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)

**CONTACT**
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GAINESVILLE FL 32611-6250
Map (http://campusmap.ufl.edu/#/index/0183)

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 1 of 8 tracking 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
- 2.0 UF GPA required

**SEMESTER 2**
- Complete 1 additional critical-tracking course with a minimum grade of C within two attempts
- 2.8 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
- EGM 2511 with minimum grade of C
- EAS 2011
- 2.8 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
- 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
- 2.0 UF GPA required

**SEMESTER 5**
- Complete all critical-tracking courses with minimum grades of C within two attempts
- EGM 3401 with minimum grade of C
- EAS 4101
- 2.8 GPA required for all critical-tracking courses
- 2.0 UF GPA required

**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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>CHM 2045 or CHM 2095</td>
<td>General Chemistry 1 (Critical Tracking; Gen Ed Physical Sciences) or Chemistry for Engineers 1</td>
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<tr>
<td>CHM 2045L</td>
<td>General Chemistry 1 Laboratory (Gen Ed Physical Sciences)</td>
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<td>EML 2920</td>
<td>Department and Professional Orientation</td>
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<td>MAC 2311</td>
<td>Analytic Geometry and Calculus 1 (Critical Tracking; State Core Gen Ed Mathematics)</td>
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<tr>
<td>Quest 1</td>
<td>(Gen Ed Humanities)</td>
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<tr>
<td>Gen Ed Composition; Writing Requirement: 6,000 words</td>
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</table>

| 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 (Critical Tracking) | 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       |

| Semester Four   | EGM 3344 | Engineering Analysis (Critical Tracking) | 3       |

Credits

16

Credits

17

Credits

1

Credits

3

Credits

3

Credits

3

Credits

3

Credits

3

Credits

3

Credits

3

Credits
Approved Electives

**Science Elective | Select One**

<table>
<thead>
<tr>
<th>Code</th>
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<tr>
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<td>AST 3019</td>
<td>Astronomy and Astrophysics 2</td>
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<td>BSC 2010</td>
<td>Integrated Principles of Biology 1</td>
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<td>CHM 2046</td>
<td>General Chemistry 2</td>
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<tr>
<td>CHM 2096</td>
<td>Chemistry for Engineers 2</td>
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<tr>
<td>PHY 3101</td>
<td>Introduction to Modern Physics</td>
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**Aerospace Electives | Select Two**

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<tr>
<td>EAS 4240</td>
<td>Aerospace Composites</td>
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<tr>
<td>EAS 4412</td>
<td>Dynamics and Control of Space Vehicles</td>
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<tr>
<td>EML 4140</td>
<td>Heat Transfer</td>
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<tr>
<td>EML 4220</td>
<td>Vibrations</td>
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<tr>
<td>EML 4507</td>
<td>Finite Element Analysis and Design</td>
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Any graduate-level course taught by the MAE department is also acceptable for the Elective.

### 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.


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

<table>
<thead>
<tr>
<th>Courses</th>
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Assessment Types
• Assignments
• Exams
• Design projects and reports
• Presentations
• Additional assessments include exit and alumni surveys