ENGINEERING (BSE)

Students wishing to study General Engineering will declare their major as simply "Engineering." This major offers an accredited engineering degree with career flexibility. General Engineering students are required to take the same core courses common to other engineering majors at Baylor, plus additional upper-level classes in both Electrical and Computer Engineering and Mechanical Engineering. This program is intended for students who desire a broader, less specialized exposure to the engineering disciplines, who are seeking a career outside of the typical career paths of Electrical and Computer Engineering or Mechanical Engineering, or who wish to supplement their engineering degrees with an additional area of study. Graduates of this program, depending on their choice of concentration or minor(s), will be well-qualified to enter diverse fields such as patent law, medicine, petroleum and energy, biomedical engineering, public policy, or humanitarian engineering.

Students studying within the Biomedical Engineering concentration apply engineering principles and problem-solving strategies to design and create technologies, including medical devices, imaging systems, and instrumentation, for improving human health. It is highly interdisciplinary, combining chemical, electrical, and mechanical engineering principles with biological and physiological understanding. Graduates may apply to continue their education in graduate or medical school or seek employment within a research and development or clinical environment.

The Humanitarian Engineering concentration is designed to prepare students to be engineers in the non-profit sector. Students graduating with the Humanitarian Engineering (HE) concentration might work on projects such as refugee shelter design, water well access in developing countries, or renewable energy systems for remote clinics, for example. Whether working in support of governments, private companies, non-profit organizations, or Christian mission groups, HE students will be exposed to the ethics and cultural humility, technologies, social enterprise, and environmental issues they are likely to encounter working in this sector.

General Engineering Mission Statement

The mission of the General Engineering program is to educate students in the disciplines of engineering within a caring Christian environment. We want our graduates to be motivated by Christian ideals and view their career as a lifelong commitment to others. We strive to provide our students with a technical foundation that is both broad and strong, with an emphasis on professional, moral, ethical, and leadership development.

BSE Program Educational Objectives

Within a few years after graduation, Baylor BSE graduates will:

- Establish themselves as competent, successful, and responsible members within their chosen career vocation.
- Make career and professional judgments, including moral and ethical considerations, informed by Christian ideals.
- Pursue opportunities for new knowledge and advancing skills through venues such as post-baccalaureate studies, continuing education, or mission field training.

BSE Expected Graduate Outcomes

In support of the program objectives, graduates of the program must demonstrate that they have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. 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
3. an ability to communicate effectively with a range of audiences
4. 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
5. 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
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Degree Requirements: BSE - Engineering

Code	Title	Hours
Required Courses		
Minimum 124 hours including the following:		
Literature and Writing		
ENG 1310	Research Writing: Writing and Academic Inquiry Seminars	3
GTX 2301	Intellectual Traditions of the Ancient World : Literature and Thought	3
or GTX 2302	Medieval Intellectual Traditions: Literature and Thought in Context	
PWR 3300	Technical Writing	3
Religion		
REL 1310	The Christian Scriptures	3
REL 1350	The Christian Heritage	3
Foreign Language and Culture		
Foreign Language and Culture Distribution List (ECS) (https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/#EN-FLC-DL)		3
Other Requirements		
PSC 1387	The U.S. Constitution, Its Interpretation, and the American Political Experience	3
or ENG 2301	British Literature	
EGR 2108	Engineering Economics	1
EGR 3305	Social and Ethical Issues in Engineering	3
EGR 1101	Engineering New Student Experience	1
Lifetime Fitness: Any two LF 11XX courses. ECS 2101 and select leadership courses may fulfill one of the Lifetime Fitness requirements.		2
Chapel: Two Semesters		0
General Elective Credit		1
Mathematics and Basic Sciences		
CHE 1301	Basic Principles of Modern Chemistry I	3
MTH 1321	Calculus I	3

