

B.S. in Electrical Engineering

The Bachelor of Science in Electrical Engineering provides the student with the opportunity to acquire a broad background in circuit theory, communication systems, computers, control systems, electromagnetic fields, energy sources and systems, and electronic devices. The student also gains specialization in avionics appropriate for entry-level engineering positions in the aerospace industry. Emphasis on design places the Embry-Riddle Electrical Engineering student in a unique position to increase employment opportunities after graduation.

The overall objective of the Electrical Engineering program at Prescott is to produce graduates who will be successful practitioners of electrical engineering. The program objectives to measure our accomplishment of this goal are engineers who:

- Demonstrate achievements in their chosen profession
- Contribute to the development of the profession
- Engage in professional growth and behave ethically
- Contribute to the welfare of society through service

The Electrical Engineering (B.S.) program is accredited by the Engineering Accreditation Commission of ABET, <https://www.abet.org>, under the General Criteria and the Electrical, Computer, Communications, Telecommunication(s) and Similarly Named Engineering Programs Program Criteria.

Students will:

- Have an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- Have an ability to 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.
- Have an ability to communicate effectively with a range of audiences.
- Have an ability to 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.
- Have an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- Have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- Have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Degree Requirements

The Bachelor of Science in Electrical Engineering requires the successful completion of a minimum of 125 credit hours. Students should be aware that several courses in each academic year may have prerequisites and/or corequisites. The B.S. degree requires a minimum cumulative grade point average of 2.00 in all EE, ES, CEC, EGR, and CS courses that fulfill any degree requirement.

The Electrical Engineering degree includes a space option in which EP 394, AE 427, and AE 445 will be taken for the ES elective, EE 420, and EE 421.

Students who are interested in robotics may take a robotics track within the EE program. The suggested program of study follows the regular EE degree plan.

Electrical engineering majors are required to have a grade of C or better in all prerequisite courses for courses with the CS, CEC, EE, EGR, ES, or SE prefixes specifically listed in the catalog as required for the major.

Program Requirements

General Education

Embry-Riddle degree programs require students to complete a minimum of 36 hours of General Education coursework. For a full description of Embry-Riddle General Education guidelines, please see the General Education section of this catalog.

Students may choose other classes outside of their requirements, but doing so can result in the student having to complete more than the degree's 125-126 credit hours. This will result in additional **time and cost** to the student.

Communication Theory and Skills	9
Computer Science/Information Technology	3
Mathematics	6
Physical and Life Sciences (Natural Sciences)	6
Humanities and Social Sciences	12
3 hours of lower-level Humanities	
3 hours of lower-level Social Science	
3 hours of lower-level or upper-level Humanities or Social Science	
3 hours of upper-level Humanities or Social Science	
Total Credits	36

Electrical Engineering Core (110 Credits)

The following course of study outlines the quickest and most cost-efficient route for students to earn their B.S. in Electrical Engineering. Students are encouraged to follow the course of study to ensure they complete all program required courses and their prerequisites within four years.

Courses in the core with a # will satisfy general education requirements.

CEC 220	Digital Circuit Design	3
CEC 222	Digital Circuit Design Laboratory	1
CEC 320	Microprocessor Systems	3
CEC 322	Microprocessor Systems Laboratory	1
COM 122	English Composition #	3
COM 219	Speech #	3
COM 221	Technical Report Writing (Must earn a C or better to pass COM 221) #	3
CS 125	Computer Science I #	4
EC 225	Engineering Economics #	3
EE 223	Linear Circuits Analysis I **	3
EE 224	Electrical Engineering Laboratory I **	1
EE 302	Electronic Devices and Circuits *	3
EE 304	Electronic Circuits Laboratory *	1
EE 314	Signal and Linear System Analysis *	3
EE 315	Signal and Linear System Analysis Laboratory *	1
EE 340	Electric and Magnetic Fields **	3
EE 401	Control Systems Analysis and Design **	3
EE 402	Control Systems Laboratory **	1
EE 410	Communication Systems *	3
EE 412	Communication Systems Laboratory *	1
EE 420	Electrical Engineering Capstone I *	3
EE 421	Electrical Engineering Capstone II **	3
EE 450	Elements of Power Systems *	3
EE 452	Power Systems Laboratory *	1
EGR 101	Introduction to Engineering	2
EGR 115	Introduction to Computing for Engineers	3

2 B.S. in Electrical Engineering

ES 207	Fundamentals of Mechanics *	3
ES 312	Energy Transfer Fundamentals	3
ES Core Selection (See course list below)		3
General Education - lower-level or upper-level Humanities or Social Science #		3
General Education - lower-level Humanities #		3
HU 330	Values and Ethics #	3
or HU 335	Technology and Modern Civilization	
MA 241	Calculus and Analytical Geometry I #	4
MA 242	Calculus and Analytical Geometry II #	4
MA 243	Calculus and Analytical Geometry III	4
MA 345	Differential Equations and Matrix Methods	4
MA 412	Probability and Statistics	3
MA 441	Mathematical Methods for Engineering and Physics I	3
PS 161	Physics I & II for Engineers #	4
PS 250	Physics for Engineers III #	3
PS 253	Physics Laboratory for Engineers #	1

Advanced Electives (6-7 Credits)

Advanced Electives / EE 4XX (selected from a list provided by the department chair)	6-7
---	-----

Technical Electives (9 Credits)

Technical Electives	9
---------------------	---

Technical electives include EGR 200, EGR 201, CS 225, SIS 365, and any AE, CEC, CEXX (Coop/Internship), CS, EE, EP, ES, MA, ME, PS, SE, or SYS course 300 level or above. Other courses may be approved by the CESE Department Chair.

