Aerospace Engineering Major

Program Objectives
1. Our graduates will be successful in their professional careers, including industry, government service, and academia, in the State of Maryland and beyond.
2. Our graduates will contribute to the creation of useful new products, or the generation of original research, by analyzing and implementing solutions to relevant problems in the component disciplines of Aerospace Engineering.
3. Our graduates will contribute effectively when part of an integrated team, clearly communicating with team members, supervisors, and clients.
4. Our graduates will understand the societal context in which their profession is practiced, and will successfully adapt to future developments in both technology and the employment market.

Program Learning Outcomes
As a result of completing our undergraduate program, our students should have developed the following skills:

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.

Requirements
A minimum of 124 credits are required for an Aerospace Engineering degree:

Freshman Year
First Semester
ENES100 3
ENAE100 1
CHEM135 3
MATH140 3
General Education Program Requirements 3

Second Semester
MATH141 4
PHYS161 3
ENES102 3
ENAE202 3
General Education Program Requirements 3

Sophomore Year
First Semester
ENES220 3
ENAE283 3
MATH241 4
PHYS250 4
PHYS261 3
General Education Program Requirements 3

Second Semester
ENAE200 1
ENAES22 3
MATH246 3
PHYS461 4
PHYS271 4
General Education Program Requirements 3

Junior Year
First Semester
ENAE301 3
ENAE362 3

Second Semester
ENAE324 4
ENAE432 3

Program Director Student Services: Aileen Hentz, Ph.D.

ENAE380  General Education Program Requirements  3  3

General Education Program Requirements  3  3

ENAE414 or ENAE 311  3 ENAE311 or ENAE 404  3

Senior Year

First Semester  Credits  Second Semester  Credits
ENAE423  General Education Program Requirements  3  ENAE464  3  3

Complete all 3 courses from one of the following tracks:

AERONAUTICAL TRACK  3

ENAE403  ENAE482  (AERONAUTICAL TRACK)  3

ENAE455  ENAE484  (ASTRONAUTICAL TRACK)  3

ENAE481  General Education Program Requirements/ Elective  2-3  3

ASTRONAUTICAL TRACK
ENAE441
ENAE457
ENAE483

Total Credits 124-126

1 Can be taken first or second semester
2 Select ENAE414 for Aeronautical Track, or ENAE311 for Astronautical Track.
3 Select ENAE311 for Aeronautical Track, or ENAE404 for Astronautical Track.
4 Only ENAE398H, or an approved 400 level ENAE course not required for the student’s specific track, may be used for this elective.
5 One 300/400 level course in Engineering, Mathematics, or Physical Sciences that has been approved for this purpose by the Undergraduate Program Director.
6 Select ENAE482 for Aeronautical Track, or ENAE484 for Astronautical Track.
7 Students may take an additional General Education or elective course to help bring them to the 124 credit minimum required to graduate.

Minimum Degree Requirements

The fulfillment of all department, school, and university requirements. A minimum of 124 credits are required for an Aerospace Engineering degree.

Students must select a track. All courses in either the Aeronautical or Astronautical track must be completed. Students in either track who wish to gain a broader education across the aeronautical or space application areas can take courses required in the other track as electives.

Academic Benchmarks

Students pursuing the major should review the academic benchmarks established for this program. See: www.4yearplans.umd.edu (http://www.4yearplans.umd.edu). Students will be periodically reviewed to insure they are meeting benchmarks and progressing to the degree. Students who fall behind program benchmarks are subject to special advising requirements and other interventions.

Aerospace Electives

The department offers a range of electives. The following courses have recently been offered as electives for the undergraduate degree:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENAE398</td>
<td>Honors Research Project (ENAE398H - Honors Research)</td>
<td>1-3</td>
</tr>
<tr>
<td>ENAE415</td>
<td>Helicopter Theory</td>
<td>3</td>
</tr>
<tr>
<td>ENAE425</td>
<td>Mechanics of Composite Structures</td>
<td>3</td>
</tr>
<tr>
<td>ENAE471</td>
<td>Aircraft Flight Testing</td>
<td>3</td>
</tr>
<tr>
<td>ENAE488</td>
<td>Topics in Aerospace Engineering (ENAE488B - Intro to Computational Structural Dynamics)</td>
<td>3</td>
</tr>
<tr>
<td>ENAE488</td>
<td>Topics in Aerospace Engineering (ENAE488M - High Speed Aerodynamics)</td>
<td>3</td>
</tr>
<tr>
<td>ENAE488</td>
<td>Topics in Aerospace Engineering (ENAE488P - Product Design)</td>
<td>3</td>
</tr>
<tr>
<td>ENAE488</td>
<td>Topics in Aerospace Engineering (ENAE488R - Hybrid Rocket Design)</td>
<td>3</td>
</tr>
<tr>
<td>ENAE488</td>
<td>Topics in Aerospace Engineering (ENAE488W - Design of Remotely Piloted Vehicles)</td>
<td>3</td>
</tr>
<tr>
<td>ENAE499</td>
<td>Elective Research</td>
<td>1-3</td>
</tr>
</tbody>
</table>

1 Repeatable to 6 credits

Other Requirements for the Major

See https://courseleaf.umd.edu/undergraduate/colleges-schools/engineering/ (https://academiccatalog.umd.edu/undergraduate/colleges-schools/engineering/) for minimum grade requirements in key prerequisite courses for engineering students. Students should follow the sequence of courses as outlined in the aerospace engineering degree requirements and four-year plan.

Four Year Plan

Click here (https://eng.umd.edu/advising/four-year-plans/) for roadmaps for four-year plans in the A. James Clark School of Engineering.

Additional information on developing a four-year academic plan can be found on the following pages:

- 4yearplans.umd.edu (http://4yearplans.umd.edu/)
- the Student Academic Success-Degree Completion Policy (https://academiccatalog.umd.edu/undergraduate/registration-academic-requirements-regulations/academic-advising/) section of this catalog