses and 500-level CS and EE courses with emphasis in the computer engineering area and excluding EE 595. To be selected in consultation with academic advisor.*

**Recommended EE/CS Technical Electives:**

CS 405G Introduction to Database Systems
CS 415G Combinatorics and Graph Theory
CS 416G Principles of Operations Research I
CS 422 Numerical Solutions of Equations
CS 450G Fundamentals of Programming Languages
CS 463G Introduction to Artificial Intelligence
CS 471G Networking and Distributed Operating Systems
CS 485G Topics in Computer Science (Subtitle required)
EE 512 Digital Communication Systems
EE 560 Semiconductor Device Design
EE 564 Digital Electronic Circuits
EE 572 Digital Control of Dynamic Systems
EE 582 Hardware Description Languages and Programmable Logic
EE 584 Introduction of VLSI Design and Testing
EE 585 Fault Tolerant Computing
EE 586 Communication and Switching Networks
EE 587 Microcomputer Systems Design
EE 599 Topics in Electrical Engineering (Subtitle required)