

Bachelor of Science

Physics with a Major in Physics and Electrical Engineering (BS, BSEE)

Degree Program Guide

The Degree Program Guide is a suggested curriculum to complete this degree program in four years. It is just one of several plans that will work and is presented only as broad guidance to students. Each student is strongly encouraged to develop a customized plan in consultation with their academic advisor. Additional information can also be found in Degree Works.

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 110	Explore Engineering and Technology ¹	2
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
MATH 211	Calculus I	4
ENGL 110C	English Composition (Grade of C or better required)	3
COMM 101R	Public Speaking	3
Credit Hours		16
Spring		
PHYS 261N or PHYS 231N or PHYS 226N	Advanced University Physics I or University Physics I or Honors: University Physics I	4
ECE 111	Information Literacy and Research for Electrical and Computer Engineering ²	2
CHEM 123N	Foundations of Chemistry II Lecture	3
CHEM 124N	Foundations of Chemistry II Laboratory	1
MATH 212	Calculus II	4
Credit Hours		14
Sophomore		
Fall		
PHYS 262N or PHYS 232N or PHYS 227N	Advanced University Physics II or University Physics II or Honors: University Physics II	4
ECE 201	Circuit Analysis I	3
ENGN 150	Computer Programming for Engineering Problem Solving	4
MATH 307 or MATH 280	Ordinary Differential Equations or Transfer Credit for Ordinary Differential Equations	3
ENGL 231C or ENGL 211C	Writing, Rhetoric, and Research: Special Topics or Writing, Rhetoric, and Research	3
Credit Hours		17

Spring		
PHYS 319	Analytical Mechanics	3
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory ³	2
ECE 241	Fundamentals of Computer Engineering	4
MATH 312 or MATH 285	Calculus III or Transfer Credit for Calculus III	4
Credit Hours		16

Junior		
Fall		
PHYS 323	Modern Physics	3
PHYS 355	Mathematical Methods of Physics	3
PHYS 425	Electromagnetism I ⁴	3
ECE 302	Linear System Analysis	3
ECE 303	Introduction to Electrical Power	3
Credit Hours		15

Spring		
ECE 313	Electronic Circuits	4
ECE 381	Introduction to Discrete-time Signal Processing	3
ECE 323 or PHYS 453	Electromagnetics ⁵ or Electromagnetism II	3
PHYS 411 or PHYS 415 or PHYS 416 or PHYS 417		3
Literature Way of Knowing		3
Credit Hours		16

Senior		
Fall		
PHYS 452	Introduction to Quantum Mechanics	3
ECE 304	Probability, Statistics, and Reliability	3
ECE 332	Microelectronic Materials and Processes	3
ECE Technical Elective I ⁶		3
ENMA 480	Ethics and Philosophy in Engineering Applications ⁷	3
Credit Hours		15

Spring		
PHYS 413	Methods of Experimental Physics	3
PHYS 456	Intermediate Quantum Mechanics ⁵	3
PHYS 499W or PHYS 489W and PHYS 490W		3
ECE 387	Microelectronics Fabrication Laboratory	3
Human Behavior Way of Knowing		3
Credit Hours		15

Fifth Year		
Fall		
PHYS 420	Introductory Computational Physics	3

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ECE 485W	Electrical Engineering Design I (C or better required)	3
ECE 486	Preparatory ECE Senior Design II	2
ECE Technical Elective II		3
Human Creativity Way of Knowing		3
Credit Hours		14
Spring		
PHYS 454	Thermal and Statistical Physics	3
ECE 487	ECE Senior Design II	2
ECE Technical elective III		3
ECE Technical elective IV		3
Interpreting the Past Way of Knowing		3
Credit Hours		14
Total Credit Hours		152

- * Does not include the University's General Education language and culture requirement. Additional hours may be required.
- 1 ENGN 110 satisfies the Physics Approved Seminar requirement in the Physics curriculum.
- 2 ECE 111 satisfies the PHYS Information Literacy & Research requirement in the Physics curriculum.
- 3 ECE 287 satisfies the PHYS 303 requirement in the Physics curriculum.
- 4 PHYS 425 satisfies the Nonmajor Engineering Elective requirement in the Electrical Engineering curriculum.
- 5 PHYS 453 and PHYS 456 offered spring semester only.
- 6 Electrical Engineering students need four technical elective courses selected from one of two options: (1) four 400-level ECE technical elective courses; (2) three 400-level ECE technical elective courses and one 300-level ECE technical elective course or one approved 300- or 400-level CS/MATH/Engineering course.
- 7 ENMA 480 satisfies the PHYS Philosophy & Ethics requirement in the Physics curriculum.

The General Education requirements in information literacy and research, impact of technology, and philosophy and ethics are met through the Electrical Engineering major/degree. The upper-division General Education requirement is met through the completion of a second major/degree.

Electrical engineering majors must earn a grade of C or better in all 200-level ECE courses prior to taking the next course in the sequence.

Any ECE course registration issues are to be resolved with the ECE Academic Coordinator and Program Manager.