COMPUTER SCIENCE MAJOR

Program Overview
The program prepares students both for a professional career in the field of computing or for graduate study, if that is the student’s inclination.

Learning Goals and Objectives

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.

Objective 2.7: 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>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 155</td>
<td>Fundamentals of Calculus</td>
<td>3</td>
</tr>
<tr>
<td>or MAT 161</td>
<td>Calculus I</td>
<td></td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 120 &amp; MAT 155</td>
<td>The Mathematics of Modeling and Fundamentals of Calculus</td>
<td>6</td>
</tr>
<tr>
<td>MAT 155 &amp; MAT 156</td>
<td>Fundamentals of Calculus and Applied Calculus II</td>
<td>6</td>
</tr>
<tr>
<td>MAT 161 &amp; MAT 162</td>
<td>Calculus I and Calculus II</td>
<td>8</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 118</td>
<td>Introduction to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>or MAT 128</td>
<td>Applied Statistics</td>
<td></td>
</tr>
</tbody>
</table>

GEP Electives

Seven courses

Major Requirements

Major Concentration

Fifteen courses including

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science</td>
<td>Computer Science I</td>
<td>4</td>
</tr>
<tr>
<td>CSC 120</td>
<td>Computer Science II</td>
<td>4</td>
</tr>
<tr>
<td>CSC 240</td>
<td>Discrete Structures</td>
<td>3</td>
</tr>
<tr>
<td>CSC 201</td>
<td>Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>CSC 202</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>CSC 261</td>
<td>Principles of Programming Lang</td>
<td>3</td>
</tr>
<tr>
<td>CSC 281</td>
<td>Design &amp; Analysis Algorithms</td>
<td>3</td>
</tr>
<tr>
<td>CSC 310</td>
<td>Computer Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSC 315</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CSC 495</td>
<td>Computer Science Project</td>
<td>3</td>
</tr>
</tbody>
</table>

Electives

Select five including any CSC courses numbered 340 or above

Double Major in Computer Science

Advisor

• Dr. Forouraghi

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.