Software Engineering, BS

TSSERBS

Software engineers solve a broad set of interdisciplinary problems and apply new technologies, to improve the quality of life.

Program Description

The BS program in software engineering blends engineering, computing, project leadership and software construction.

Students learn how to make creative software solutions to today's problems. Software systems are complex, often including millions of lines of code. Graduates of the bachelor's degree program in software engineering possess the knowledge and skills of a defined engineering approach to complex systems analysis, planning, design and construction.

The program has a unique, project-driven curriculum, establishing a new model for software engineering education. The program is built around the concepts of engaged learning, discovery-based education and learn-by-doing. Students learn by solving engaging projects, commonly as a member of a development team. In every semester of the program, students complete projects that provide emphasis in communication, teamwork, critical thinking and professionalism. They have flexibility in designing their course of study, selecting technical electives from a pool of courses in different software engineering application areas such as web and mobile applications, embedded systems and other interdisciplinary areas.


This major is eligible for the Western Undergraduate Exchange program at the following location: Polytechnic campus. Students from Western states who select this major and campus may be eligible for reduced nonresident tuition at a rate of 150% of Arizona resident tuition plus all applicable fees. Students should click the link for more information and eligibility requirements of the [WUE program](http://www.abet.org).
At a Glance

- **College/School:** Ira A. Fulton Schools of Engineering
- **Location:** Polytechnic WUE or Online, ASU Local
- **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)

2023 - 2024 Major Map (On-campus)
2023 - 2024 Major Map (Online)
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 plus master's degree with:

- **Computer Science (Big Data Systems), MCS**
- **Computer Science (Cybersecurity), MCS**
- **Computer Science, MCS**
- **Robotics and Autonomous Systems (Artificial Intelligence), MS**
- **Software Engineering, MS**

Acceptance to the graduate program requires a separate application. Students typically receive approval to pursue the accelerated master's 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. Admission may be granted with one deficiency in no more than two [competency areas](#). Deficiencies in both math and laboratory science are not acceptable.

**Transfer Admission Requirements:**

**Transfer students with fewer than 24 transferable college credit hours:**

1. minimum transfer GPA of 2.75 for fewer than 24 transfer hours, and
2. meet the first-year admission requirements

**Transfer students with more than 24 transferable college credit hours:**

1. Minimum transfer GPA of 2.75 for 24 or more transfer hours, and
2. If ASU Admission Services requires submission of a high school transcript, admission may be granted with one deficiency in no more than two [competency areas](#). Deficiencies in both math and laboratory science are not acceptable.

**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.

**Attend Online**

**ASU Online**

ASU offers this program in an online format with multiple enrollment sessions throughout the year. Applicants may view the program’s ASU Online page for program descriptions and to request more information.

**ASU Local**

It is now possible to earn an ASU degree with ASU Local, an integrated college experience in which students take advantage of in-person success coaching and programming experiences on site while completing one of 130+ undergraduate online degree programs, all of which come with online faculty interaction and tutoring support.

**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:

- Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (ABET 1)
- 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. (ABET 2)
- Use the techniques, skills, and modern engineering tools and processes necessary for software engineering practice. (ABET-SER1)

**Global Opportunities**

Global Experience
Students in software engineering gain valuable hands-on experience when studying abroad, experience which enhances their resumes. With more than 300 programs available in a variety of countries around the world, study abroad allows students to tailor their experience to their unique interests and skill sets. In a competitive field, students stand out with the heightened cultural competency and the leadership and critical thinking skills they achieved when studying abroad. More information on available programs can be found on the Global Education website.

Career Opportunities

Software engineers solve a broad set of transdisciplinary problems and apply new technologies to improve the quality of life.

Graduates are prepared for advanced study in computing or an allied field or to enter the computing profession, most commonly as application software engineers. They design and engineer innovative systems that may include mechanical and electrical components that interact with software.

According to the Bureau of Labor Statistics, software engineers are highly paid, and there is significant growth in the number of employment opportunities. Some software engineering jobs may include:

- creating applications for mobile devices
- creating web applications
- designing, creating and validating software for avionics, robotics and similar systems fields

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>Computer Programmer</td>
<td></td>
<td>$97,800</td>
</tr>
<tr>
<td>Computer Science Professor</td>
<td>5.3%</td>
<td>$84,760</td>
</tr>
<tr>
<td>Computer Software Quality Engineer (*)</td>
<td>20.3%</td>
<td>$99,620</td>
</tr>
<tr>
<td>Information Technology Manager (IT Manager) (*)</td>
<td>15.4%</td>
<td>$164,070</td>
</tr>
<tr>
<td>Software Developer (*)</td>
<td>25.7%</td>
<td>$127,260</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).

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Contact Information