AEROSPACE ENGINEERING (BSAE)

The Aerospace Engineering curriculum consists of courses designed to equip students to work in the aeronautics or astronautics industries. Aerospace Engineering students will study aerodynamics, aerospace structures, air-breathing and rocket propulsion, aircraft flight dynamics, orbital mechanics, and space flight. They will have experience in both aircraft and spacecraft design. Additionally, students will gain core engineering competencies, such as engineering problem-solving skills and knowledge of engineering materials, thermodynamics, numerical methods, dynamic systems, and computer-aided design. Technical electives give students flexibility to explore topics such as computational fluid dynamics, finite element methods, and composite materials.

Aerospace Engineering Mission Statement

The mission of the Aerospace Engineering undergraduate program is to educate students, within a caring Christian environment, in the discipline of aerospace engineering. Our graduates will be equipped with the fundamental technical, communication, and teamwork skills to succeed in their chosen careers. They will be empowered by innovative problem-solving creativity and an entrepreneurial mindset. They will be motivated by Christian ideals and a vocational calling to improve the quality of life worldwide.

BSAE Program Educational Objectives

Within a few years after graduation, Aerospace Engineering graduates will:

- Have a career informed by Christian ideals and a vocational calling to improve people's quality of life worldwide.
- Be recognized as competent, successful, and ethical in their profession or in advanced study, in engineering or a related field.
- Be equipped and motivated to pursue knowledge and develop skills within their profession through graduate school or by continuing education

BSAE 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: BSAE - Aerospace Engineering Major

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 1101	Engineering New Student Experience	1
EGR 2108	Engineering Economics	1
EGR 3305	Social and Ethical Issues in Engineering	3
or EGR 3315	Ethics of International Service	
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
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
PHY 1420	General Physics I	4
PHY 1430	General Physics II	4
STA 3381	Probability and Statistics	3
Aerospace Engineering Major		
Required Courses		
EGR 1301	Introduction to Engineering	3
EGR 1302	Introduction to Engineering Analysis	3
EGR 2170	Introduction to Computer Aided Design	1
ELC 2320	Electric Circuit Theory for non-ECE majors	3

ME 2320	Statics	3
ME 2321	Dynamics	3
ME 2345	Thermodynamics	3
ME 2346	Introduction to Aeronautics and Astronautics	3
ME 3122	Materials and Manufacturing Processes Lab	1
ME 3145	Thermal/Fluids Laboratory	1
ME 3320	Mechanics of Materials	3
ME 3322	Mechanical Engineering Materials and Manufacturing Processes	3
ME 3346	Aerodynamics	3
ME 3349	Aerospace Structures	3
ME 3420	Instrumentation and Measurements	4
ME 4325	Dynamic Systems	3
ME 4327	Numerical Methods for Engineers	3
ME 4334	Gas Dynamics	3
ME 4350	Aircraft Flight Dynamics and Control	3
ME 4355	Orbital Mechanics and Space Flight	3
ME 4391	Aerospace Design I	3
ME 4392	Aerospace Design II	3
Select one course from the following:		3
ME 4347	Analysis and Design of Propulsion Systems	
ME 4354	Rocket Propulsion	
Engineering Electives		
Select one course from the following:		3
BME 4379	Biosensors and Nanomaterials	
BME 4360	Introduction to Biomedical Engineering	
BME 4370	Biomaterials: Form and Function	
BME 4374	Biomechanics	
BME 4376	Introduction to the Design and Evaluation of Medical Devices	
BME 4396	Special Topics in Biomedical Engineering	
EGR 3V95	Internship Experience	
EGR 4361	Conventional & Alternative Energy Systems	
EGR 4375	Elements of Nuclear Engineering	
EGR 4396	Special Topics in Engineering	
EGR 4V97	Special Projects in Engineering	
ME 3345	Thermodynamics II	
ME 4305	Sustainable Engineering	
ME 4320	Computer-Aided Structural Analysis	
ME 4322	Computer-Aided Engineering and Design	
ME 4323	Mechanical Vibrations	
ME 4324	Introduction to Finite Element Methods	
ME 4330	Introduction to Robotics	
ME 4336	Thermal Systems Design	
ME 4337	Introduction to Computational Fluid Dynamics	
ME 4339	Tribology	
ME 4343	Introduction to Computational Fluid Dynamics	
ME 4344	Composite Materials	
ME 4345	Heat Transfer	
ME 4357	Cardiovascular Engineering and Instrumentation	
ME 4360	Renewable Energy Devices	
ME 4364	Introduction to Additive Manufacturing	
ME 4362	Principles of Process Engineering	
ME 4363	Advanced Concepts of Process Engineering	
ME 4377	Solar Energy	
ME 4380	Microscopy Techniques for Material Science	
ME 4381	Advanced Mechanics of Materials	
ME 4382	Selection of Materials and Manufacturing Processes in Design	
ME 4384	Engineering with Plastics	
ME 4385	Failure Analysis and Product Liability	
ME 4386	Properties and Processing of Electronic Materials	
ME 4388	Corrosion and Sustainable Metallurgy	
ME 4396	Special Topics in Mechanical Engineering	
ME 4V97	Special Projects in Mechanical Engineering	
A grade of "C" or better in all of the Aerospace Engineering hours counted towards the major.		
Total Hours		**124**