MTH 1322	Calculus II	3
MTH 2311	Linear Algebra	3
MTH 2321	Calculus III	3
MTH 3325	Ordinary Differential Equations	3
STA 3381	Probability and Statistics	3
PHY 1420	General Physics I	4
PHY 1430	General Physics II	4
Select one course from the following:		3
Math/Science Restricted Electives for ENGR Majors (p. 2)		
Engineering Major		
Required Courses		
EGR 1301	Introduction to Engineering	3
EGR 1302	Introduction to Engineering Analysis	3
EGR 3380	Engineering Design I	3
EGR 4390	Engineering Design II	3
ME 2320	Statics	3
ME 2321	Dynamics	3
ME 2345	Thermodynamics	3
ME 3420	Instrumentation and Measurements	4
ELC 2330 & ELC 2130	Electrical Circuit Theory and Electrical Circuit Laboratory	4
ELC 3335	Signals and Systems	3
Select one of the following:		4
ELC 2337 & ELC 2137	Digital Logic Design and Digital Logic Design Laboratory	
CSI 1401	Introduction to Programming I	
CSI 1430	Introduction to Computer Science I with Laboratory	
Engineering Electives		
Select nine credit hours of BME/ME/ELC/EGR courses. Three credit hours may be 3000-level, while the other six elective credits must be 4000-level.		9
Concentration		
Select a minimum of 18 hours from the following:		18
Any minor offered by the university other than Engineering or Mathematics. Note that an additional minor in Mathematics can be completed by the proper choice of "One additional 3000- or 4000-level approved math or science class," but it will not satisfy this requirement.		
OR an established targeted concentration in one of the following:		
Biomedical Concentration (https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/engineering/engineering-bse/biomedical/) [1]		
Humanitarian Concentration (https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/engineering/engineering-bse/humanitarian/) [2]		
Energy and Environment Concentration (https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/engineering/engineering-bse/environmental/) [3]		
Engineering Fellows (https://catalog.baylor.edu/undergraduate/school-engineering-computer-science/engineering/engineering-bse/fellows/) [4]		
A grade of "C" or better in all of the Engineering hours counted towards the major.		
Total Hours		**124**

1. The Biomedical concentration requires specific biomedical engineering courses in biomaterials, biomechanics, and bioinstrumentation. This concentration has 19 hours.
2. The Humanitarian concentration is aimed toward engineers who wish to pursue missions-related careers in bettering the lives of populations in developing countries.
3. The Energy and Environmental concentration will prepare students to professionally contribute to industry or government policy regarding energy production, transmission, and storage with additional insight into the effects of these technologies on our environment.
4. The Engineering Fellows Program at Baylor University offers students a strong foundation in engineering while integrating another discipline into their studies. Designed for those with specific career goals, it provides a unique, interdisciplinary educational experience beyond traditional engineering. This program prepares forward-thinking engineers with diverse skills to address complex challenges across multiple fields.

Math/Science Restricted Electives - Engineering Majors

Code	Title	Hours
CHE 3331	Organic Chemistry I	3
MTH 3300	Foundations of Mathematics	3
MTH 3312	Combinatorics and Algebra	3
MTH 3323	Introduction to Analysis	3
MTH 3324	Numerical Methods	3
MTH 3326	Partial Differential Equations	3
MTH 3350	Structure of Modern Geometry	3
MTH 3370	Mathematical Methods of Operations Research	3
MTH 3374	Introduction to Mathematical Modeling	3
MTH 4312	Cryptology	3
MTH 4313	Number Theory	3
MTH 4314	Abstract Algebra	3
MTH 4316	Linear Algebra and Matrix Theory	3
MTH 4322	Numerical Analysis	3
MTH 4324	Systems of Ordinary Differential Equations	3
MTH 4326	Principles of Mathematical Analysis I	3
MTH 4327	Principles of Mathematical Analysis II	3
MTH 4328	Numerical Linear Algebra	3
MTH 4329	Theory of Functions of a Complex Variable	3
MTH 4375	Linear Programming	3