



Legend

*Aspirational

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..... In development

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INDUSTRY CERTIFICATIONS

ADVANCED LEVEL

MID LEVEL

ENTRY LEVEL

BA/BS Degree/Transfer

AA./A.S Degree/Transfer

AS Computer Science

CS 110A OR 111A Intro to Programming: C++ or Java (3 unit)
 CS 110B OR 111B Programming Fundamentals I: C++ or Java (3 units)
 CS 110C OR 111C Data Structures and Algorithms: C++ or Java (3 units)
 CS 270 Computer Arch with Assembly Language (3 units)
 MATH 110A Calculus I (4 units)
 MATH 110B Calculus II (4 units)
 MATH 115 Discrete Mathematics (3 units)
 PHYC 4A Physics for Scientists and Engineers (3 units)
 PHYC 4AL Physics Lab for Scientists and Engineers (1 unit)
 PHYC 4B Physics for Scientists and Engineers (3 units)
 PHYC 4BL Physics Lab for Scientists and Engineers (1 unit)

General Education

General Education

General Education

Advanced Level

Linux Administration II
 CS 260B Linux Network Administration (3 units)
 CNIT 106 or CNIT 201E Introduction to Networks or Network Fundamentals (3 units)
 CS 131A or CS 113A Python Programming or Perl Programming (3 units)

Computer Programming: C++ Certificate 6
 CS 110A Intro to Programming: C++ (3 units)
 CS 110B Programming Fundamentals: C++ (3 units)
 CS 110C Data Structures & Algorithms: C++ (3 units)
 CS 160A Intro to Unix/Linux 2 CS 177 or CS 270 Software Engineering or Computer Arch. w/ Assembly Language (3 units), CS 280 or CS150A or CS 151A or CS 155A Introduction to Parallel and Cloud Programming or SQL Server Databases or Oracle SQL Databases or MySQL Databases (3 units)

Data Science

Certificate of Achievement - Web Application Programming (18 - 23 units)
 CS 160A Introduction to Unix/Linux (2 units)
 CS 155a MySQL Databases (3 units)
 CNIT 132 Intermediate HTML and CSS (3 units)
 CNIT 133 Interactive Web Pages: Javascript, JQuery, and AJAX (3 units)
 CS 130A or CS 131A or CS 132A or CS 113A or CS 114B or CS 111A or CS 111B PHP Programming, or Python Programming, or Ruby Programming, or Intro to Perl Programming, or C++ Programming, or Intro to Programming: Java or Programming Fundamentals: Java (3 units)
 CS 130B or CS 232 or CNIT 134 or CS 211E Advanced PHP or Ruby on Rails Web Development or Sever-side Tech. for the Web or Advanced Java Enterprise Edition (3 units)
 CS 195/CNIT 195 or CS 177 or CS 198 or CNIT 197 or CNIT 198 Website Development Practicum, or Software Engineering, or Industry Internship or Internship and Work Experience (1-3 units)
Recommended Additional Coursework:
 CNIT 131, CNIT 131H, CNIT 129, CS 142, CNIT 131A, CNIT 133M, CS 212, CS 211D, CS 311D, CS 155P

Certificate of Achievement - Computer Programming: Java (20 units)
Required courses:
 CS 111A - Introduction to Programming: Java (4 units)
 CS 111B - Programming Fundamentals: Java (4 units)
 CS 111C - Data Structures and Algorithms: Java (4 units)
 CS 160A - Introduction to Unix/Linux (2 units)
 CS 211S - Advanced Java: Standard Edition (3 units)
Choose one of the following 3 unit courses:
 CS 150A - SQL Server Databases (3 units), CS 151A - Oracle SQL Databases (3 units), CS 155A - MySQL Databases (3 units), CS 211E - Advanced Java: Enterprise (3 units)

Database Programming: Microsoft SQL Server with C# Certificate
 CS 111A Intro to Programming: Java (3 units)
 CS 114B or CS 111B C# Programming or Programming Fundamentals: Java (3 units)
 CS 114D C# with Databases (3 units)
 CS 150A SQL Server Databases (3 units)
 CS 150P SQL Server Programming Using T-SQL (4 units)
 CS 159A Database Design and Modeling (3 units)

Database Programming: MySQL/Open Source Technologies Certificate
 CS 155A MySQL Databases (3 units)
 CS 155B MySQL Database Administration (3 units)
 CS 155P Programming with MySQL (3 units)
 CS 159A Database Design and Modeling (3 units)
 CS 130A or CS 113A or CS 131A or CS 132A PHP Programming or Introduction to Perl Programming or Python Programming or Ruby Programming (3 units)

Database Programming: Oracle Certificate
 CS 151A Oracle SQL Databases (3 units)
 CS 151B Oracle Database Administration (3 units)
 CS 151P Oracle PL/SQL Programming (4 units)
 CS 159A Database Design and Modeling (3 units)

