

Electrical Engineering, BS

Program Description

The Bachelor of Science Degree in Electrical Engineering provides students with necessary skills to design, analyze, and build electrical, electronic, and electromechanical systems. Electrical engineering emphasizes electrical system design and control and extends into the areas of analog circuits, digital circuits, embedded systems, signal processing, electromagnetics, semiconductor devices, and electrical power. A student with a degree from this program will be well prepared to pursue either advanced degrees in engineering or computer science, or to pursue a technical career in fields such as electrical power systems, communications, or electronics design.

Licensure Requirements

The curriculum for programs at Dixie State University customarily leading to licensure have been designed to meet the licensure/certification requirements in Utah as well as preparing students to apply for licensure exams in the State of Utah (see the licensing website (<https://dopl.utah.gov/>) for more information regarding licensure in Utah). The licensure boards in each state are responsible for establishing the requirements for licensure/certification for their state. Requirements may vary from state to state and may change at any time. Students who intend to use their DSU degree to secure licensure in any state other than Utah will need to review the professional licensure disclosures in that state pertaining to their program and consult with the state professional licensing board. For more information speak with a program advisor in the DSU academic department offering the program.

Admission Requirements

The admissions process works as follows:

1. Student applies and is accepted to DSU
2. Student designates their major as Pre-Engineering (pursuing Associate of Pre-Engineering)
3. Student passes the following courses with a C- or better:
 - MECH 1000
 - MECH 1200/05
 - MATH 1210
 - MATH 1220
 - CHEM 1210/1215
 - PHYS 2210/2215
4. Student meets with the engineering advisor to ensure that required courses are complete and to make an academic plan
5. Student's major is switched from Pre-Engineering to Electrical Engineering

Program Curriculum

123.5 credits

DSU General Education Requirements

All DSU General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to DSU's minimum General Education standards in American Institutions, English, and Mathematics.

Code	Title	Hours
General Education Core Requirements (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		
	English	3-7
	Mathematics	3-5
	American Institutions	3-6
	Life Sciences	3-10
	Physical Sciences	3-5
	Laboratory Science	0-1
	Fine Arts	3
	Literature/Humanities	3

Social & Behavioral Sciences	3
Exploration	3-5

Electrical Engineering Required Courses

Code	Title	Hours
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
ECE 2100	Semiconductor Devices	3
ECE 2700 & ECE 2705	Digital Circuits and Digital Circuits Lab	4
ECE 2280 & ECE 2285	Microelectronics and Microelectronics Lab	4
ECE 3300 & ECE 3305	Electromagnetics & Transmission Lines and Electromagnetics & Transmission Lines Lab	4
ECE 3500	Signals and Systems	3
ECE 3600 & ECE 3605	Power Electronics and Power Electronics Lab	4
ECE 3730 & ECE 3735	Embedded Systems I and Embedded Systems I Lab	4
ECE 4000	EE Product Design I	3
ECE 4010	EE Product Design II	3
ENGL 3010	Professional Writing and Business Ethics	3
MATH 1210	Calculus I (MA)	4
MATH 1220	Calculus II (MA)	4
MATH 2210	Multivariable Calculus (MA)	4
MATH 2250	Differential Equations and Linear Algebra	4
MATH 3400	Probability & Statistics	3
MECH 1000 & MECH 1005	Design: Introduction to Mechanical Design & Rapid Prototyping and Design: Introduction to Mechanical Design & Rapid Prototyping Lab	3
MECH 1200 & MECH 1205	Mechatronics: Coding and Mechatronics: Coding Lab	4
MECH 2210 & MECH 2215	Mechatronics: Circuits and Mechatronics: Circuits Lab	4
MECH 2250 & MECH 2255	Mechatronics: Sensors & Actuators and Mechatronics: Sensors & Actuators Lab	4
MECH 3200 & MECH 3205	Mechatronics: Systems & Controls and Mechatronics: Systems & Controls Lab	3.5
PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab (LAB)	5
PHYS 2220 & PHYS 2225	Physics/Scientists Engineers II and Physics/Scientists Engineers II Lab	5

Electrical Engineering Technical Electives

Code	Title	Hours
Complete 18 credits from the following:		
Any ECE 4xxx (excluding ECE 4000, 4005, 4010, 4015)		
Any MECH 4xxx (excluding MECH 4000, 4010)		
MATH 4xxx (excluding MATH 4500, 4890R, 4900)		
Any CS 4xxx (excluding CS 4600, 4920R, 4990, 4991R, 4992)		
Any CHEM 4xxx (excluding CHEM 4800R, 4910)		
MATH 3150	Introduction to Partial Differential Equations	3
MATH 3450	Statistical Inference	3
CS 3010	Mobile Application Development for Android	3

CS 3020	Mobile Application Development: iOS	3
CS 3510	Advanced Algorithms/Data Structures	3

