Bachelor of Science in Electrical Engineering

Electrical Engineering (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.

Electrical Engineering (BSEE)*

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 121	Introduction to Engineering and Technology	4
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
MATH 211	Calculus I (Grade of C or better required)	4
ENGL 110C	English Composition (Grade of C or better required)	3
	Credit Hours	**15**
Spring		
ENGN 122 or ENGN 123	MATLAB and C++ Programming for Engineers or C++ Programming for Engineers	4
COMM 101R	Public Speaking	3
MATH 212	Calculus II (Grade of C or better required)	4
PHYS 231N	University Physics I	4
	Credit Hours	**15**
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations or Transfer Credit for Ordinary Differential Equations	3
ECE 201	Circuit Analysis I	3
ECE 241	Fundamentals of Computer Engineering	4
PHYS 232N	University Physics II	4
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (Grade of C or better required) or Writing, Rhetoric, and Research: Special Topics	3
	Credit Hours	**17**
Spring		
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory	2
ECE 304	Probability, Statistics, and Reliability	3
MATH 312 or MATH 285	Calculus III or Transfer Credit for Calculus III	4
Interpreting the Past Way of Knowing		3
	Credit Hours	**15**
Junior		
Fall		
ECE 302	Linear System Analysis	3
ECE 313	Electronic Circuits	4
ECE 332	Microelectronic Materials and Processes	3
ECE 461	Automatic Control Systems	3
Human Creativity Way of Knowing		3
	Credit Hours	**16**
Spring		
ECE 303	Introduction to Electrical Power	3
ECE 323	Electromagnetics	3
ECE 381	Introduction to Discrete-time Signal Processing	3
ECE 451	Communication Systems	3
Literature Way of Knowing		3
	Credit Hours	**15**
Senior		
Fall		
ECE 481W	Preparatory ECE Senior Design (Grade of C or better required)	3
Technical Elective **		3
Technical Elective **		3
ENMA 480	Ethics and Philosophy in Engineering Applications	3
Upper-Division General Education course		3
	Credit Hours	**15**
Spring		
ECE 482	ECE Senior Design	3
Technical Elective **		3
Technical Elective **		3
Human Behavior Way of Knowing		3
Upper-Division General Education course		3
	Credit Hours	**15**
	Total Credit Hours	**123**

* Does not include the University's General Education language and culture requirement. Additional hours may be required.

** 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.

Electrical Engineering (BSEE) Dual Major/Degree with Computer Engineering Major (BSCE)*

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 121	Introduction to Engineering and Technology	4
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory ** or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I (Grade of C or better required)	4
ENGL 110C	English Composition (Grade of C or better required)	3
	Credit Hours	**15**
Spring		
ENGN 122 or ENGN 123	MATLAB and C++ Programming for Engineers or C++ Programming for Engineers	4
MATH 212	Calculus II (Grade of C or better required)	4
COMM 101R	Public Speaking	3
PHYS 231N	University Physics I	4
	Credit Hours	**15**
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations or Transfer Credit for Ordinary Differential Equations	3
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (Grade of C or better required) or Writing, Rhetoric, and Research: Special Topics	3
ECE 201	Circuit Analysis I	3
PHYS 232N	University Physics II	4
CS 381	Introduction to Discrete Structures	3
Human Creativity Way of Knowing		3
	Credit Hours	**19**
Spring		
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory	2
ECE 241	Fundamentals of Computer Engineering	4
CS 252	Introduction to Unix for Programmers	1
ECE 250	Object-Oriented Programming in C++ for Engineers	3
MATH 312 or MATH 285	Calculus III or Transfer Credit for Calculus III	4
	Credit Hours	**17**
Junior		
Fall		
ECE 302	Linear System Analysis	3
ECE 304	Probability, Statistics, and Reliability	3
ECE 461	Automatic Control Systems	3
ECE 341	Digital System Design	3
CS 261	Java for Programmers	1
Interpreting the Past Way of Knowing		3
	Credit Hours	**16**
Spring		
ECE 303	Introduction to Electrical Power	3
ECE 313	Electronic Circuits	4
ECE 346	Microcontrollers	3
ECE 381	Introduction to Discrete-time Signal Processing	3
CS 361	Data Structures and Algorithms	3
ECE 451	Communication Systems	3
	Credit Hours	**19**
Senior		
Fall		
ECE 342	Field Programmable Gate Arrays Design Laboratory	2
ECE 323	Electromagnetics	3
ECE 481W	Preparatory ECE Senior Design (Grade of C or better required)	3
ECE 443	Computer Architecture	3
ECE 332	Microelectronic Materials and Processes	3
ECE 355	Introduction to Networks and Data Communications	3
	Credit Hours	**17**
Spring		
ECE 482	ECE Senior Design	3
CS 350 or CS 330	Introduction to Software Engineering or Object-Oriented Design and Programming	3
CS 471	Operating Systems	3
ENMA 480	Ethics and Philosophy in Engineering Applications	3
Human Behavior Way of Knowing		3
Literature Way of Knowing		3
	Credit Hours	**18**
	Total Credit Hours	**136**

