BACHELOR OF SCIENCE IN COMPUTER SCIENCE

Goals and Objectives for the B.S. in Computer Science

Goal 1: Graduates succeed as practicing computer scientists.

Students will be able to:

Objective 1.1: Solve problems and implement their solutions in an appropriate computational environment.

Objective 1.2: Apply their knowledge of computer science, mathematics, and science to solve technical problems.

Objective 1.3: Design systems, components, or processes to meet specified requirements.

Objective 1.4: Work in teams to create various software systems, both large and small.

Objective 1.5: Communicate effectively, orally and in written form, individually and/or in teams.

Goal 2: Graduates adapt and evolve in complex technological environments such as those found in the workplace.

Students will be able to:

Objective 2.1: Solve problems and implement their solutions in an appropriate computational environment.

Objective 2.2: Apply their knowledge of computer science, mathematics, and science to solve technical problems.

Objective 2.3: Design systems, components, or processes to meet specified requirements.

Objective 2.4: Work in teams to create various software systems, both large and small.

Objective 2.5: Analyze contemporary issues related to the evolving discipline of computer science.

Objective 2.6: Communicate effectively, orally and in written form, individually and/or in teams.

Goal 3: To provide graduates with a firm foundation in the scientific and mathematical principles that support the computing discipline.

Students will be able to:

Objective 3.1: Solve problems and implement their solutions in an appropriate computational environment.

Objective 3.2: Apply their knowledge of computer science, mathematics, and science to solve technical problems.

Objective 3.3: Design systems, components, or processes to meet specified requirements.

Goal 4: Graduates are careful, precise, mature thinkers, and take with them, the intellectual preparation they need to apply what they have learned, communicate it to others, and continue their education for the rest of their lives.

Students will be able to:

Objective 4.1: Enter and succeed in graduate programs in computing.

Objective 4.2: Solve problems and implement their solutions in an appropriate computational environment.

Objective 4.3: Apply their knowledge of computer science, mathematics, and science to solve technical problems.

Objective 4.4: Design systems, components, or processes to meet specified requirements.

Objective 4.5: Articulate the social, professional, ethical and legal aspects of a computing environment.

Objective 4.6: Analyze contemporary issues related to the evolving discipline of computer science.

Objective 4.7: Communicate effectively, orally and in written form, individually and/or in teams.

Requirements for the Computer Science Major

The traditional undergraduate programs include 40 courses distributed across three components: A General Education component divided into Signature Courses, Variable Courses, and an Integrative Learning requirement; a Major and Divisional component; and Free Electives. In addition to course requirements as specified in each area, students must complete one certified course in each of the following overlay areas:

1. Diversity, Globalization or Non-western Area Studies,
2. Ethics Intensive, and
3. Writing Intensive. Overlay requirements are part of the forty-course requirement.

General Education Signature Courses

See this page about Signature courses (https://academiccatalog.sju.edu/curricula/#signature). Six courses

General Education Variable Courses

See this page about Variable courses (https://academiccatalog.sju.edu/curricula/#variable). Six to Nine courses

<table>
<thead>
<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>MAT 155</td>
<td>Fundamentals of Calculus</td>
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<tr>
<td>or MAT 161</td>
<td>Calculus I</td>
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Natural Science

One semester of any lab-based natural science course (see ILC)

1 A total of thirty semester hours of science and mathematics courses are required with at least fifteen semester hours of mathematics (other than pre-calculus).

General Education Overlays

See this page about Overlays (https://academiccatalog.sju.edu/curricula/#overlay).
**General Education Integrative Learning Component**

See this page about Integrative Learning Component (https://academiccatalog.sju.edu/curricula/#integrative-learning). Three courses

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<tbody>
<tr>
<td>MAT 156</td>
<td>Applied Calculus II</td>
<td>3</td>
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<tr>
<td>or MAT 162</td>
<td>Calculus II</td>
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Select one of the following:

- One additional Mathematics course numbered 213 or higher
- LIN 200 Introduction to Linguistics

**Natural Science**

Select one additional lab-based natural science course (see GEP Variable Courses)

1 A total of thirty semester hours of science and mathematics courses are required with at least fifteen semester hours of mathematics (other than pre-calculus).

**GEP Electives**

Six courses

**Major Requirements**

**Major Concentration**

Fifteen courses including

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<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>CSC 120</td>
<td>Computer Science I</td>
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<td>CSC 121</td>
<td>Computer Science II</td>
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<td>CSC 240</td>
<td>Discrete Structures I</td>
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<tr>
<td>CSC 241</td>
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<td>CSC 201</td>
<td>Data Structures</td>
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<td>CSC 202</td>
<td>Computer Architecture</td>
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<td>CSC 261</td>
<td>Principles of Programming Lang</td>
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<tr>
<td>CSC 281</td>
<td>Design &amp; Analysis Algorithms</td>
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<td>CSC 310</td>
<td>Computer Systems</td>
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<tr>
<td>CSC 315</td>
<td>Software Engineering</td>
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<tr>
<td>CSC 495</td>
<td>Computer Science Project</td>
<td>3</td>
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</table>

Electives

Select four including any CSC courses numbered 340 or above

**Double Major in Computer Science**

**Advisor**

- Dr. Wei

With the approval of the Department, students who wish to double major in Computer Science and another discipline shall first satisfy the Major’s requirement of the Nine Required Core Courses and then take an additional CSC elective course.