COMPUTER SCIENCE

The Computer Science Program is designed for students who are developing computer programming skills in preparation to transfer to a four-year college or university. These courses meet the needs of students at various levels of competence, from the novice to the expert by fostering the student’s ability to solve computer science problems. This program presents the latest methods of computer science that are implemented in solving problems of science, industry and government while also preparing students for additional formal education in this rapidly changing field. The program offers the Associate Degree for Transfer in Computer Science and the Certificate of Achievement in Gaming and Applications Development.

Faculty

<table>
<thead>
<tr>
<th>Name</th>
<th>Office Room Number</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solis, Roberto</td>
<td>PC 317</td>
<td>626-914-8853</td>
<td><a href="mailto:rsolis@citruscollege.edu">rsolis@citruscollege.edu</a></td>
</tr>
</tbody>
</table>

Contact Information

Division
Career, Technical and Continuing Education

Administrative Secretary
Lois Bottari

Division Office
TE 147

Division Phone Number
626-852-6402

Email
computerscience@citruscollege.edu

Discipline Website
http://www.citruscollege.edu/academics/programs/cs

Learning Outcomes

This discipline prepares students to do the following:

- Work extensively with arithmetic computations and operations related to program structure, recursive functions, data manipulation, binary trees, polymorphisms, problem analysis and algorithm design.
- Improve skills in critical and analytical thinking while working in areas including problem analysis and algorithm design, operands and arguments, stack abstract data manipulation, heap manipulating, linked lists, binary trees, polymorphisms, and the effective use of contemporary compilers to design, debug, execute and deploy programs.

Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Equivalent to</th>
<th>Grade Mode</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS 140</td>
<td>Java Programming</td>
<td>3</td>
<td>CSIS 140</td>
<td>Pass/No Pass, Standard Letter</td>
<td>MATH 150.</td>
</tr>
<tr>
<td>CS 157</td>
<td>iOS Programming I</td>
<td>3</td>
<td></td>
<td>Standard Letter</td>
<td>CS 111.</td>
</tr>
<tr>
<td>CS 177</td>
<td>Unity Game Programming I</td>
<td>3</td>
<td></td>
<td>Standard Letter</td>
<td>CS 225.</td>
</tr>
</tbody>
</table>

An introduction to the principles of computer programming and software development. Topics covered include the program development cycle, developing algorithms, data and control structures, structured programming, and object-oriented programming. Data types, expressions, control structures, functions, file and stream I/O, and structured and abstract data types are introduced in this course. Microsoft's Visual Studio to help illustrate programming concepts common to modern high-level programming languages. Students must wait two years before retaking this course.

Introduction to iOS programming using Apple's Swift programming language. Students will learn to develop applications that can be run on Apple's iPhone, iPads, Apple Watch and the Apple TV. Students will use the Xcode IDE to develop iOS Apps.
CS 225
Object Oriented Programming
3 Units (AA/AS; CSU; UC)
54 lecture hours, 18 lab hours
Equivalent to: CSIS 225
Grade Mode: Standard Letter
Strongly recommended: CS 111; MATH 150.
This course introduces the discipline of computer science using a high level language, C++, utilizing programming and practical hands-on problem solving. Topics include the use of functions and parameter passing, simple I/O, control structures, user-defined data types, arrays, searching and sorting, algorithms and debugging strategies, data abstraction, concept of types and software development methods.

CS 232
Programming Concepts and Methodology II
3 Units (AA/AS; CSU; UC)
54 lecture hours, 18 lab hours
Grade Mode: Standard Letter
Prerequisite(s): CS 225.
Application of software engineering techniques to the design and development of large programs; data abstraction and structures and associated algorithms.

CS 242
Computer Architecture and Organization
3 Units (AA/AS; CSU; UC)
54 lecture hours
Grade Mode: Standard Letter
Prerequisite(s): CS 225 (or concurrent enrollment).
The organization and behavior of real computer systems at the assembly-language level. The mapping of statements and constructs in a high-level language onto sequences of machine instructions is studied, as well as the internal representation of simple data types and structures. Numerical computation is examined, noting the various data representation errors and potential procedural errors.

CS 252
Discrete Structures
3 Units (AA/AS; CSU; UC)
54 lecture hours
Grade Mode: Standard Letter
Prerequisite(s): CS 225.
This course is an introduction to the discrete structures used in Computer Science with an emphasis on their applications. Topics covered include: functions, relations and sets; basic logic; proof techniques; basics of counting; graphs and trees; and discrete probability.

CS 257
iOS Game Programming I
3 Units (AA/AS; CSU)
54 lecture hours
Grade Mode: Standard Letter
Prerequisite(s): CS 157.
This course deals with 2D game programming for the iOS platform. Students are expected to have Xcode and Swift programming experience.

CS 277
Unity Game Programming II
3 Units (AA/AS; CSU; UC)
54 lecture hours
Grade Mode: Standard Letter
Prerequisite(s): CS 177.
This is the second course in Unity game programming using the C# programming language in the Unity 3D development environment. Topics include scripting, simple AI, animations, and path finding.

Programs

Associate Degree
- ADT in Computer Science (http://catalog.citruscollege.edu/disciplines/computer-science/computer-science-adt)

Certificate of Achievement
- Gaming and Applications Development (http://catalog.citruscollege.edu/disciplines/computer-science/gaming-applications-development-certificate-achievement)