Graduation Requirements

1. Complete 123.5 college-level credits (1000 and above)
2. Complete at least 40 upper-division credits (3000 and above)
3. Complete at least 30 upper-division credits at DSU for institutional residency
4. Cumulative GPA 2.0 or higher
5. Grade C- or better in all Electrical Engineering Required Courses and Technical Elective Courses.
6. Pass the Fundamentals of Engineering (FE) Exam

Graduation Plan - 4 years

1st Year

Fall Semester

		Hours
MECH 1000 & MECH 1005	Design: Introduction to Mechanical Design & Rapid Prototyping and Design: Introduction to Mechanical Design & Rapid Prototyping Lab	3
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
MATH 1210	Calculus I (MA)	4
ENGL 2010	Intern Writing Selected Topics: (EN)	3
Hours		15

Spring Semester

MECH 1200 & MECH 1205	Mechatronics: Coding and Mechatronics: Coding Lab	4
PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab (LAB)	5
MATH 1220	Calculus II (MA)	4
General Education (Life Science) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		16

2nd Year

Fall Semester

ECE 2700 & ECE 2705	Digital Circuits and Digital Circuits Lab	4
MECH 2210 & MECH 2215	Mechatronics: Circuits and Mechatronics: Circuits Lab	4
PHYS 2220 & PHYS 2225	Physics/Scientists Engineers II and Physics/Scientists Engineers II Lab	5
MATH 2210	Multivariable Calculus (MA)	4
Hours		17

Spring Semester

MECH 2250 & MECH 2255	Mechatronics: Sensors & Actuators and Mechatronics: Sensors & Actuators Lab	4
ECE 2280 & ECE 2285	Microelectronics and Microelectronics Lab	4
ECE 2100	Semiconductor Devices	3
MATH 2250	Differential Equations and Linear Algebra	4
Hours		15

3rd Year

Fall Semester

ECE 3730 & ECE 3735	Embedded Systems I and Embedded Systems I Lab	4
MECH 3200 & MECH 3205	Mechatronics: Systems & Controls and Mechatronics: Systems & Controls Lab	3.5

ECE 3300 & ECE 3305	Electromagnetics & Transmission Lines and Electromagnetics & Transmission Lines Lab	4
MATH 3400	Probability & Statistics	3
Hours		14.5
Spring Semester		
ECE 3600 & ECE 3605	Power Electronics and Power Electronics Lab	4
ECE 3500	Signals and Systems	3
Tech Elective 1		3
Tech Elective 2		3
General Education (Lit / Humanities) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		16
4th Year		
Fall Semester		
ECE 4000	EE Product Design I	3
ENGL 3010	Professional Writing and Business Ethics	3
Tech Elective 3		3
Tech Elective 4		3
General Education (Fine Arts) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		15
Spring Semester		
ECE 4010	EE Product Design II	3
Tech Elective 5		3
Tech Elective 6		3
General Education (American Institutions) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
General Education (Social & Behavioral Science) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		15
Total Hours		123.5

Graduation Plan - 5 years (MATH 1010)

1st Year

		Hours
Fall Semester		
MECH 1000 & MECH 1005	Design: Introduction to Mechanical Design & Rapid Prototyping and Design: Introduction to Mechanical Design & Rapid Prototyping Lab	3
ENGL 1010	Introduction to Writing (EN)	3
General Education (Life Science) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
MATH 1010	Intermediate Algebra	4
Hours		13

Spring Semester

MECH 1200 & MECH 1205	Mechatronics: Coding and Mechatronics: Coding Lab	4
MATH 1080	Pre-Calculus with Trigonometry (MA)	5
ENGL 2010	Interm Writing Selected Topics: (EN)	3
Hours		12

2nd Year

Fall Semester		
ECE 2700 & ECE 2705	Digital Circuits and Digital Circuits Lab	4
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
MATH 1210	Calculus I (MA)	4
Hours		13

Spring Semester

PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab (LAB)	5
MATH 1220	Calculus II (MA)	4
General Education (American Institutions) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		12

3rd Year**Fall Semester**

MECH 2210 & MECH 2215	Mechatronics: Circuits and Mechatronics: Circuits Lab	4
PHYS 2220 & PHYS 2225	Physics/Scientists EngineersII and Physics/Scientists Engineers II Lab	5
MATH 2210	Multivariable Calculus (MA)	4
Hours		13

Spring Semester

MECH 2250 & MECH 2255	Mechatronics: Sensors & Actuators and Mechatronics: Sensors & Actuators Lab	4
ECE 2280 & ECE 2285	Microelectronics and Microelectronics Lab	4
ECE 2100	Semiconductor Devices	3
MATH 2250	Differential Equations and Linear Algebra	4
Hours		15

