Aerospace Engineering (Astronautics), BSE

ESAEASBSE

Program Description

The BSE program in aerospace engineering provides students with an education in technological areas critical to the design and development of aerospace vehicles and systems.

The astronautics concentration curriculum covers:

- attitude determination and control
- elective topics in aeronautics
- gas dynamics
- orbital mechanics
- rocket propulsion
- space environment
- space structures
- telecommunications

Students in the astronautics concentration culminate their major study with a capstone design project that incorporates the multiple disciplines involved in the creation of a space-going vehicle.

Students in the aerospace engineering program are expected to attain the following outcomes:

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


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At a Glance

- **College/School:** Ira A. Fulton Schools of Engineering
- **Location:** Tempe

- **Additional Program Fee:** Yes
- **Second Language Requirement:** No
- **First Required Math Course:** MAT 265 - Calculus for Engineers I
- **Math Intensity:** Substantial

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Required Courses (Major Map)

2023 - 2024 Major Map
Major Map (Archives)

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Concurrent Program Options

Students pursuing concurrent degrees (also known as a "double major") earn two distinct degrees and receive two diplomas. Working with their academic advisors, students can create their own concurrent degree combination. Some combinations are not possible due to high levels of overlap in curriculum.

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Accelerated Program Options

This program allows students to obtain both a bachelor's and master's degree in as little as five years. It is offered as an accelerated bachelor's plus master's degree with:

- Aerospace Engineering, MS
- Mechanical Engineering, MS
- Robotics and Autonomous Systems (Mechanical and Aerospace Engineering), MS

Acceptance to the graduate program requires a separate application. Students typically receive approval to pursue the accelerated masterâs during the junior year of their bachelor's degree program. Interested students can learn about eligibility requirements and how to apply.
Admission Requirements

General University Admission Requirements:
All students are required to meet general university admission requirements.

First-year | Transfer | International | Readmission

Additional Requirements:

The admission standards for majors in the Ira A. Fulton Schools of Engineering, shown below, are higher than minimum university admission standards. International students must meet the same admission standards, with the possible additional requirement of a minimum English language proficiency test score. If the university requires an English proficiency test score from the applicant, then admission to engineering requires a minimum TOEFL iBT score of 79 (internet-based test, taken in a testing center), a minimum IELTS score of 6.5, a minimum PTE score of 58, or a minimum Duolingo English score of 105.

First-year admission:

1. minimum 1210 SAT combined evidence-based reading and writing plus math score or minimum 24 ACT combined score, or a minimum high school cumulative GPA of 3.00 in ASU competency courses, or class ranking in top 25% of high school class, and
2. no high school math or science competency deficiencies

Transfer Admission Requirements:

Transfer students with fewer than 24 transferable college credit hours:

1. minimum transfer GPA of 3.00 for fewer than 24 transfer hours, and
2. no high school math or science competency deficiencies, and
3. minimum 1210 SAT combined evidence-based reading and writing plus math score (or 1140 if taken prior to March 5, 2016) or minimum 24 ACT combined score, or a minimum high school cumulative GPA of 3.00 in ASU competency courses, or class ranking in top 25% of high school class

Transfer students with 24 or more transferable college credit hours must meet EITHER the primary or the secondary criteria (not both):

Primary criteria

1. minimum transfer GPA of 3.00 for 24 or more transfer hours, and
2. no high school math or science competency deficiencies (if ASU Admission Services requires submission of a high school transcript)

Secondary criteria

1. minimum transfer GPA of 2.75 for 24 or more transfer credit hours, and

**Tuition Information**

When it comes to paying for college, everyone’s situation is different. Students can learn about ASU tuition and financial aid options to find out which will work best for them.

**Change of Major Requirements**

[Admission requirements](#) for many majors in the Ira A. Fulton Schools of Engineering are higher than university admission standards.

Students should visit the [Change of Major form](#) for information about how to change a major to this program.

**Transfer Options**

ASU is committed to helping students thrive by offering tools that allow personalization of the transfer path to ASU. Students may use [MyPath2ASU®](#) to outline a list of recommended courses to take prior to transfer.

ASU has [transfer partnerships](#) in Arizona and across the country to create a simplified transfer experience for students. These pathway programs include exclusive benefits, tools and resources, and they help students save time and money in their college journey.

**Program Learning Outcomes**

Program learning outcomes identify what a student will learn or be able to do upon completion of their program. This program has the following program outcomes:

- Apply principles of mathematics and science to solve complex engineering problems (ABET Outcome)
- Apply engineering design to a student project with consideration of public welfare/other factors (ABET Outcome)
- Develop and conduct engineering experiments, and analyze and interpret data (ABET Outcome).

**Global Opportunities**

Global Experience
With over 300 programs in more than 65 countries (programs vary in duration, from one week to one year), participation in Global Education programs is possible for all ASU students. Study abroad helps students gain a global perspective and knowledge, preparing them for leading in a forward-thinking career. Students earn ASU credit for completed courses, while staying on track for graduation, and they may apply financial aid and scholarships toward program costs.

The Ira A. Fulton Schools of Engineering recommends these programs for students majoring in aerospace engineering.

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### Career Opportunities

The majority of students entering the field of aerospace engineering desire to work on the design and analysis of aerospace vehicles. Most graduates are employed in the aerospace industry or in government positions related to aerospace. Specific careers in aerospace engineering include:

- aeronautical and space systems integration
- configuration development
- material and structural design
- propulsion engineering
- space mission design and analysis
- vehicle and component analysis using computer-aided tools
- vehicle design and performance
- wind tunnel and flight testing

The aerospace engineering program has the following educational objectives:

Through volunteering, entrepreneurial endeavors, community service, their employment, etc., graduates of the aerospace engineering program demonstrate commitment to the Sun Devil ideals of global engagement, social embeddedness, social transformation and sustainability.

Graduates of the aerospace engineering program should have attained one or more of the following objectives within a few years after completing their degrees:

- employment in aerospace or other field in a position that capitalizes on the skills and abilities gained through the degree in aerospace engineering, in positions of increasing responsibility and leadership within their organization
- admission into a graduate degree program in aerospace engineering or other technical field
- admission into a professional degree program, such as law or business, in accordance with the specific interests and abilities of the graduate

Career example titles and salaries listed below are not necessarily entry level, and students should take into consideration how years of experience, geographical location, and required advanced degrees or certifications may affect pay scales.
<table>
<thead>
<tr>
<th>Career</th>
<th>*Growth</th>
<th>*Median Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace Engineer 🌟</td>
<td>6.1%</td>
<td>$126,880</td>
</tr>
<tr>
<td>Energy Engineer</td>
<td>3.3%</td>
<td>$104,600</td>
</tr>
<tr>
<td>Engineering Manager</td>
<td>4.1%</td>
<td>$159,920</td>
</tr>
</tbody>
</table>

* Data obtained from the Occupational Information Network (O*NET) under sponsorship of the U.S. Department of Labor/Employment and Training Administration (USDOL/ETA).

🌟 Bright Outlook

**Professional Licensure**

ASU programs that may lead to professional licensure or certification are intended to prepare students for potential licensure or certification in Arizona. Completion of an ASU program may not meet educational requirements for licensure or certification in another state. For more information, students should visit the [ASU professional licensure](#) webpage.

**Contact Information**

[Mechanical and Aerospace Engineering Program](#) | ECG 202
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