ROTC Exceptions must be approved by the CESE Department Chair.

Total Credits	125-126
----------------------	----------------

ES Core Selection (3 Credits)

EGR 200	Computer Aided Design of Aerospace Systems	3
EGR 201	Computer Aided Design of Mechanical Systems	3
EGR 402	Application of Advanced CATIA Methods	3
EP 394	Space Systems Engineering	3
ES 206	Fluid Mechanics	3
ES 306	Fiber Optics	3
ES 315	Space Environment and Effects	3
ES 320	Engineering Materials Science	3
& ES 321	and Engineering Materials Science Laboratory	
ES 322	Aerospace Engineering Failure	3
& ES 323	and Aerospace Engineering Failure Laboratory	
ES 324	Measurements and Instrumentation	3
& ES 325	and Measurements and Instrumentation Lab	
ES 412	Structural Dynamics	3

Other courses may be approved by the CESE Department Chair - Example: Directed Study

Robotics Option

Electrical Engineering Core (122 Credits)

CEC 220	Digital Circuit Design	3
CEC 222	Digital Circuit Design Laboratory	1
CEC 320	Microprocessor Systems	3
CEC 322	Microprocessor Systems Laboratory	1
COM 122	English Composition #	3
COM 221	Technical Report Writing #	3
COM 420	Advanced Technical Communication I #	1

COM 430	Advanced Technical Communication II #	2
CS 125	Computer Science I #	4
EC 225	Engineering Economics #	3
EE 223	Linear Circuits Analysis I **	3
EE 224	Electrical Engineering Laboratory I **	1
EE 302	Electronic Devices and Circuits *	3
EE 304	Electronic Circuits Laboratory *	1
EE 314	Signal and Linear System Analysis *	3
EE 315	Signal and Linear System Analysis Laboratory	1
EE 340	Electric and Magnetic Fields **	3
EE 401	Control Systems Analysis and Design **	3
EE 402	Control Systems Laboratory **	1
EE 410	Communication Systems *	3
EE 412	Communication Systems Laboratory *	1
EE 450	Elements of Power Systems *	3
EE 452	Power Systems Laboratory *	1
EGR 101	Introduction to Engineering	2
EGR 115	Introduction to Computing for Engineers	3
ES 204	Dynamics	3
ES 207	Fundamentals of Mechanics *	3
ES 312	Energy Transfer Fundamentals **	3
General Education - lower-level or upper-level Humanities or Social Science #		3
General Education - lower-level Humanities #		3
HU 330	Values and Ethics #	3
or HU 335	Technology and Modern Civilization	
MA 241	Calculus and Analytical Geometry I #	4
MA 242	Calculus and Analytical Geometry II #	4
MA 243	Calculus and Analytical Geometry III	4
MA 335	Introduction to Linear and Abstract Algebra	3
MA 345	Differential Equations and Matrix Methods	4
MA 412	Probability and Statistics	3
MA 441	Mathematical Methods for Engineering and Physics I	3
ME 302	Introduction to Robotics I *	3
ME 406	Robotics II **	3
ME 406L	Robotics II Laboratory **	1
ME 407	Preliminary Design for Robotic Systems with Laboratory *	4
ME 420	Detail Design of Robotic Systems with Laboratory *	4
PS 161	Physics I & II for Engineers #	4
PS 250	Physics for Engineers III #	3
PS 253	Physics Laboratory for Engineers #	1

Advanced Electives (3-4 Credits)

Advanced Electives (selected from a list provided by the department chair)	3-4
--	-----

Total Credits	125-126
----------------------	----------------

* Offered in Fall Only

** Offered in Spring Only

General Education Course

UNIV 101 is taken in excess of degree requirements.

All Army ROTC students are required to complete SS 321 - U.S. Military History 1900-Present (3 credits) in order to commission.

