

BACHELOR OF SCIENCE IN AEROSPACE ENGINEERING

The first year focuses on coursework in the areas of chemistry, mathematics, physics, humanities, social sciences. The second year adds coursework in general engineering sciences and aerospace specific disciplines. The third and fourth years emphasize aerospace disciplines, vehicle systems integration and design, and Options courses that allow students to individualize their education. The undergraduate curriculum is designed to provide each student with a general background for employment in industry or government, or advanced study in graduate school at the end of four years. The program stresses the analytical, experimental, and design aspects of aerospace engineering. A certain degree of specialization is available to undergraduate students through the proper choice of Options and through a choice of air- or space-focused tracks. In addition, opportunities for undergraduate research and team competition courses are available, depending on the student's abilities and career objectives. Courses do not have to be taken during the specific semester indicated in the curriculum, but all prerequisites must be satisfied for each course. Advisement is encouraged before registration, with each student assigned a faculty advisor who remains the same for the full undergraduate program, unless the student requests a change. Students should consult with academic advisors for the availability of courses and recommended course sequences.

Program Educational Objectives

The undergraduate aerospace engineering degree program is designed to achieve the following objectives:

- Our graduates will be technically proficient and effective leaders and entrepreneurs. They will display high professional and ethical standards in aerospace engineering and related fields, and within industry, academia, and government.
- Our graduates will create new knowledge and engineering practices and develop products and services that have a global impact. They will collaborate with international partners and engage in culturally diverse teams.
- Our graduates will be life-long learners, continually developing their leadership, critical thinking, and problem-solving skills. They will be actively engaged in the acquisition and advancement of knowledge and technical expertise through research and development, and through active participation in professional societies, graduate studies, conferences, and symposia.
- Our graduates will transfer the knowledge gained from their aerospace engineering degrees to new fields that intersect with aerospace engineering such as robotics, medicine, and clean energy. They will use their degrees as a launching point for careers in other professional fields such as law, medicine, and public service.

Code	Title	Credit Hours
Wellness Requirement		
APPH 1040	Scientific Foundations of Health	2
	or APPH 10 The Science of Physical Activity and Health	
	or APPH 10 Flourishing: Strategies for Well-being and Resilience	
Core IMPACTS		
Institutional Priority		
CS 1371	Computing for Engineers	3

Mathematics and Quantitative Skills		
MATH 1552	Integral Calculus ¹	4
Political Science and U.S. History		
HIST 2111	The United States to 1877	3
	or HIST 2112 The United States since 1877	
	or INTA 1200 American Government in Comparative Perspective	
	or POL 1101 Government of the United States	
	or PUBP 3000 American Constitutional Issues	
Arts, Humanities, and Ethics		
Any HUM		6
Communicating in Writing		
ENGL 1101	English Composition I	3
ENGL 1102	English Composition II	3
Technology, Mathematics, and Sciences		
PHYS 2211	Principles of Physics I ^{1,2}	4
PHYS 2212	Principles of Physics II ^{1,3}	4
MATH 1551	Differential Calculus ¹	2
MATH 1553	Introduction to Linear Algebra ^{1,7}	2
Social Sciences		
Any SS		9
Field of Study		
MATH 2551	Multivariable Calculus ¹	4
MATH 2552	Differential Equations ¹	4
MSE 2001	Principles and Applications of Engineering Materials	3
CHEM 1310	Principles of General Chemistry for Engineers	4
AE 1601	Introduction to Aerospace Engineering ¹	1
COE 2001	Statics ¹	2
Major Requirements		
Economics Requirement ⁸		
AE 2010	Thermodynamics & Fluids Fundamentals ¹	4
AE 2220	Dynamics ¹	3
COE 3001	Mechanics of Deformable Bodies	3
AE 2610	Introduction to Experimental Methods in Aerospace	1
AE 2611	Technical Communications for Aerospace Engineers ¹	1
AE 3330	Introduction to Aerospace Vehicle Performance	3
AE 3030	Aerodynamics	4
AE 3140	Structural Analysis	3
AE 3530	System Dynamics and Vibration	3
AE 3531	Control System Analysis and Design	3
AE 3610	Experiments in Fluid and Solid Mechanics	2
AE 4311	Aircraft Design I: Conceptual Design	3
	or AE 4321 Space System Design I: Conceptual Design	
	or AE 4331 Rotorcraft Design I: Conceptual Design	
AE 4312	Aircraft Design II: Preliminary Design	3
	or AE 4322 Space System Design II: Mission Design	
	or AE 4332 Rotorcraft Design II: Preliminary Design	
AE 4531	Aircraft Flight Dynamics	3
	or AE 4532 Spacecraft Flight Dynamics	
AE 4451	Jet and Rocket Propulsion	3

