Mechanical Engineering (Energy and Environment), BSE

Program Description

The concentration in energy and environment within the BSE program in mechanical engineering is designed to prepare students to analyze technical problems in:

- air pollution
- climate change
- energy efficiency
- environmental sustainability
- renewable energy
- timely issues facing the global community

Although the primary focus of this program is technical, the general education courses in the areas of the humanities and social and behavioral sciences introduce students to the global, political and societal issues relating to energy and the environment.

By focusing on issues such as air pollution, water scarcity and the lack of alternative transportation, this program is even more attractive for employers in the greater Phoenix area as well as nationwide.


At a Glance

- **College/School:** [Ira A. Fulton Schools of Engineering](http://www.asu.edu)
- **Location:** Tempe

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

### Required Courses (Major Map)

- **2022 - 2023 Major Map**
- **Major Map (Archives)**

### 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.

### 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 and master's degree with:**

- **Aerospace Engineering, MS**
- **Materials Science and Engineering, MS**
- **Mechanical Engineering, MS**
- **Modern Energy Production and Sustainable Use, MS**
- **Solar Energy Engineering and Commercialization, PSM**

Acceptance to the graduate program requires a separate application. During their junior year, eligible students are advised by their academic departments 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 are higher than minimum university admission standards. International students may have an additional English language proficiency criterion. Foreign nationals must meet the same admission requirements shown below with the possible additional requirement of a minimum TOEFL score. If the university requires a TOEFL score
from the applicant (https://admission.asu.edu/international/undergrad-student), then admission to engineering requires a minimum TOEFL score of 550 (paper-based), 213 (computer-based), 79 on iBT (internet-based) or a minimum IELTS score of 6.5.

**Freshman Admission:**

1. minimum 1210 SAT combined evidence-based reading and writing plus math score or minimum 24 ACT combined score or 3.00 minimum ABOR GPA 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 less 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 and math score (or 1140 if taken prior to March 5, 2016) or minimum 24 ACT combined score, or 3.00 minimum ABOR GPA, 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 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
2. minimum GPA of 2.75 in all critical courses: MAE 201, MAE 202, MAE 213 and MAE 241.

**Change of Major Requirements**

Admission requirements for many majors in the Ira A. Fulton Schools of Engineering are higher than university admission standards. https://engineering.asu.edu/admission-requirements

Students should refer to https://changemajor.apps.asu.edu 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. Students may learn more about these programs by visiting the admission site: https://admission.asu.edu/transfer/MyPath2ASU.

Global Opportunities

Global Experience
Students gain valuable experience when studying abroad, experience that can enhance their resumes. With over 250 programs available, study abroad allows students to tailor their experience to their unique interests and skill sets. Students focusing on energy and the environment are able to gain hands-on experience in a variety of countries around the world. In a competitive field, students stand out with the heightened cultural competency and leadership and critical thinking skills they acquired through their study abroad opportunity. https://goglobal.asu.edu/

Career Opportunities

Mechanical engineers are employed in virtually every kind of industry. They are involved in generating creative design and development; seeking new knowledge through research; and the production, control, management and sales of the devices and systems needed by society. Therefore, a major strength of a mechanical engineering education is the flexibility it provides in future employment opportunities for its graduates. Students completing this concentration have opportunities as environmental consultants; heating, ventilation and air-conditioning engineers; and power plant designers.

The mechanical engineering program has the following program educational objectives:

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

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

• employment in engineering or other fields in a position that capitalizes on the skills and abilities gained through the degree program in mechanical engineering (holding positions of increasing responsibility and leadership within their organizations)
• admission into a graduate degree program in mechanical engineering or other technical field
• admission into a professional degree program, such as law, business or medicine, in accordance
  with the specific interests and abilities of the graduate

Graduates of the mechanical engineering program are expected to attain the following outcomes:

• an ability to identify, formulate and solve complex engineering problems by applying principles of
  engineering, science and mathematics
• 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
• an ability to communicate effectively with a range of audiences
• 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
• 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
• an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use
  engineering judgment to draw conclusions
• an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Career examples include but are not limited to those shown in the following list. Advanced degrees or
certifications may be required for academic or clinical positions.

<table>
<thead>
<tr>
<th>Career</th>
<th>*Growth</th>
<th>*Median Salary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive Engineer ✨</td>
<td>3.9%</td>
<td>$90,160</td>
</tr>
<tr>
<td>Biomedical Engineer ✨</td>
<td>4.7%</td>
<td>$92,620</td>
</tr>
<tr>
<td>Energy Engineer ✨</td>
<td>1.3%</td>
<td>$103,380</td>
</tr>
<tr>
<td>Engineering Manager ✨</td>
<td>2.6%</td>
<td>$149,530</td>
</tr>
<tr>
<td>Environmental Engineer ✨</td>
<td>3.1%</td>
<td>$92,120</td>
</tr>
<tr>
<td>Mechanical Engineer ✨</td>
<td>3.9%</td>
<td>$90,160</td>
</tr>
<tr>
<td>Power Plant Manager ✨</td>
<td>0.9%</td>
<td>$108,790</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  ✨ Green Occupation

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: [https://admission.asu.edu/academics/licensure](https://admission.asu.edu/academics/licensure).

Students should note that not all programs within the Fulton Schools of Engineering lead to professional licensure.

**Contact Information**

[Mechanical and Aerospace Engineering Program](mailto:semte@asu.edu) | ECG 202 | 480-965-2335