Certificate of Accomplishment - Android App Programming (17 units)
Required Courses:
 CS 111A Intro to Programming: Java (3 units)
 CS 111B Programming Fundamentals: Java (3 units)
 CS 211S Advanced Java: Standard Edition (3 units)
 CS 211D Android Programming (3 units)
 CS 311A Intro to Programming: Java 3
Recommended Additional Coursework: CS 160A, CS 155A, CS 111C, CNIT 133M, CNIT 133, and CS 142 or CNIT 131A

Certificate of Accomplishment - iPhone App Programming (8 - 12 units)
Choose one of the following Programming Fundamentals courses or course combinations:
 CS 112 Beginning iPhone Programming using Swift (4 units)
 CS 110A - Intro to Programming: C++ (4 units) and CS 110B - Programming Fundamentals: C++ (4 units)
 CS 111A - Introduction to Programming: Java (4 units) and CS 111B - Programming Fundamentals: Java (4 units)
Required capstone course:
 CS 212 - iPhone Programming (4 units)
Recommended additional coursework:
 CNIT 113 - Technology of Smartphones & Mobile Devices (3 units)
 CS 155A - MySQL Databases (3 units)
 CS 111C - Data Structures and Algorithms: Java (4 units) or CS 110C - Data Structures and Algorithms: C++ (4 units)
 CNIT 133M - Mobile Web w/HTML, CSS & JS (3 units)

Mid Level

Linux Administration I Certificate
 CS 160A Introduction to Unix/Linux (2 units)
 CS 160B Unix/Linux Shell Scripting (2 units)
 CS 260A Linux System Administration (3 units)
 CS 260P Linux Administration PProjects (1 unit)
Recommended Additional Coursework: CNIT 106, CNIT 201E, CS 113A, CS 131A

Computing Skills for Scientists Certificate
 CS 160A Introduction to Unix/Linux (2 units)
 CS 131A or CS 113A Python Programming or Introduction to Perl Programming (3 units)
 CS 155A MySQL Databases (3 units)

Entry Level

Certificate of Accomplishment - Build Automation for DevOps & QA (13 - 14 units)
Required Courses:
 CS 160A Introduction to Unix/Linux (2 units)
 CS 160B Unix/Linux Shell Scripting (2 units)
 CS 177 Software Engineering (3 units)
 CS 178 Build Automation for DevOps & QA (3 units)
Choose one of the following elective courses:
 CS 132A Ruby Programming (3 units)
 CS 131A Python Programming (4 units)
 CNIT 133 JavaScript, jQuery, AJAX (3 units)

INTEGRATED STUDENT SUPPORTS

ADVANCED LEVEL

MID LEVEL

ENTRY LEVEL

JOBS AND WAGES

ADVANCED LEVEL

-Computer Network Support Specialists, \$26.86-\$46.47/hr
 -Web Developers, \$24.43-\$52.69/hr
 -Desktop Publishers, \$18.03-\$26.57/hr

MID LEVEL

-Computer User Support Specialists, \$21.43-\$36.57/hr

ENTRY LEVEL

-Computer Operators, \$17.57-\$28.30/hr

COMPUTER SCIENCE

BA - Computer Science	BA - Computer Engineering	BA - Software Engineering
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Advanced Level

AS - COMPUTER SCIENCE

CS 110A OR 111A Intro to Programming: C++ or Java (3 unit)
 CS 110B OR 111B Programming Fundamentals I: C++ or Java (3 units)
 CS 110C OR 111C Data Structures and Algorithms: C++ or Java (3 units)
 CS 270 Computer Arch with Assembly Language (3 units)
 MATH 110A Calculus I (4 units)
 MATH 110B Calculus II (4 units)
 MATH 115 Discrete Mathematics (3 units)
 PHYC 4A Physics for Scientists and Engineers (3 units)
 PHYC 4AL Physics Lab for Scientists and Engineers (1 unit)
 PHYC 4B Physics for Scientists and Engineers (3 units)
 PHYC 4BL Physics Lab for Scientists and Engineers (1 unit)

Degree pathway for students new to computer science.