4th Year**Fall Semester**

ECE 3730 & ECE 3735	Embedded Systems I and Embedded Systems I Lab	4
MECH 3200 & MECH 3205	Mechatronics: Systems & Controls and Mechatronics: Systems & Controls Lab	3.5
ECE 3300 & ECE 3305	Electromagnetics & Transmission Lines and Electromagnetics & Transmission Lines Lab	4
MATH 3400	Probability & Statistics	3
Hours		14.5

Spring Semester

ECE 3600 & ECE 3605	Power Electronics and Power Electronics Lab	4
ECE 3500	Signals and Systems	3
Tech Elective 1		3
Tech Elective 2		3
Hours		13

5th Year**Fall Semester**

ECE 4000	EE Product Design I	3
Tech Elective 3		3
Tech Elective 4		3
ENGL 3010	Professional Writing and Business Ethics	3
General Education (Fine Arts) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		15

Spring Semester

ECE 4010	EE Product Design II	3
Tech Elective 5		3
Tech Elective 6		3
General Education (Lit / Humanities) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3

General Education (Social & Behavioral Science) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)	3
Hours	15
Total Hours	135.5

Graduation Plan - 5 years (MATH 1050)

1st Year

Fall Semester

	Hours	
MECH 1000 & MECH 1005	Design: Introduction to Mechanical Design & Rapid Prototyping and Design: Introduction to Mechanical Design & Rapid Prototyping Lab	3
ENGL 1010	Introduction to Writing (EN)	3
MATH 1050	College Algebra / Pre-Calculus (MA)	4
General Education (Life Science) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
General Education (Lit / Humanities) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		16

Spring Semester

MECH 1200 & MECH 1205	Mechatronics: Coding and Mechatronics: Coding Lab	4
ENGL 2010	Intern Writing Selected Topics: (EN)	3
MATH 1060	Trigonometry (MA)	3
Hours		10

2nd Year

Fall Semester

ECE 2700 & ECE 2705	Digital Circuits and Digital Circuits Lab	4
CHEM 1210 & CHEM 1215	Principles of Chemistry I (PS) and Principles of Chemistry I Lab (LAB)	5
MATH 1210	Calculus I (MA)	4
Hours		13

Spring Semester

PHYS 2210 & PHYS 2215	Physics/Scientists Engineers I (PS) and Physics/Scientists Engineers I Lab (LAB)	5
MATH 1220	Calculus II (MA)	4
General Education (American Institutions) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		12

3rd Year

Fall Semester

MECH 2210 & MECH 2215	Mechatronics: Circuits and Mechatronics: Circuits Lab	4
PHYS 2220 & PHYS 2225	Physics/Scientists EngineersII and Physics/Scientists Engineers II Lab	5
MATH 2210	Multivariable Calculus (MA)	4
Hours		13

Spring Semester

MECH 2250 & MECH 2255	Mechatronics: Sensors & Actuators and Mechatronics: Sensors & Actuators Lab	4
ECE 2280 & ECE 2285	Microelectronics and Microelectronics Lab	4
ECE 2100	Semiconductor Devices	3
MATH 2250	Differential Equations and Linear Algebra	4
Hours		15

4th Year**Fall Semester**

ECE 3730 & ECE 3735	Embedded Systems I and Embedded Systems I Lab	4
MECH 3200 & MECH 3205	Mechatronics: Systems & Controls and Mechatronics: Systems & Controls Lab	3.5
ECE 3300 & ECE 3305	Electromagnetics & Transmission Lines and Electromagnetics & Transmission Lines Lab	4
MATH 3400	Probability & Statistics	3
Hours		14.5

Spring Semester

ECE 3600 & ECE 3605	Power Electronics and Power Electronics Lab	4
ECE 3500	Signals and Systems	3
Tech Elective 1		3
Tech Elective 2		3
Hours		13

5th Year**Fall Semester**

ECE 4000	EE Product Design I	3
Tech Elective 3		3
Tech Elective 4		3
ENGL 3010	Professional Writing and Business Ethics	3
General Education (Fine Arts) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		15

Spring Semester

ECE 4010	EE Product Design II	3
Tech Elective 5		3
Tech Elective 6		3
General Education (Social & Behavioral Science) (catalog.dixie.edu/programs/generaleducation/#gerequirementstext)		3
Hours		12
Total Hours		133.5

Electrical Engineering Program Learning Outcomes

At the successful completion of the Bachelor of Science degree in Electrical Engineering, students will be able to:

1. Formulate and evaluate complex engineering problems by applying principles of engineering, science, & mathematics.
2. Create solutions using the engineering design process that meet specified needs with appropriate consideration for relevant global, cultural, social, environment, ethical, and/or economic factors.
3. Design experiments for electrical systems or processes, analyze resulting experimental data, and make informed conclusions from the data.
4. Collaborate effectively with others to establish goals, meet deadlines, and articulate results.
5. Design, prototype, and troubleshoot electrical systems that accomplish a specified task or objective.