

## Computer Science AS Major - Active

Department: Computer Science

Approval: November 2015

Effective Semester: Fall 2016

Graduates of the two-year program in Computer Science will have the skills in computer programming required for transfer to a four-year college. Upon successful completion of the curriculum, students receive the Associate in Science (AS) degree. The degree program prepares students for transfer to four-year colleges for further study in Computer Science, as well as related areas such as Computer Engineering.

The curriculum includes instruction in the fundamentals of problem solving and analysis, programming, data structures, and architecture. Additional requirements include Calculus, Physics and Discrete Mathematics.

Students who complete the two-year Associate in Science degree program are encouraged to continue their education and earn a Bachelor's degree. City College of San Francisco has transfer agreements with many of the California State Universities and University of California campuses. Students who are interested in transferring after completion of the two-year degree program should consult the "Transfer Information" section of the catalog and discuss their plans with their program advisor or counselor. So as to not duplicate course work, it is recommended that you try to satisfy the requirements of the transfer institution as well as those of City College. If you wish to substitute another class because of specific requirements of the transfer institution you will attend, consult with the Computer Science Department Advisor. Four-year universities may have additional or different course requirements for completion of lower division. Students need to check the particular institution for their requirements. Students should pay particular attention to which programming series they take (CS 110A-B-C or CS 111A-B-C), as different four-year schools may take one or the other track. The web site [www.assist.org](http://www.assist.org) can provide additional information about applicable courses for transfer.

### Learning Outcomes

Upon completion of this program, students will be able to:

- Solve problems and conduct experiments in basic computer science and physics.
- Solve mathematical problems using discrete math and calculus.
- Create and program algorithmic solutions to solve problems.

Enrollment is recommended only to students who have a solid understanding of Algebra (at the level of Math 60 or higher).

Assuming students start this AS with transfer-level math and English eligibility, the minimum time for completion is 4 semesters. Completion time will vary based on student preparation and number of units completed per semester.

### Courses Required for the Major in Computer Science AS

Course	Units
<b>Required courses:</b>	
CS 270 - Computer Architecture with Assembly Language	4.00
MATH 110A - Calculus I	5.00
MATH 110B - Calculus II	5.00
MATH 115 - Discrete Mathematics	3.00
PHYC 4A - Classical Mechanics for Scientists and Engineers	3.00
PHYC 4AL - Mechanics Laboratory for Scientists and Engineers	1.00
PHYC 4B - Electromagnetism for Scientists and Engineers	3.00
PHYC 4BL - Electromagnetism Laboratory for Scientists and Engineers	1.00
Total:	25.00
<b>Choose one of the following courses:</b>	
CS 110A - Intro to Programming: C++	4.00
CS 111A - Introduction to Programming: Java	4.00
Total:	4.00
<b>Choose one of the following courses:</b>	
CS 110B - Programming Fundamentals: C++	4.00

CS 111B - Programming Fundamentals: Java	4.00
Total:	4.00
<b>Choose one of the following courses:</b>	
CS 110C - Data Structures and Algorithms: C++	4.00
CS 111C - Data Structures and Algorithms: Java	4.00
Total:	4.00
<b>Recommended additional coursework:</b>	
CS 160A - Introduction to Unix/Linux	2.00
CS 150A - SQL Server Databases	3.00
or	
CS 151A - Oracle SQL Databases	3.00
or	
CS 155A - MySQL Databases	3.00
CS 130A - PHP Programming	4.00
CS 131A - Python Programming	4.00
CS 132A - Ruby Programming	3.00
CNIT 131 - Internet Basics and Beginning HTML	3.00
CNIT 132 - Intermediate HTML and CSS	3.00
CNIT 133 - JavaScript, jQuery, AJAX	3.00
CS 212 - iPhone Programming	4.00
Total:	0.00
<b>Total:</b>	<b>37.00</b>

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