AE 4610	Dynamics and Control Laboratory	2
AE Options ⁴		6
Non-AE Required Courses		
ME 1670	Introduction to Engineering Graphics and Design	3
ECE 3710	Circuits and Electronics	2
ECE 3741	Instrumentation and Electronics Lab	1
Math Option ⁵		3
Free Electives		
Free Electives ⁶		9
Total Credit Hours		131

Pass-fail only allowed for Free Electives.

¹ Minimum grade of C required.

² If PHYS 2231 (5 credit hours) is taken, excess hour applies to Free Electives.

³ If PHYS 2232 (5 credit hours) is taken, excess hour applies to Free Electives.

⁴ AE courses from list supplied by School

⁵ Math Options: MATH 3215, MATH 3670, MATH 4305, MATH 4317, MATH 4320, MATH 4347, MATH 4541, MATH 4581, MATH 4640

⁶ ME 2202, ME 3322, and PHYS 2XXX (AP credit) are not allowed.

⁷ MATH 1554 or MATH 1564 may be used in place of MATH 1553.

⁸ Engineering students must complete one of the following economics classes: ECON 2100, ECON 2101, ECON 2105, ECON 2106. The course will also satisfy 3 hours of Core IMPACTS Social Science courses.

- A grade of **C** or better is required in each 1000 and 2000 level mathematics and physics course; a course with a **D** or **F** grade must be repeated the next semester the student is in residence.
- A 2.0 or higher overall grade-point average is required to schedule COE 2001
- At the 3000-level and above, no more than two D grades are permitted in required AE (core and AE options) and required COE courses. Additional D grades must be repeated.

Cooperative Plan

The School of Aerospace Engineering offers BSAE with COOP option. Students alternate between industrial assignments and classroom studies until they complete three semesters of work. Co-op students with mechanical engineering majors complete the same coursework on campus that is completed by regular four-year students. Most co-op students begin the program as sophomores or juniors and are classified as full-time students regardless of whether they are attending classes on campus or are full-time at an employer's location. For additional information about the Georgia Tech Co-Op program, visit www.coop.gatech.edu.

International Plan

The International Plan is a challenging and coherent academic program for undergraduates emphasizing global competence within the context of the aerospace engineering major. This program has specific language requirements. There are also coursework requirements related to history, global economy, international culture, and residential foreign experience. Refer to www.internationalplan.gatech.edu for the general requirements of the International Plan. These requirements may be satisfied by

carefully selecting the humanities, social sciences, and free elective hours available in the program, in consultation with a faculty advisor.

Research Option

The school of Aerospace Engineering offers the "Research Option" under the BSAE degree program. In order to graduate with a BSAE (RO) degree, the students must

- Complete at least nine units of undergraduate research (over at least two, preferably three terms). Research may be for either pay (AE 2698 or AE 4698) or credit (AE 2699 or AE 4699). Research for credit may be used towards the BSAE free elective requirements.
- Write an undergraduate thesis/report of research on their findings. This is usually done during the graduating term.
- Take both LMC 4701 (typically taken during the first or second semester of research) and LMC 4702: (taken during the thesis-writing semester).

At least six of the nine required credit hours of research should be on the same topic. A research proposal must be approved by a faculty advisor and one other faculty member. This proposal will be written in LMC 4701 which serves as a prerequisite for LMC 4702. Completion of Research Option is noted on the student's transcript.

For additional details, please contact: permits@ae.gatech.edu

BS/MS Honors Program

A combined BS/MS honors program is also offered that prepares students for graduate studies and research. Please see <http://ae.gatech.edu/bs-ms-honors-program> for more information.