* Does not include the University's General Education language and culture requirement. Additional hours may be required.

** CHEM 120 is for online program students only.

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

Electrical & Computer engineering majors must earn a grade of C or better in all 200-level ECE courses and all CS 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. Students must have a 3.00 GPA or better and must obtain approval from their advisor and college dean to register for more than 18 hours in a semester.

The five-year plan is a suggested curriculum to complete this degree program in five 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.

Students seeking two degrees must complete a minimum of 150 credit hours.

Electrical Engineering (BSEE) Dual Major/Degree with Modeling & Simulation Engineering Major (BSCE)*

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 121	Introduction to Engineering and Technology	4
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N or CHEM 120	Foundations of Chemistry I Laboratory [**] or Foundations of Chemistry I Laboratory for Online Degree Programs	1
MATH 211	Calculus I (Grade of C or better required)	4
ENGL 110C	English Composition (Grade of C or better required)	3
	Credit Hours	**15**
Spring		
MATH 212	Calculus II (Grade of C or better required)	4
ENGN 122 or ENGN 123	MATLAB and C++ Programming for Engineers or C++ Programming for Engineers	4
PHYS 231N	University Physics I	4
COMM 101R	Public Speaking	3
	Credit Hours	**15**
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations or Transfer Credit for Ordinary Differential Equations	3
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (Grade of C or better required) or Writing, Rhetoric, and Research: Special Topics	3
ECE 201	Circuit Analysis I	3
PHYS 232N	University Physics II	4
CS 381	Introduction to Discrete Structures	3
Human Creativity Way of Knowing		3
	Credit Hours	**19**
Spring		
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory	2
ECE 241	Fundamentals of Computer Engineering	4
ECE 250	Object-Oriented Programming in C++ for Engineers	3
MATH 312 or MATH 285	Calculus III or Transfer Credit for Calculus III	4
	Credit Hours	**16**
Junior		
Fall		
ECE 302	Linear System Analysis	3
ECE 304	Probability, Statistics, and Reliability	3
ECE 341	Digital System Design	3
ECE 461	Automatic Control Systems	3
CS 261	Java for Programmers	1
Interpreting the Past Way of Knowing		3
	Credit Hours	**16**
Spring		
ECE 313	Electronic Circuits	4
ECE 346	Microcontrollers	3
ECE 451	Communication Systems	3
ECE 381	Introduction to Discrete-time Signal Processing	3
ECE 306	Discrete System Modeling and Simulation	3
ECE 320	Continuous System Modeling and Simulation	3
	Credit Hours	**19**
Senior		
Fall		
ECE 323	Electromagnetics	3
ECE 481W	Preparatory ECE Senior Design (Grade of C or better required)	3
ECE 303	Introduction to Electrical Power	3
ECE 406	Computer Graphics and Visualization	3
ECE 348	Simulation Software Design	3
ECE 332	Microelectronic Materials and Processes	3
	Credit Hours	**18**
Spring		
ECE 482	ECE Senior Design	3
ENMA 480	Ethics and Philosophy in Engineering Applications	3
ENMA 410	Agile Project Management	3
Technical Elective [***]		3
Literature Way of Knowing		3

Human Behavior Way of Knowing		3
	Credit Hours	**18**
	Total Credit Hours	**136**

* Does not include the University's General Education language and culture requirement. Additional hours may be required.

** CHEM 120 is for online program students only.

*** Electrical & Computer Engineering students pursuing the double major/degree need their final technical elective to be a 400-level ECE technical elective course.

