

AEROSPACE ENGINEERING

Aerospace engineers are called upon to solve exciting problems of design, construction and operation of aircraft and spacecraft to meet the ever-increasing requirement for improved performance at lower unit cost. These challenges mean that aerospace engineers work at the continuously changing forefront of science, technology and systems management.

About this Program

- **College:** Herbert Wertheim College of Engineering
- **Degree:** Bachelor of Science in Aerospace Engineering
- **Credits for Degree:** 128
- **Additional Information**
- **Related Aerospace Engineering Programs**

To graduate with this major, students must complete all university, college, and major requirements.

The undergraduate curriculum in aerospace engineering is a fully accredited baccalaureate program that provides a broad education with a strong foundation in mathematics, science and basic engineering sciences. Advanced courses in aeronautics and astronautics complete the degree. Graduates will be prepared to work in the aerospace and related industries or to pursue graduate study.

Combined Bachelor's/Master's Degree Program

The aerospace engineering professional often benefits from an advanced degree to meet the challenging needs of industry and government. Accordingly, the MAE department actively participates in the combined B.S./M.S. degree program that allows students to double-count graduate courses toward both degrees. The combined-degree program reduces the cost for both degrees and enhances the student's marketability for career advancement. Interested students should contact the Department of Mechanical and Aerospace Engineering or its website for more information.

Department Requirements

Minimum grades of C are required for EGM 2511, EGM 3401 and EML 3100. The minimum grade of C is considered part of the prerequisite requirement for courses that list EGM 2511, EGM 3401 or EML 3100 as a prerequisite. The prerequisite course and subsequent course cannot be taken in the same term, even if the prerequisite is being repeated.

An aerospace or mechanical engineering student whose cumulative, upper-division or department grade point average falls below a 2.0 or whose critical-tracking grades do not meet department requirements will be placed on academic probation and required to complete a probation contract with an MAE academic advisor. Students normally are allowed a maximum of two terms (consecutive or non-consecutive) on academic probation. Students who do not satisfy the conditions of the first term on probation may be dismissed from the department.

All graduating seniors must complete an exit interview.

Dual-Degree Programs

There is great overlap between the aerospace engineering and mechanical engineering curriculum. The first six semesters of the

two degree programs are identical. Through proper selection of electives, students can earn dual mechanical engineering/aerospace engineering B.S. degrees with one semester of additional work. Interested students should contact the Department of Mechanical and Aerospace Engineering or its website for more information.

Educational Objectives

The objective of the aerospace engineering program at UF is to prepare students to attain the following goals within a few years of graduation:

- Graduates will meet the expectations of employers of aerospace engineers.
- Qualified graduates will pursue advanced study if they so desire.

Mission

The mission of the undergraduate program is to:

- serve the state of Florida, the United States and the engineering profession by providing quality educational programs in aerospace engineering;
- conduct a nationally recognized research program; and
- foster ongoing professional development of students and faculty.

Research Programs

The department's active research programs are sponsored by private industry, the National Science Foundation, Department of Defense, NASA, National Institutes of Health and other agencies. These programs keep faculty at the leading edge of technology and provide opportunities for students to participate in research through classroom assignments, individual studies, undergraduate research scholarships and employment as research assistants.

Related Aerospace Engineering Programs

- Combined Degree
- Dual Degree in Mechanical Engineering and Aerospace Engineering
- Bachelor of Science in Mechanical Engineering
- Biomechanics minor

Critical Tracking

Critical Tracking records each student's progress in courses that are required for entry to each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites may be used for transfer students.

Semester 1

- Complete 1 of 8 tracking courses with a minimum grade of C within two attempts:
CHM 2045 or CHM 2095, approved science elective, MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048, PHY 2049
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 2

- Complete 1 additional critical-tracking course with a minimum grade of C within two attempts

- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 3

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 4

- Complete 2 additional critical-tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Semester 5

- Complete all 8 critical-tracking courses with minimum grades of C within two attempts
- 2.5 GPA required for all critical-tracking courses
- 2.0 UF GPA required

Model Semester Plan

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.

Course	Title	Credits
Semester One		
Select one:		3
CHM 2045	General Chemistry 1 (Critical Tracking ; Gen Ed Physical Sciences)	
CHM 2095	Chemistry for Engineers 1 (Critical Tracking ; Gen Ed Physical Sciences)	
CHM 2045L	General Chemistry 1 Laboratory (Gen Ed Physical Sciences)	1
EML 2920	Department and Professional Orientation	1
IUF 1000	What is the Good Life (Gen Ed Humanities)	3
MAC 2311	Analytic Geometry and Calculus 1 (Critical Tracking ; State Core Gen Ed Mathematics)	4
Gen Ed Composition; Writing Requirement: 6,000 words ^{1,2}		3
	Credits	15
Semester Two		
EML 2023	Computer Aided Graphics and Design	3
ENC 3246	Professional Communication for Engineers (State Core Gen Ed Composition; Writing Requirement: 6,000 words)	3
MAC 2312	Analytic Geometry and Calculus 2 (Critical Tracking ; Gen Ed Mathematics)	4
PHY 2048	Physics with Calculus 1 (Critical Tracking ; State Core Gen Ed Physical Sciences)	3
PHY 2048L	Laboratory for Physics with Calculus 1 (Gen Ed Physical Sciences)	1
Science elective (Critical Tracking)		3
	Credits	17

