

GENERAL ENGINEERING (BS)

Program Description

The BS in General Engineering degree combines the fundamentals of electrical, mechanical, and computer engineering with a focused depth in one of these areas. It also allows you freedom to choose more engineering courses (for instance to focus on robotics or energy) or to venture into broader areas of your choosing such as ecology, bioengineering, business, etc.

The BS in General Engineering degree is accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org/>).

Entering and Completing the Major

In order to earn a degree, you must complete at least one academic major. SPU encourages students to explore various academic paths, so if you change your mind about a major, or want to include an additional program, you are able to do so, as outlined below.

Note that the University encourages you to enter your chosen major(s) as soon as you have determined it and are eligible to join it, especially by the start of your junior year. Students who transfer as juniors and seniors should enter a major within their first two quarters at SPU.

- If this is your first quarter at SPU and you identified a major in this department as your first choice on your application for admission to the University, you have gained entry to the major. To change or add a major, follow these instructions (<https://spu.atlassian.net/1/cp/a3th1keb/>).
- If you are an SPU student with an SPU cumulative GPA of 2.0 or better, follow these instructions (<https://spu.atlassian.net/1/cp/a3th1keb/>) to enter a major in this department.
- The University requires a grade of C- or better in all classes that apply to a major; however, programs may require higher minimum grades in specific courses. You may repeat an SPU course only once for a higher grade.
- To advance in this program, meet with your faculty advisor regularly to discuss your grades, course progression, and other indicators of satisfactory academic progress. If your grades or other factors indicate that you may not be able to successfully complete the major or minor, your faculty advisor can work with you to explore options, which may include choosing a different major.
- You must complete the major requirements that are in effect in the SPU Undergraduate Catalog for the year you enter the major.

General Engineering (BS)

131 Credits Minimum, Including 45 Upper Division (UD)

Code	Title	Credits
Mathematics Requirements		
MAT 1234	Calculus I	5
MAT 1235	Calculus II	5
MAT 1236	Calculus III	5
MAT 2401	Linear Algebra	3
MAT 3237	Differential Equations	3
EGR 2200	Engineering Probability and Statistics	3
or MAT 2200	Engineering Probability and Statistics	
Section Credits Required		24

Science Requirements

CHM 1211	General Chemistry I	5
or CHM 1310	Survey of General Chemistry	
PHY 1121	Physics for Science and Engineering	5
PHY 1122	Physics for Science and Engineering	5
PHY 1123	Physics for Science and Engineering	5
Section Credits Required		20

Math/Science Breadth Requirement

CHM 1212	General Chemistry II	
CHM 1330	Survey of Organic Chemistry	
MAT 1720	Mathematics for Computer Science	
MAT 3000	Foundations of Mathematics	
MAT 3238	Vector Calculus	
PHY 2321	Intermediate Physics	
PHY 3110	Mechanical Modeling and Analysis	
PHY 3315	Electricity and Magnetism I	
Section Credits Required		3

Engineering and Computer Science Requirements

CSC 1230	Problem Solving and Programming	5
or CSC 2230	Computer Programming for Engineers	
EE 1210	Introduction to Logic System Design	5
EE 1502	Electrical and Computer Engineering Fundamentals	1
EE 2726	Electric Circuits I	5
EE 2727	Electric Circuits II	4
EGR 1501	Computer Aided Design Applications for Engineers	1
EGR 1502	Machining and Fabricating	1
EGR 1503	Engineering Tools and Systems	1
EGR 3000	Principles of Professional Practice	1
or GS 3001	Internship and Job Search Strategies	
EGR 3810	General Engineering Design	5
EGR 4811	Engineering Senior Design I	3
or EE 4211	Electrical Engineering Senior Design I	
EGR 4812	Engineering Senior Design II	3
or EE 4212	Electrical Engineering Senior Design II	
EGR 4899	Engineering Capstone and Senior Design	3
or EE 4899	Electrical Engineering Capstone and Senior Design	
EGR 4941	Engineering Professional Experience ¹	1
ME 2891	Statics	4
ME 3310	Mechanics of Materials	4
ME 3500	Thermal Science I: Thermodynamics	5
Section Credits Required		52

Engineering Concentration Requirements (select one of the following sets of courses)

CSC 2430	Data Structures I	
& EE 3760	and Computer Organization and Assembly	
& EE 3280	Language	
	and Microcontroller System Design	
EE 3028	Electric Circuits III	
& EE 3721	and Electronics I - Analog Devices and Circuits	
& EE 3722	and Electronics II Analog Electronics	
ME 3400	Dynamics	
& ME 3501	and Thermal Science II: Fluid Mechanics	
& ME 3502	and Thermal Science III: Heat Transfer	

ME 3400 & ME 3430 & ME 4410	Dynamics and System Dynamics and Mechanical Design	
Section Credits Required		14
Electives ²		18
Total Credits		131

¹ A tech internship or professional experience must be approved before enrolling in EGR 4941 and completed before passing EGR 4941.

² Electives must be chosen from approved EGR, CPE, EE, ME or non-engineering courses (at least 2 credits must be in engineering or computer science). These will be selected to meet the student's goals and must be approved by the Chair of General Engineering.