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

Electrical & Computer engineering majors must earn a grade of C or better in all 200-level ECE courses and all CS 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. Students must have a 3.00 GPA or better and must obtain approval from their advisor and college dean to register for more than 18 hours in a semester.

The four-year plan 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.

Students seeking two degrees must complete a minimum of 150 credit hours.

Bachelor of Science in Physics (BS): Dual Degree with Electrical Engineering (BSEE)*

Course	Title	Credit Hours
Freshman		
Fall		
ENGN 121	Introduction to Engineering and Technology [1]	4
CHEM 121N	Foundations of Chemistry I Lecture	3
CHEM 122N	Foundations of Chemistry I Laboratory	1
MATH 211	Calculus I (Grade of C or better required)	4
ENGL 110C	English Composition (Grade of C or better required)	3
	Credit Hours	**15**
Spring		
ENGN 122 or ENGN 123	MATLAB and C++ Programming for Engineers or C++ Programming for Engineers	4
MATH 212	Calculus II (Grade of C or better required)	4
PHYS 261N or PHYS 231N or PHYS 226N	Advanced University Physics I or University Physics I or Honors: University Physics I	4
COMM 101R	Public Speaking	3
	Credit Hours	**15**
Sophomore		
Fall		
MATH 307 or MATH 280	Ordinary Differential Equations or Transfer Credit for Ordinary Differential Equations	3
CHEM 123N	Foundations of Chemistry II Lecture	3
CHEM 124N	Foundations of Chemistry II Laboratory	1
ECE 201	Circuit Analysis I	3
ENGL 211C or ENGL 231C	Writing, Rhetoric, and Research (Grade of C or better required) or Writing, Rhetoric, and Research: Special Topics	3
PHYS 262N or PHYS 232N or PHYS 227N	Advanced University Physics II or University Physics II or Honors: University Physics II	4
	Credit Hours	**17**
Spring		
ECE 202	Circuit Analysis II	3
ECE 287	Fundamental Electric Circuit Laboratory [2]	2
ECE 241	Fundamentals of Computer Engineering	4
PHYS 319	Analytical Mechanics	3
MATH 312 or MATH 285	Calculus III or Transfer Credit for Calculus III	4
	Credit Hours	**16**
Junior		
Fall		
ECE 302	Linear System Analysis	3
ECE 303	Introduction to Electrical Power	3
PHYS 323	Modern Physics	3
PHYS 355	Mathematical Methods of Physics	3
PHYS 425	Electromagnetism I [3]	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 [4] 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		
ECE 304	Probability, Statistics, and Reliability	3
ECE 461	Automatic Control Systems	3
ECE Technical Elective I [5]		3
PHYS 452	Introduction to Quantum Mechanics	3

ENMA 480	Ethics and Philosophy in Engineering Applications [6]	3
	Credit Hours	**15**
Spring		
ECE 451	Communication Systems	3
PHYS 413	Methods of Experimental Physics	3
PHYS 456	Intermediate Quantum Mechanics [4]	3
PHYS 499W or PHYS 489W and PHYS 490W		3
Human Behavior Way of Knowing		3
	Credit Hours	**15**
Fifth Year		
Fall		
ECE 332	Microelectronic Materials and Processes	3
ECE 481W	Preparatory ECE Senior Design (Grade of C or better required to meet the University Writing Intensive requirement)	3
ECE Technical Elective II [5]		3
PHYS 420	Introductory Computational Physics	3
Human Creativity Way of Knowing		3
	Credit Hours	**15**
Spring		
ECE 482	ECE Senior Design	3
ECE Technical elective III [5]		3
ECE Technical elective IV [5]		3
PHYS 454	Thermal and Statistical Physics	3
Interpreting the Past Way of Knowing		3
	Credit Hours	**15**
	Total Credit Hours	**154**

* Does not include the University's General Education language and culture requirement. Additional hours may be required.

1 ENGN 121 satisfies both the Physics Approved Seminar requirement and the PHYS Information Literacy and Research requirement in the Physics curriculum.

2 ECE 287 satisfies the PHYS 303 requirement in the Physics curriculum.

3 PHYS 425 satisfies the Nonmajor Engineering Elective requirement in the Electrical Engineering curriculum.

4 PHYS 453 and PHYS 456 offered spring semester only.

5 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.

6 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.

The five-year plan is a suggested curriculum to complete this degree program in five 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.