Semester Three

COP 2271	Computer Programming for Engineers (take the matlab section)	2
EAS 2011	Introduction to Aerospace Engineering	3
EGM 2511	Engineering Mechanics: Statics ³	3
MAC 2313	Analytic Geometry and Calculus 3 (Critical Tracking ; Gen Ed Mathematics)	4
PHY 2049	Physics with Calculus 2 (Critical Tracking ; Gen Ed Biological and Physical Sciences)	3
PHY 2049L	Laboratory for Physics with Calculus 2	1
	Credits	16

Semester Four

EGM 3344	Introduction to Numerical Methods of Engineering Analysis ³	3
EGM 3520	Mechanics of Materials ³	3
EMA 3010	Materials	3
EML 2322L	Design and Manufacturing Laboratory	2
EML 3100	Thermodynamics ³	3
MAP 2302	Elementary Differential Equations (Critical Tracking)	3
	Credits	17

Semester Five

EAS 4101	Aerodynamics	3
EEL 3003	Elements of Electrical Engineering ⁴	3
EGM 3401	Engineering Mechanics: Dynamics ³	3
MAP 4305	Differential Equations for Engineers and Physical Scientists	3
EML 3301C	Mechanics of Materials Laboratory (Writing Requirement: 6,000 words)	3
State Core Gen Ed Social and Behavioral Sciences ¹		3
	Credits	18

Semester Six

EAS 4132	Compressible Flow	3
EAS 4510	Astrodynamics	3
EAS 4810C	Aerospace Sciences Lab and Design	3
EML 4312	Control of Mechanical Engineering Systems	3
Select one:		3
	Gen Ed Humanities; Writing Requirement: 6,000 words ¹	
	Gen Ed Social and Behavioral Sciences; Writing Requirement: 6,000 words ¹	
	Credits	15

Semester Seven

EAS 4200C	Aerospace Structures	3
EAS 4400	Stability and Control of Aircraft	3
State Core Gen Ed Humanities ¹		3
Aerospace electives		6
	Credits	15

Semester Eight

EAS 4300	Aerospace Propulsion	3
EAS 4700	Aerospace Design 1	3
	or EAS 4710 or Aerospace Design 2	
Gen Ed Social and Behavioral Sciences		3
Technical electives		6
	Credits	15
	Total Credits	128

¹ Students are also expected to complete the Gen Ed International and Gen Ed Diversity requirements. This is often done concurrently with another general education requirement (typically, Gen Ed Composition, Gen Ed Humanities or Gen Ed Social and Behavioral Sciences).

- ² ACT/SAT placement scores do not exempt this requirement.
³ Minimum grade of C required.
⁴ Can substitute EEL 3111C.

Approved Electives

Science Elective

Critical Tracking

Code	Title	Credits
Select one of the following:		
AST 3018	Astronomy and Astrophysics 1	3
AST 3019	Astronomy and Astrophysics 2	
BSC 2010	Integrated Principles of Biology 1	
CHM 2046	General Chemistry 2	
CHM 2096	Chemistry for Engineers 2	
PHY 3101	Introduction to Modern Physics	

Aerospace Electives

Code	Title	Credits
Select two of the following:		
EAS 4240	Aerospace Structural Composites 1	6
EAS 4412	Dynamics and Control of Space Vehicles	
EML 4140	Heat Transfer	
EML 4220	Vibrations	
EML 4507	Finite Element Analysis and Design	
Any graduate-level course taught by the MAE department		

Academic Learning Compact

Aerospace engineers solve exciting problems of design, construction and operation of aircraft and spacecraft to meet the ever-increasing requirement for improved performance at lower unit cost. The undergraduate curriculum provides a broad education with a strong foundation in mathematics, science and basic engineering sciences. Advanced courses in aeronautics and astronautics complete the degree program and prepares students to work in aerospace industries or to pursue graduate study.

This program is accredited by the Engineering Accreditation Commission of ABET.

Before Graduating Students Must

- Pass an assessment by two or more faculty and/or industry practitioners of performance on a major design experience.
- Pass assessment in two courses of individual assignments targeted to each learning outcome. Assessment will be provided by the instructor according to department standards.
- Complete an exit interview in your final semester.
- Complete requirements for the baccalaureate degree, as determined by faculty.

Students in the Major Will Learn to

Student Learning Outcomes (SLOs)

Content

1. Apply knowledge of mathematics, science and engineering principles to aerospace engineering problems.
2. Design and conduct aerospace engineering experiments, analyzing and interpreting the data.

Critical Thinking

3. Design an aerospace engineering system, component or process to meet desired needs within realistic economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability constraints.

Communication

4. Communicate technical data and design information effectively in writing and in speech to other aerospace engineers.

Curriculum Map

I = Introduced; R = Reinforced; A = Assessed

Courses	SLO 1	SLO 2	SLO 3	SLO 4
EAS 4100	R		R	R
EAS 4200C	R		R	R
EAS 4300	R		R	R
EAS 4400	R		R	R
EAS 4510	R			R
EAS 4710	R	R	R	R
EGM 2511	I		I	
EGM 3344	R			
EGM 3401	R			
EGM 3520	A		R	
EGM 4313	R			
EGN 3353C	R			
EML 2023			R	R
EML 2322L	R		A	A
EML 2920				I
EML 3100	A			
EML 3301C	R	I, A		A
EML 4304C	R	A	A	A
EML 4312	A		R	
ENC 3254				R

Assessment Types

- Assignments
- Exams
- Design projects and reports
- Presentations
- Additional assessments include exit and alumni surveys