

ELECTRICAL ENGINEERING: SEMICONDUCTOR ENGINEERING, BS

The Semiconductor Engineering named option in Electrical Engineering prepares students for a career in electrical 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 Electrical 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		
Complete all:		
E C E 305	Semiconductor Properties Laboratory ¹	1
E C E 335	Microelectronic Devices ²	3
E C E 548	Integrated Circuit Design ²	3
E C E 549	Integrated Circuit Fabrication Laboratory ²	4
Complete one:		3
E C E 445	Semiconductor Physics and Devices ³	
E C E 466	Electronics of Solids ³	
Electives		
Complete two courses:		6
E C E 342	Electronic Circuits II ³	
M S & E 351	Materials Science-Structure and Property Relations in Solids (offered in Fall) ³	
E C E 434	Photonics ^{3,4}	
M S & E 434	Introduction to Thin-Film Deposition Processes (offered in Spring) ^{3,5}	
E C E 445	Semiconductor Physics and Devices ^{2,3}	
M S & E 456	Electronic, Optical, and Magnetic Properties of Materials (offered in Fall) ^{3,5}	
E C E 466	Electronics of Solids ^{2,3}	
E C E 535	Introduction to Quantum Sensing ³	
E C E 536	Integrated Optics and Optoelectronics ^{4,5}	

E C E 541	Analog MOS Integrated Circuit Design ^{2,3}
E C E 542	Introduction to Microelectromechanical Systems ^{2,3}
PHYSICS 551	Solid State Physics ³
M S & E 553	Nanomaterials & Nanotechnology (offered in Spring) ^{3,5}
E C E 555	Digital Circuits and Components ^{2,3}

Total Credits **20**

- ¹ This course can be taken as an Advanced Elective - Laboratory.
² This course can be taken as an Advanced Elective in Circuits & Devices.
³ This course can be taken as a Professional Elective.
⁴ This course can be taken as an Advanced Elective in Fields and Waves.
⁵ This course has additional requisites not required for the BS in Electrical Engineering.

FOUR-YEAR PLAN

FOUR-YEAR PLAN SAMPLE FOUR-YEAR PLAN

First Year

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

Second Year

Fall	Credits Spring	Credits
PHYSICS 202	5 E C E 222	4
MATH 234	4 COMP SCI 300	3
E C E 203	3 E C E 230	4
Liberal Studies Elective	3 E C E 270	1
	Free Elective	1
15		13

Third Year

Fall	Credits Spring	Credits
E C E/PHYSICS 235	3 ECE Advanced Elective	3
Statistics/Probability Elective	3 INTEREGR 397	3
E C E 340	3 E C E 305	1
E C E 271	1 E C E 335	3
E C E 330	3 Liberal Studies Elective	3
E C E/COMP SCI 352	3 Professional Elective (Adv Math)	3
16		16

Fourth Year

Fall	Credits Spring	Credits
Liberal Studies Elective	3 Professional Elective ¹	3
E C E 548	3 E C E 466 or 445	3

E C E 549	4 ECE Advanced Elective (4XX) ¹	3
EE Advanced Lab (3XX)	1 ECE Capstone Design	3
E C E 370	2 Liberal Studies Elective	3
Professional Elective ¹	3	
	16	15

Total Credits 120-121

¹ Replace at least two of these professional electives or advanced electives with courses from the Semiconductors electives list. Elective courses may have additional requisites.