# COMPUTER ENGINEERING: SEMICONDUCTOR ENGINEERING, BS

The Semiconductor Engineering named option in Computer Engineering prepares students for a career in computer engineering with an emphasis on engineering semiconductor-based devices and systems. This named option provides guidance and recognition for students pursuing this career path. The option uses 20 of the elective credits within the 120-credit Computer Engineering BS degree program to focus on the science, tools, and practices associated with semiconductor engineering. Students selecting this option must submit an option declaration form (https://engineering.wisc.edu/programs/named-options/declaration/) to the dean's office in Engineering Hall.

## REQUIREMENTS

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| Code | Title | Credits |
|---|---|---|
| **Required Courses** | | |
| E C E/PHYSICS 235 | Introduction to Solid State Electronics [1] | 3 |
| E C E 271 | Circuits Laboratory II [2] | 1 |
| E C E 305 | Semiconductor Properties Laboratory [2] | 1 |
| E C E 335 | Microelectronic Devices [1] | 3 |
| E C E 555 | Digital Circuits and Components [3] | 3 |
| E C E 556 | Design Automation of Digital Systems [4] | 3 |
| **Electives** | | |
| Choose two as Advanced or Professional Electives: | | 6-7 |
| E C E 445 | Semiconductor Physics and Devices [1, 5] | |
| E C E 453 | Embedded Microprocessor System Design [6] | |
| E C E 535 | Introduction to Quantum Sensing [1, 5] | |
| E C E 541 | Analog MOS Integrated Circuit Design [1, 3] | |
| E C E 548 | Integrated Circuit Design [1, 3] | |
| E C E 549 | Integrated Circuit Fabrication Laboratory [1, 5] | |
| E C E 553 | Testing and Testable Design of Digital Systems [4] | |
| **Total Credits** | | **20-21** |

1 This course can be taken as a Professional Elective.
2 This course replaces a free elective.
3 This course can be taken as a CMPE Advanced Elective in Electronic Circuits.
4 This course can be taken as a CMPE Elective I.
5 This course can be taken as a CMPE Elective II.
6 This course can be taken as Capstone Design.

## FOUR-YEAR PLAN

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### SAMPLE FOUR-YEAR PLAN

**First Year**

| Fall | Credits | Spring | Credits |
|---|---|---|---|
| MATH 221 | 5 | MATH 222 | 4 |
| E C E/COMP SCI 252 | 3 | PHYSICS 201 | 5 |
| or Communications A | | E C E 210 | 2 |
| CHEM 103, 104, or 109 | 4-5 | Communications A or | 3 |
| Liberal Studies Elective | 3 | E C E/COMP SCI 252 | |
| | **15-16** | | **14** |

**Second Year**

| Fall | Credits | Spring | Credits |
|---|---|---|---|
| E C E 203 | 3 | MATH/COMP SCI 240 | 3 |
| E C E/COMP SCI 352 | 3 | E C E 222 | 4 |
| MATH 234 | 4 | E C E 230 | 4 |
| PHYSICS 202 | 5 | E C E 270 | 1 |
| | | COMP SCI 300 | 3 |
| | **15** | | **15** |

**Third Year**

| Fall | Credits | Spring | Credits |
|---|---|---|---|
| E C E 271 | 1 | E C E/PHYSICS 235 | 3 |
| E C E 353 | 3 | E C E 551 | 3 |
| E C E 340 | 3 | E C E 555 | 3 |
| E C E/COMP SCI 354 | 3 | INTEREGR 397 | 3 |
| COMP SCI 400 | 3 | Liberal Studies Elective | 3 |
| Liberal Studies Elective | 3 | | |
| | **16** | | **15** |

**Fourth Year**

| Fall | Credits | Spring | Credits |
|---|---|---|---|
| E C E 315 | 1 | E C E 453 | 4 |
| E C E 335 | 3 | COMP SCI/E C E 506, 536, 537, or 564 | 3 |
| E C E 305 | 1 | Computer Engineering Elective[1] | 3 |
| E C E 556 | 3 | Professional Elective[1] | 3 |
| Probability and Statistics Elective | 3 | Liberal Studies Elective | 3 |
| Liberal Studies Elective | 3 | | |
| | **14** | | **16** |

**Total Credits 120-121**

1 Computer Engineering Elective II: E C E 445 Semiconductor Physics and Devices, E C E 535 Introduction to Quantum Sensing, E C E 549 Integrated Circuit Fabrication Laboratory, or E C E 553 Testing and Testable Design of Digital Systems
Professional Elective: E C E 541 Analog MOS Integrated Circuit Design, E C E 548 Integrated Circuit Design, E C E 549 Integrated Circuit

Fabrication Laboratory, or E C E 553 Testing and Testable Design of Digital Systems