PROGRAMMING	LINUX	DATABASE	APP DEVELOPMENT	WEB APPLICATION	
Mid Level					
<p>Computer Programming: C++ Certificate 6</p> <p>CS 110A Intro to Programming: C++ (3 units) CS 110B Programming Fundamentals: C++ (3 units) CS 110C Data Structures & Algorithms: C++ (3 units) CS 160A Intro to Unix/Linux 2 CS 177 or CS 270 Software Engineering or Computer Arch. w/ Assembly Language (3 units), CS 280 or CS150A or CS 151A or CS 155A Introduction to Parallel and Cloud Programming or SQL Server Databases or Oracle SQL Databases or MySQL Databases (3 units)</p>	<p>Certificate of Achievement - Computer Programming: Java (20 units)</p> <p>Required courses: CS 111A - Introduction to Programming: Java (4 units) CS 111B - Programming Fundamentals: Java (4 units) CS 111C - Data Structures and Algorithms: Java (4 units) CS 160A - Introduction to Unix/Linux (2 units) CS 211S - Advanced Java: Standard Edition (3 units) Choose one of the following 3 unit courses: CS 150A - SQL Server Databases (3 units), CS 151A - Oracle SQL Databases (3 units), CS 155A - MySQL Databases (3 units), CS 211E - Advanced Java: Enterprise (3 units)</p>	<p>Linux Administration II</p> <p>CS 260B Linux Network Administration (3 units) CNIT 106 or CNIT 201E Introduction to Networks or Network Fundamentals (3 units) CS 131A or CS 113A Python Programming or Perl Programming (3 units)</p>	<p>Database Programming: Microsoft SQL Server with C# Certificate of Achievement (19 units)</p> <p>CS 111A Intro to Programming: Java (3 units) CS 114B or CS 111B C# Programming or Programming Fundamentals: Java (3 units) CS 114D C# with Databases (3 units) CS 150A SQL Server Databases (3 units) CS 150P SQL Server Programming Using T-SQL (4 units) CS 159A Database Design and Modeling (3 units)</p> <p>Database Programming: MySQL/Open Source Technologies Certificate of Accomplishment (15 units)</p> <p>CS 155A MySQL Databases (3 units) CS 155B MySQL Database Administration (3 units) CS 155P Programming with MySQL (3 units) CS 159A Database Design and Modeling (3 units) CS 130A or CS 113A or CS 131A or CS 132A PHP Programming or Introduction to Perl Programming or Python Programming or Ruby Programming (3 units)</p> <p>Database Programming: Oracle Certificate of Accomplishment (13 units)</p> <p>CS 151A Oracle SQL Databases (3 units) CS 151B Oracle Database Administration (3 units) CS 151P Oracle PL/SQL Programming (4 units) CS 159A Database Design and Modeling (3 units)</p>	<p>Certificate of Accomplishment - iPhone App Programming (8 - 12 units)</p> <p>Choose one of the following Programming Fundamentals courses or course combinations: CS 112 Beginning iPhone Programming using Swift (4 units) CS 110A - Intro to Programming: C++ (4 units) and CS 110B - Programming Fundamentals: C++ (4 units) CS 111A - Introduction to Programming: Java (4 units) and CS 111B - Programming Fundamentals: Java (4 units) Required capstone course: CS 212 - iPhone Programming (4 units) Recommended additional coursework: CNIT 113 - Technology of Smartphones & Mobile Devices (3 units) CS 155A - MySQL Databases (3 units) CS 111C - Data Structures and Algorithms: Java (4 units) or CS 110C - Data Structures and Algorithms: C++ (4 units) CNIT 133M - Mobile Web w/HTML, CSS & JS (3 units)</p>	<p>Certificate of Achievement - Web Application Programming (18 - 23 units)</p> <p>CS 160A Introduction to Unix/Linux (2 units) CS 155A MySQL Databases (3 units) CNIT 132 Intermediate HTML and CSS (3 units) CNIT 133 Interactive Web Pages: Javascript, jQuery, and AJAX (3 units) CS 130A or CS 131A or CS 132A or CS 113A or CS 114B or CS 111A or CS 111B PHP Programming, or Python Programming, or Ruby Programming, or Intro to Perl Programming, or C++ Programming, or Intro to Programming: Java or Programming Fundamentals: Java (3 units) CS 130B or CS 232 or CNIT 134 or CS 211E Advanced PHP or Ruby on Rails Web Development or Server-side Tech. for the Web or Advanced Java Enterprise Edition (3 units) CS 195/CNIT 195 or CS 177 or CS 198 or CNIT 197 or CNIT 198 Website Development Practicum, or Software Engineering, or Industry Internship or Internship and Work Experience (1-3 units)</p>
Entry Level					
	<p>Linux Administration I Certificate</p> <p>CS 160A Introduction to Unix/Linux (2 units) CS 160B Unix/Linux Shell Scripting (2 units) CS 260A Linux System Administration (3 units) CS 260P Linux Administration Projects (1 unit) Recommended Additional Coursework: CNIT 106, CNIT 201E, CS 113A, CS 131A</p>	<p>Computing Skills for Scientists Certificate of Accomplishment</p> <p>CS 160A Introduction to Unix/Linux (2 units) CS 131A or CS 113A Python Programming or Introduction to Perl Programming (3 units) CS 155A MySQL Databases (3 units)</p>		<p>Certificate of Accomplishment - Build Automation for DevOps & QA (13 - 14 units)</p> <p>Required Courses: CS 160A Introduction to Unix/Linux (2 units) CS 160B Unix/Linux Shell Scripting (2 units) CS 177 Software Engineering (3 units) CS 178 Build Automation for DevOps & QA (3 units) Choose one of the following elective courses: CS 132A Ruby Programming (3 units) CS 131A Python Programming (4 units) CNIT 133 JavaScript, jQuery, AJAX (3 units)</p>	

Should this stay?

JOB AND WAGES

CERTIFICATES

Certificates for students with related previous experience and/or degrees