ELECTRICAL ENGINEERING (B.S.E.E.)

Required coursework includes the university requirements (see regulation J-3 (https://catalog.uidaho.edu/general-requirements-academic-procedures/j-general-requirements-baccalaureate-degrees/)) and:

Code	Title	Hours
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1
CS 120	Computer Science I	4
ECE 101	Foundations of Electrical and Computer Engineering	2
ECE 210	Electrical Circuits I	3
ECE 211	Electrical Circuits Lab I	1
ECE 212	Electrical Circuits II	3
ECE 213	Electrical Circuits II Lab	1
ECE 240	Digital Logic	3
ECE 241	Logic Circuit Lab	1
ECE 292	Sophomore Seminar	0
ECE 310	Microelectronics I	3
ECE 311	Microelectronics I Lab	1
ECE 320	Energy Systems I	3
ECE 321	Energy Systems I Laboratory	1
ECE 330	Electromagnetic Theory	3
ECE 331	Electromagnetics Laboratory	1
ECE 340	Microcontrollers	3
ECE 341	Microcontrollers Lab	1
ECE 350	Signals and Systems I	3
ECE 351	Signals and Systems I Lab	1
ECE 480	EE Senior Design I	3
ECE 481	EE Senior Design II	3
ECE 491	Senior Seminar	0
ENGR 210	Engineering Statics	3
ENGR 220	Engineering Dynamics	3
ENGR 360	Engineering Economy	2
ENGL 317	Technical Writing II	3
MATH 170	Calculus I	4
MATH 175	Calculus II	4
MATH 275	Calculus III	3
MATH 310	Ordinary Differential Equations	3
MATH 330	Linear Algebra	3
PHIL 103	Introduction to Ethics	3
or AMST 301	Studies in American Culture	
PHYS 211	Engineering Physics I	3
PHYS 211L	Laboratory Physics I	1
PHYS 212	Engineering Physics II	3
PHYS 212L	Laboratory Physics II	1
STAT 301	Probability and Statistics	3
Select one of the following:		3-4
ECON 201	Principles of Macroeconomics	
ECON 202	Principles of Microeconomics	
ECON 272	Foundations of Economic Analysis	
Select one upper-division Engineering Science elective:		3
ENGR 320	Engineering Thermodynamics and Heat Transfer	
ENGR 335	Engineering Fluid Mechanics	
ENGR 350	Engineering Mechanics of Materials	
ENGR 428	Numerical Methods	
MATH 428	Numerical Methods	
PHYS 428	Numerical Methods	
Select 18 credits of Technical electives taken from upper-division Engineering, Math, Physics, Statistics, and Computer Science courses: [1]		18
ECE 410	Microelectronics II	
or ECE 418	Introduction to Electronic Packaging	
ECE 420	Energy Systems II	
ECE 430	Microwave and Millimeter Wave Circuits	
or ECE 432	Propagation of Wireless Signals	
or ECE 434	Antenna Principles and Design	
ECE 440	Digital Systems Engineering	
or ECE 443	Distributed Processing and Control Networks	
ECE 450	Signals and Systems II	
ECE 460	Semiconductor Devices	
or ECE 465	Introduction to Microelectronics Fabrication	
Total Hours		**114-115**

[1]

Students may request, after approval by their academic advisor and the Petition Committee, to use other upper division technical courses in the College of Science or in Engineering Management (EM) in partial fulfillment of this requirement. Of these eighteen credits a minimum of twelve credits must be selected from electrical engineering courses including at least nine credits from these courses.

Courses to total 128 credits for this degree, not counting ENGL 101 , MATH 143 , and other courses that might be required to remove deficiencies.

Students majoring in electrical engineering must earn a grade of P in ECE 292 and a grade of C or better in each of the following courses for graduation and before registration is permitted in upper-division electrical and computer engineering courses:

Code	Title	Hours
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1
CS 120	Computer Science I	4
ECE 210	Electrical Circuits I	3
ECE 211	Electrical Circuits Lab I	1
ECE 212	Electrical Circuits II	3
ECE 213	Electrical Circuits II Lab	1
ECE 240 & ECE 241	Digital Logic and Logic Circuit Lab	4
ENGR 210	Engineering Statics	3
ENGR 220	Engineering Dynamics	3
MATH 170	Calculus I	4
MATH 175	Calculus II	4
MATH 275	Calculus III	3

MATH 310	Ordinary Differential Equations	3
PHYS 211	Engineering Physics I	3
PHYS 211L	Laboratory Physics I	1
PHYS 212	Engineering Physics II	3
PHYS 212L	Laboratory Physics II	1

Students majoring in electrical engineering or computer engineering must meet the college requirements for admission to classes (see "Admission to Classes (https://catalog.uidaho.edu/colleges-related-units/engineering/)" under College of Engineering (https://catalog.uidaho.edu/colleges-related-units/engineering/), part four).

