

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 (<http://catalog.ufl.edu/UGRD/colleges-schools/UGENG/>)
- **Degree:** Bachelor of Science in Aerospace Engineering
- **Credits for Degree:** 128

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

Department Information

The Department of Mechanical and Aerospace Engineering (MAE) is the largest academic program on campus by student enrollment. The Mechanical Engineering program celebrated its 100 year anniversary in 2009 and is one of the founding departments of the Herbert Wertheim College of Engineering. More than a decade after the successful merger of the mechanical and aerospace programs, MAE remains a vibrant and intellectually diverse program at both the undergraduate and graduate level.

Website (<https://mae.ufl.edu/>)

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Curriculum

- Aerospace Engineering
- Biomechanics Minor
- Combination Degrees
- Mechanical Engineering

Related Programs

- Dual Degree in Mechanical Engineering and Aerospace Engineering

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.

Combination 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 combination

B.S./M.S. degree program that allows students to double-count graduate courses toward both degrees. The combination-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, EGM 3520, EGM 3344, and EML 3100. The minimum grade of C is considered part of the prerequisite requirement for courses that list EGM 2511, EGM 3401, EGM 3520, EGM 3344, 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.

Critical Tracking

Critical Tracking records each student's progress in courses that are required for progress toward 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 (<http://www.flvc.org/cpp/displayRecord.jsp?cip=140201&track=01>) may be used for transfer students.

Semester 1

- Complete 2 of 8 critical tracking (pre-professional) courses with a minimum grade of C within two attempts:
CHM 2045 or CHM 2095, EML 2023, MAC 2311, MAC 2312, MAC 2313, MAP 2302, PHY 2048, PHY 2049
- 2.8 GPA required for all critical-tracking courses (pre-professional)
- 2.0 UF GPA required

Semester 2

- Complete 2 additional critical-tracking courses (pre-professional) with a minimum grade of C within two attempts
- 2.8 GPA required for all critical-tracking courses (pre-professional)
- 2.0 UF GPA required

SEMESTER 3

- Complete 2 additional critical-tracking courses (pre-professional) with minimum grades of C within two attempts
- EGM 2511 with minimum grade of C
- EAS 2011
- 2.8 GPA required for all critical-tracking courses (pre-professional)
- 2.0 UF GPA required

SEMESTER 4

- Complete all critical-tracking courses (pre-professional) with minimum grades of C within two attempts
- EGM 3344 with minimum grade of C
- EGM 3520 with minimum grade of C
- EML 3100 with minimum grade of C
- 2.8 GPA required for all critical-tracking courses (pre-professional)
- 2.0 UF GPA required