Electrical Engineering - General**Freshman Year**

Fall		Credits
COM 122	English Composition	3
	Humanities or Social Science Lower-Level or Upper-Level Elective	3
EGR 101	Introduction to Engineering	2
EGR 115	Introduction to Computing for Engineers	3
MA 241	Calculus and Analytical Geometry I	4
UNIV 101	College Success	(1)
Credits Subtotal		15.0

Spring

CEC 220	Digital Circuit Design	3
CEC 222	Digital Circuit Design Laboratory	1
	Humanities Lower-Level Elective	3
MA 242	Calculus and Analytical Geometry II	4
PS 161	Physics I & II for Engineers	4
Credits Subtotal		15.0

Sophomore Year

Fall		Credits
COM 221	Technical Report Writing (Must earn a C or better to pass COM 221)	3
CS 125	Computer Science I	4
MA 243	Calculus and Analytical Geometry III	4
PS 250	Physics for Engineers III	3
PS 253	Physics Laboratory for Engineers	1
Credits Subtotal		15.0

Spring

CEC 320	Microprocessor Systems	3
CEC 322	Microprocessor Systems Laboratory	1
COM 219	Speech	3
EE 223	Linear Circuits Analysis I	3
EE 224	Electrical Engineering Laboratory I	1
MA 345	Differential Equations and Matrix Methods	4
Credits Subtotal		15.0

Junior Year

Fall		Credits
EE 302	Electronic Devices and Circuits	3
EE 304	Electronic Circuits Laboratory	1
EE 314	Signal and Linear System Analysis	3
EE 315	Signal and Linear System Analysis Laboratory	1
ES 207	Fundamentals of Mechanics	3
MA 441	Mathematical Methods for Engineering and Physics I	3
	Technical Elective	3
Credits Subtotal		17.0

Spring

EE 340	Electric and Magnetic Fields	3
EE 401	Control Systems Analysis and Design	3
EE 402	Control Systems Laboratory	1
	Engineering Science Core Selection	3
ES 312	Energy Transfer Fundamentals	3
MA 412	Probability and Statistics	3
Credits Subtotal		16.0

Senior Year

Fall		Credits
EE 410	Communication Systems	3
EE 412	Communication Systems Laboratory	1

EE 420	Electrical Engineering Capstone I	3
EE 450	Elements of Power Systems	3
EE 452	Power Systems Laboratory	1
	Technical Electives	6
Credits Subtotal		17.0

Spring

	Advanced Electives / EE 4xx	6-7
EC 225	Engineering Economics	3
EE 421	Electrical Engineering Capstone II	3
HU 330	Values and Ethics	3
	or HU 335 Technology and Modern Civilization	
Credits Subtotal		15.0-16.0
Credits Total:		125.0-126.0

Robotics Track**Freshman Year**

Fall		Credits
COM 122	English Composition	3
	Humanities or Social Science Lower-Level or Upper-Level Elective	3
EGR 101	Introduction to Engineering	2
EGR 115	Introduction to Computing for Engineers	3
MA 241	Calculus and Analytical Geometry I	4
UNIV 101	College Success	(1)
Credits Subtotal		15.0

Spring

CEC 220	Digital Circuit Design	3
CEC 222	Digital Circuit Design Laboratory	1
	Humanities Lower-Level Elective	3
MA 242	Calculus and Analytical Geometry II	4
PS 161	Physics I & II for Engineers	4
Credits Subtotal		15.0

Sophomore Year

Fall		Credits
COM 221	Technical Report Writing (Must earn a C or better to pass COM 221)	3
CS 125	Computer Science I	4
ES 207	Fundamentals of Mechanics	3
MA 243	Calculus and Analytical Geometry III	4
PS 250	Physics for Engineers III	3
Credits Subtotal		17.0

Spring

CEC 320	Microprocessor Systems	3
CEC 322	Microprocessor Systems Laboratory	1
EE 223	Linear Circuits Analysis I	3
EE 224	Electrical Engineering Laboratory I	1
MA 335	Introduction to Linear and Abstract Algebra	3
MA 345	Differential Equations and Matrix Methods	4
PS 253	Physics Laboratory for Engineers	1
Credits Subtotal		16.0

Junior Year

Fall		Credits
EE 302	Electronic Devices and Circuits	3
EE 304	Electronic Circuits Laboratory	1
EE 314	Signal and Linear System Analysis	3
EE 315	Signal and Linear System Analysis Laboratory	1
ES 204	Dynamics	3
MA 441	Mathematical Methods for Engineering and Physics I	3

4 B.S. in Electrical Engineering

ME 302	Introduction to Robotics I	3
Credits Subtotal		17.0
Spring		
EE 340	Electric and Magnetic Fields	3
EE 401	Control Systems Analysis and Design	3
EE 402	Control Systems Laboratory	1
ES 312	Energy Transfer Fundamentals	3
MA 412	Probability and Statistics	3
ME 406	Robotics II	3
ME 406L	Robotics II Laboratory	1
Credits Subtotal		17.0
Senior Year		
Fall		
COM 420	Advanced Technical Communication I	1
EE 410	Communication Systems	3
EE 412	Communication Systems Laboratory	1
EE 450	Elements of Power Systems	3
EE 452	Power Systems Laboratory	1
ME 407	Preliminary Design for Robotic Systems with Laboratory	4
Credits Subtotal		13.0
Spring		
	Advanced Electives / EE 4XX	3-4
COM 430	Advanced Technical Communication II	2
EC 225	Engineering Economics	3
HU 330	Values and Ethics	3
or HU 335	Technology and Modern Civilization	
ME 420	Detail Design of Robotic Systems with Laboratory	4
Credits Subtotal		15.0-16.0
Credits Total:		125.0-126.0