Any student majoring in electrical engineering may accumulate no more than five (5) letter grades of D's and F's in mathematics, science, or engineering courses that are used to satisfy graduation requirements. Included in this number are multiple repeats of a single class or single repeats in multiple classes and courses transferred from other institutions. Specifically excluded are D or F grades from laboratory sections associated with courses.

Within the constraints on choice of technical electives noted above, students may choose sets of electives to develop proficiencies in certain areas of emphasis. Three such areas are currently available: one in communications, one in integrated circuit design, and one in power. The course requirements for each of these areas are described below.

Communications Emphasis

This emphasis prepares students for a variety of careers in the communications industry. Students should take a total of 18 credits from the following:

Code	Title	Hours
Core Courses		
Select 9 credits from the following:		9
ECE 410	Microelectronics II	
ECE 430	Microwave and Millimeter Wave Circuits	
ECE 450	Signals and Systems II	
Technical Electives		**9**
Select 9 credits from the following:		9
ECE 413	Radio-Frequency IC Design	
ECE 432	Propagation of Wireless Signals	
ECE 445	Introduction to VLSI Design	
ECE 452	Communication Systems	
ECE 455	Information and Coding Theory	
Total Hours		**27**

Microelectronics Emphasis

This emphasis prepares students for a variety of careers in the semiconductor industry. It includes courses in analog/RF and mixed-signal integrated circuit (IC) design, semiconductors, and IC packaging. Students should take a total of 18 credits from the following:

Code	Title	Hours
Required credits:		
ECE 410	Microelectronics II	3
ECE 460	Semiconductor Devices	3
Select 3 core credits from the following:		3
ECE 413	Radio-Frequency IC Design	
ECE 415	Analog Integrated Circuit Design	
ECE 418	Introduction to Electronic Packaging	
Select 3 credits from the following:		3
ECE 440	Digital Systems Engineering	
ECE 430	Microwave and Millimeter Wave Circuits	
ECE 450	Signals and Systems II	
ECE 465	Introduction to Microelectronics Fabrication	
Select 6 additional credits of technical electives from the following:		6
ECE 413	Radio-Frequency IC Design	
ECE 415	Analog Integrated Circuit Design	
ECE 417	Mixed Signal IC Design	
ECE 418	Introduction to Electronic Packaging	
ECE 419	Image Sensors and Systems	
ECE 445	Introduction to VLSI Design	
ECE 462	Quantum Mechanics for Electrical Engineers	
ECE 465	Introduction to Microelectronics Fabrication	
Total Hours		**18**

Power Emphasis

This emphasis prepares students for a variety of careers with electric utilities, consulting firms, and manufacturing and design firms. Students should take a total of 18 credits from the following:

Code	Title	Hours
ECE 420	Energy Systems II	3
ECE 422	Power Systems Analysis	3
ECE 427	Power Electronics	3
ECE 450	Signals and Systems II	3
Select 3 credits from the following:		3
ECE 410	Microelectronics II	
ECE 430	Microwave and Millimeter Wave Circuits	
ECE 440	Digital Systems Engineering	
Select 3 additional credits of technical electives:		3
Total Hours		**18**

Four-Year Plan

Fall Term 1		**Hours**
CS 120	Computer Science I	4
ENGL 101	Writing and Rhetoric I	3
MATH 170	Calculus I	4
Humanistic and Artistic Ways of Knowing Course		3
Oral Communication Course		3
	Hours	**17**
Spring Term 1		
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Laboratory	1
ECE 101	Foundations of Electrical and Computer Engineering	2
MATH 175	Calculus II	4
PHYS 211	Engineering Physics I	3
PHYS 211L	Laboratory Physics I	1
ENGL 102	Writing and Rhetoric II	3
	Hours	**17**
Fall Term 2		
ECE 210	Electrical Circuits I	3
ECE 211	Electrical Circuits Lab I	1