Suggested Course Sequence

Course	Title	Credits
Freshman		
Autumn		
MAT 1234	Calculus I	5
PHY 1121	Physics for Science and Engineering	5
UCOL 1000	University Colloquium ¹	1
EGR 1502	Machining and Fabricating	1
Select one of the following:		5
WRI 1000	Academic Inquiry and Writing Seminar	
UFDN 1000	The Christian Faith	
Credits		17
Winter		
EGR 1501	Computer Aided Design Applications for Engineers	1
MAT 1235	Calculus II	5
EE/CPE 1502	Electrical and Computer Engineering Fundamentals	1
PHY 1122	Physics for Science and Engineering	5
Select one of the following:		5
WRI 1000	Academic Inquiry and Writing Seminar	
UFDN 1000	The Christian Faith	
WRI 1100	Disciplinary Research and Writing Seminar ²	
Credits		17
Spring		
EGR 1503	Engineering Tools and Systems	1
PHY 1123	Physics for Science and Engineering	5
MAT 1236	Calculus III	5
Select one of the following:		5
UFDN 1000	The Christian Faith	
WRI 1000	Academic Inquiry and Writing Seminar	
WRI 1100	Disciplinary Research and Writing Seminar ²	
Credits		16
Sophomore		
Variable		
Common Curriculum (https://catalog.spu.edu/undergraduate/degree-requirements/baccalaureate-degree-requirements/common-curriculum/) and Exploratory Curriculum (https://catalog.spu.edu/undergraduate/degree-requirements/baccalaureate-degree-requirements/exploratory-curriculum/)		
CSC 1230 or CSC 2230	Problem Solving and Programming ³ or Computer Programming for Engineers	5
Work with advisor to plan which of the courses below will be taken during sophomore year vs junior year.		
Credits		5
Autumn		
EE 1210	Introduction to Logic System Design	5
ME 2891	Statics	4
EE 2726 & 2726L	Electric Circuits I and Electric Circuits I Lab	5

CHM 1211 or CHM 1310	General Chemistry I or Survey of General Chemistry	5
Credits		19
Winter		
MAT 3237	Differential Equations	3
EE 2728	Electric Circuits II - Expanded	5
ME 3310	Mechanics of Materials	4
CHM 1310 or CHM 1211	Survey of General Chemistry or General Chemistry I	5
Credits		17
Spring		
Engineering Concentration Course 1		4-5
MAT 2200	Engineering Probability and Statistics	3
MAT 2401	Linear Algebra	3
Math or Science Breadth Course ⁴		3
Credits		13-14
Junior		
Variable		
Engineering Concentration Sequence Courses 2 & 3 ⁵		9-10
Approved Internship ⁶		
Approved Electives ⁷		
Common Curriculum (https://catalog.spu.edu/undergraduate/degree-requirements/baccalaureate-degree-requirements/common-curriculum/) and Exploratory Curriculum (https://catalog.spu.edu/undergraduate/degree-requirements/baccalaureate-degree-requirements/exploratory-curriculum/)		
Credits		9-10
Autumn		
GS 3001	Internship and Job Search Strategies	1
ME 3500	Thermal Science I: Thermodynamics	5
Credits		6
Spring		
EGR 3810 or EE 3730	General Engineering Design or Engineering Design	5
Credits		5
Senior		
Variable		
Approved Electives ⁷		18
EGR 4941	Engineering Professional Experience ⁸	1
Common Curriculum (https://catalog.spu.edu/undergraduate/degree-requirements/baccalaureate-degree-requirements/common-curriculum/) and Exploratory Curriculum (https://catalog.spu.edu/undergraduate/degree-requirements/baccalaureate-degree-requirements/exploratory-curriculum/)		
Credits		39
Autumn		
EGR 4811	Engineering Senior Design I	3
Credits		3
Winter		
EGR 4812	Engineering Senior Design II	3
Credits		3
Spring		
EGR 4899	Engineering Capstone and Senior Design	3
Credits		3
Total Credits		172-174
Code	Title	Credits
Common Curriculum		
UCOR 2000	The Emergence of the Modern Global Systems	5
UFDN 2000	Christian Scripture	5
UCOR 3000	Faith, Philosophy, and Science	5
UFDN 3100	Christian Theology	5
Exploratory Curriculum		

WK-Arts, WK-Hum, WK-Social Science, WE (and CUE) With DTA or AA 20
see Advisor

- ¹ UCOL 1000 University Colloquium should be the section taught by an engineering faculty member.
- ² WRI 1000 Academic Inquiry and Writing Seminar must be taken before WRI 1100 Disciplinary Research and Writing Seminar. The WRI 1100 Disciplinary Research and Writing Seminar should be the section taught by an engineering faculty member.
- ³ Note that CSC 1230 is a pre-req for some optional later courses.
- ⁴ See Degree Requirements list in the catalog.
- ⁵ Relevant prereqs will depend on concentration sequence.
- ⁶ This is also a prerequisite for EGR 4941 Engineering Professional Experience. See ECS Intern Canvas site for details.
- ⁷ To be taken in junior or senior year. See link at the bottom of this page for a list.
- ⁸ Completion of an approved internship or certification is a required pre-req.

Technical Electives List

See the Requirements (p. 1) tab for a complete list of technical electives.