SEMESTER 5

- EGM 3401 with minimum grade of C
- EAS 4101

SEMESTER 6

- Complete three of the remaining EAS 3XXX/4XXX required courses

SEMESTER 7

- Complete two of the remaining EAS 3XXX/4XXX required courses

SEMESTER 8

- Complete all remaining EAS 3XXX/4XXX required courses

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		
Quest 1 (Gen Ed Humanities)		3
CHM 2045 or CHM 2095	General Chemistry 1 (Critical Tracking ; pre-professional; Gen Ed Physical Sciences) or Chemistry for Engineers 1	3
CHM 2045L	General Chemistry 1 Laboratory (Gen Ed Physical Sciences)	1
EML 2920	Department and Professional Orientation	1
ENC 1101 or ENC 1102	Expository and Argumentative Writing (Writing Requirement: 6,000 words) ^{1,2} or Argument and Persuasion	3
MAC 2311	Analytic Geometry and Calculus 1 (Critical Tracking ; pre-professional; State Core Gen Ed Mathematics)	4
Credits		15
Semester Two		
EML 2023	Computer Aided Graphics and Design (Critical Tracking ; pre-professional)	3
ENC 3246	Professional Communication for Engineers (State Core Gen Ed Composition (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext); Writing Requirement: 6,000 words)	3
MAC 2312	Analytic Geometry and Calculus 2 (Critical Tracking ; pre-professional; Gen Ed Mathematics)	4
PHY 2048 & 2048L	Physics with Calculus 1 and Laboratory for Physics with Calculus 1 (Critical Tracking ; pre-professional; State Core Gen Ed Physical Sciences)	4
Approved Science elective		3
Credits		17
Semester Three		
COP 2271	Computer Programming for Engineers (take the matlab section)	2
EAS 2011	Introduction to Aerospace Engineering (Critical Tracking)	3
EGM 2511	Engineering Mechanics: Statics (Critical Tracking) ³	3
MAC 2313	Analytic Geometry and Calculus 3 (Critical Tracking ; pre-professional; Gen Ed Mathematics)	4
PHY 2049 & 2049L	Physics with Calculus 2 and Laboratory for Physics with Calculus 2 (Critical Tracking ; pre-professional; Gen Ed Biological and Physical Sciences)	4
Credits		16

Semester Four

Quest 2 (Gen Ed Social and Behavioral Sciences)	3
EGM 3344 Introduction to Numerical Methods of Engineering Analysis (Critical Tracking) ³	3
EGM 3520 Mechanics of Materials (Critical Tracking) ³	3
EML 2322L Design and Manufacturing Laboratory	2
EML 3100 Thermodynamics (Critical Tracking) ³	3
MAP 2302 Elementary Differential Equations (Critical Tracking ; pre-professional)	3
Credits	17

Semester Five

EAS 4101 Aerodynamics (Critical Tracking)	3
EEL 3003 Elements of Electrical Engineering ⁴	3
EGM 3401 Engineering Mechanics: Dynamics (Critical Tracking) ³	3
EMA 3010 Materials	3
EML 3301C Mechanics of Materials Laboratory (Writing Requirement: 6,000 words)	3
MAP 4305 Differential Equations for Engineers and Physical Scientists	3
Credits	18

Semester Six

EAS 4132 Compressible Flow (Critical Tracking)	3
EAS 4510 Astrodynamics (Critical Tracking)	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	
Approved Aerospace elective	3
Credits	15

Semester Seven

EAS 4200 Aerospace Structures (Critical Tracking)	3
EAS 4400 Stability and Control of Aircraft (Critical Tracking)	3
EAS 4810C Aerospace Sciences Lab and Design (Critical Tracking)	3
State Core Gen Ed Humanities (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext) ¹	3
Approved Aerospace elective	3
Credits	15

Semester Eight

EAS 4300 Aerospace Propulsion (Critical Tracking)	3
EAS 4700 Aerospace Design 1 (Critical Tracking) or EAS 4710 or Aerospace Design 2	3
State Core Gen Ed Social and Behavioral Sciences (http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext) ¹	3
Approved 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 | Select One****Critical Tracking**

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

Aerospace Electives | Select Two

Code	Title	Credits
EAS 4240	Aerospace Composites	3
EAS 4412	Dynamics and Control of Space Vehicles	3
EML 4140	Heat Transfer	3
EML 4220	Vibrations	3
EML 4507	Finite Element Analysis and Design	3
Any graduate-level course taught by the MAE department		3

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.

Accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org> (https://urldefense.proofpoint.com/v2/url/?u=http-3A__www.abet.org&d=DwMGaQ&c=pZJPUDQ3SB9JpIYbifm4nt2IEVG5pWx2hBf73BYn6kEY-D7Qfs6kPA&m=-KF2G1JwsXcME70kGBMIRYTy2i4YUqEwzRran98WV1M&s=73PhSd8hcuNu3AXIyLst)

ABET EAC Program Educational Objectives, Student Outcomes, and Enrollment and Graduation Numbers can be found on the college website (<https://www.eng.ufl.edu/academics/degree-programs/accreditation/>).

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
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