ENGR 210	Engineering Statics	3
MATH 310	Ordinary Differential Equations	3
PHYS 212	Engineering Physics II	3
PHYS 212L	Laboratory Physics II	1
AMST 301 OR PHIL 103		3
	Hours	**17**
Spring Term 2		
ECE 212	Electrical Circuits II	3
ECE 213	Electrical Circuits II Lab	1
ECE 240	Digital Logic	3
ECE 241	Logic Circuit Lab	1
ECE 292	Sophomore Seminar	0
ENGR 220	Engineering Dynamics	3
MATH 275	Calculus III	3
ECON 201 OR ECON 202 OR ECON 272		3
	Hours	**17**
Fall Term 3		
ECE 310	Microelectronics I	3
ECE 311	Microelectronics I Lab	1
ECE 320	Energy Systems I	3
ECE 321	Energy Systems I Laboratory	1
ECE 330	Electromagnetic Theory	3
ECE 331	Electromagnetics Laboratory	1
ENGR 360	Engineering Economy	2
American Diversity Course		3
	Hours	**17**
Spring Term 3		
ECE 340	Microcontrollers	3
ECE 341	Microcontrollers Lab	1
ECE 350	Signals and Systems I	3
ECE 351	Signals and Systems I Lab	1
MATH 330	Linear Algebra	3
STAT 301	Probability and Statistics	3
ENGR 320 OR ENGR 335 OR ENGR 350 OR ENGR 428 OR MATH 428 OR PHYS 428		3
	Hours	**17**
Fall Term 4		
ECE 480	EE Senior Design I	3
ECE 491	Senior Seminar	0
ENGL 317	Technical Writing II	3
UPDV Technical, Major Elective Course		3
International Course		3
Social and Behavioral Ways of Knowing Course		3
ECE 410 OR ECE 418 OR ECE 420 OR ECE 430 OR ECE 432 OR ECE 434 OR ECE 440 OR ECE 443 OR ECE 450 OR ECE 460 OR ECE 465		3
	Hours	**18**
Spring Term 4		
ECE 481	EE Senior Design II	3
UPDV Technical, Major Elective Course		3
UPDV Technical, Major Elective Course		3
ECE 410 OR ECE 418 OR ECE 420 OR ECE 430 OR ECE 432 OR ECE 434 OR ECE 440 OR ECE 443 OR ECE 450 OR ECE 460 OR ECE 465		3
ECE 410 OR ECE 418 OR ECE 420 OR ECE 430 OR ECE 432 OR ECE 434 OR ECE 440 OR ECE 443 OR ECE 450 OR ECE 460 OR ECE 465		3
	Hours	**15**
	Total Hours	**135**

Five-Year Plan

Fall Term 1		**Hours**
ENGL 101	Writing and Rhetoric I	3
MATH 143	College Algebra	3
MATH 144	Analytic Trigonometry	1
CS 112	Computational Thinking and Problem Solving	3
Humanistic and Artistic Ways of Knowing Course		3
	Hours	**13**
Spring Term 1		
CS 120	Computer Science I	4
ECE 101	Foundations of Electrical and Computer Engineering	2
ENGL 102	Writing and Rhetoric II	3
MATH 170	Calculus I	4
	Hours	**13**
Fall Term 2		
CHEM 111L	General Chemistry I Laboratory	1
CHEM 111	General Chemistry I	3
MATH 175	Calculus II	4
MATH 330	Linear Algebra	3
PHYS 211	Engineering Physics I	3
PHYS 211L	Laboratory Physics I	1
	Hours	**15**
Spring Term 2		
ECE 210	Electrical Circuits I	3
ECE 211	Electrical Circuits Lab I	1
ECE 292	Sophomore Seminar	0
ENGR 210	Engineering Statics	3
MATH 310	Ordinary Differential Equations	3
PHYS 212	Engineering Physics II	3
PHYS 212L	Laboratory Physics II	1
	Hours	**14**
Fall Term 3		
ECE 212	Electrical Circuits II	3
ECE 213	Electrical Circuits II Lab	1
ECE 240	Digital Logic	3
ECE 241	Logic Circuit Lab	1
ENGR 220	Engineering Dynamics	3
MATH 275	Calculus III	3
	Hours	**14**
Spring Term 3		
ECE 310	Microelectronics I	3
ECE 311	Microelectronics I Lab	1
STAT 301	Probability and Statistics	3
Oral Communication Course		2
Social and Behavioral Ways of Knowing Course		3
ECON 201 OR ECON 202 OR ECON 272		3
	Hours	**15**
Fall Term 4		
ECE 320	Energy Systems I	3
ECE 321	Energy Systems I Laboratory	1
ECE 330	Electromagnetic Theory	3
ECE 331	Electromagnetics Laboratory	1
ENGR 360	Engineering Economy	2
AMST 301 OR PHIL 103		3
	Hours	**13**
Spring Term 4		
ECE 340	Microcontrollers	3
ECE 341	Microcontrollers Lab	1
ECE 350	Signals and Systems I	3
ECE 351	Signals and Systems I Lab	1
UPDV Technical, Major Elective Course		3
ENGR 320 OR ENGR 335 OR ENGR 350 OR ENGR 428 OR MATH 428 OR PHYS 428		3
	Hours	**14**
Fall Term 5		
ECE 480	EE Senior Design I	3
ECE 491	Senior Seminar	0
ENGL 317	Technical Writing II	3

International Course		3
UPDV Technical, Major Elective Course		3
(ECE 450 AND ECE 460)		3
	Hours	**15**
Spring Term 5		
ECE 481	EE Senior Design II	3
UPDV Technical, Major Elective Course		3
American Diversity Course		3
(ECE 450 AND ECE 460)		3
(ECE 450 AND ECE 460)		3
	Hours	**15**
	Total Hours	**141**

The degree map is a guide for the timely completion of your curricular requirements. Your academic advisor or department may be contacted for assistance in interpreting this map. This map is not reflective of your academic history or transcript, and it is not official notification of completion of degree or certificate requirements. Please contact the Registrar's Office regarding your official degree/certificate completion status.

The student will be able to:

1. identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.

2. apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

3. communicate effectively with a range of audiences.

4. recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

5. function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

6. develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

7. acquire and apply new knowledge as needed, using appropriate learning strategies.