

Computer Science – Computer Programming (AAS)

Associate in Applied Science

Minimum of 61 credit hours

Computers, today, literally run the world. Or, at least their programmers do.

If you're interested in computer science and the behind-the-scenes roles of programmers, you can work toward an associate degree in applied science with a computer programming option at Oklahoma City Community College.

OCCC provides a strong foundation in computer science and is a National Center of Academic Excellence in Cyber Defense.

COURSE SEQUENCE

Course ID	Course Name	Credits	Type	Min GD
Term 1				
SCL 1001	Success in College and Life Students will learn best practices for academic, career, and personal success. Students will discover their individual strengths, interests, and values to create a personalized plan; select and utilize resources that are applicable to their growth and success; and engage as active and responsible members of the academic community. This course should be taken during a student's first semester of college work at Oklahoma City Community College and is a required course in degree plans to satisfy the Life Skills requirement. Prerequisites: ENGL 0106 or adequate reading/writing assessment scores	1	Life Skills	
CS 1103	Introduction to Computers and Applications This hands-on course affords students a basic understanding of computers and their application. Upon completion of this course, the student will be able to demonstrate the ability to use a computer operating system, an office suite, productivity tools, as well as the Internet at an introductory level. Advanced Standing is available. Prerequisites: MATH 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures	3	Gen Ed	C
ENGL 1113	English Composition I The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate library material and incorporate researched materials into compositions. Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures	3	Gen Ed	
Term 2				
CS 1143	Beginning Programming Designed for Computer Science majors, this course affords students a basic understanding of computer programming. Students will utilize accepted programming concepts and perform number system conversions and arithmetic. In addition, they will design and code structured modular programs using design tools such as hierarchy charts, flowcharts, and pseudocode. Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; MATH 0313 or adequate math placement or by evaluation. § Criteria for evaluation is in division office.	3	Major	C
CS 2413	Web Site Development	3	Major	C

Students will develop the skills needed to create a web site for personal or professional use. Design considerations will include accessibility standards, navigation techniques, audience needs, browser/platform concerns, and connection speeds. HTML, CSS along with a combination of other current technologies will be utilized for topics such as: building, formatting, enhancing, and publishing pages; maintaining a web site; manipulating graphics; creating printer and mobile versions; and incorporating JavaScript at an introductory level. **Prerequisites:** MATH 0203 or adequate math placement. ENGL 0203, adequate placement score, or by meeting determined placement measures.

Term 3

ENGL 1213	English Composition II	OR	Gen Ed
<p>In this advanced writing course, students will create essays that explore and evaluate a variety of issues and perspectives suggested by fiction, poetry, drama, essays, and other types of cultural texts. Students will refine and augment the writing techniques they learned in ENGL 1113 or ENGL 1103 to develop well-reasoned, well-structured arguments in a clear, fluid, and engaging prose style. Prerequisites: ENGL 1103 or ENGL 1113 taken within the last year, with strong encouragement for immediate continuation.</p>			
ENGL 1233	Technical Writing for the Workplace	OR	Gen Ed
<p>This course will expose students to technical communication and will allow students to practice professional methods of writing in the workplace. In addition to constructing technical documents appropriate for use in professional and job-related environments, students will learn about rhetorical methods for presenting technical information in ethical and formal prose designed for clear and effective communication with employers and colleagues. This course will equip the student with written and oral communication skills necessary for sharing information and discussing content in professional settings; developing an awareness of technical genres; utilizing technological platforms for constructing documents; using visuals and graphics professionally; writing professional correspondence; constructing reports; designing project proposals; and composing instructions. Prerequisites: ENGL 1113 or ENGL 1103; MATH 0203 College Prep Math II or adequate Math Placement Test Score</p>			
COM 1123	Interpersonal Communications	OR	Gen Ed
<p>The student will be able to identify why certain things happen as they do when two or more individuals come together to communicate for a specific purpose. The student must attest to his or her ability to understand the principles of interpersonal communication with emphasis on dyads, small groups, analysis of communication models and nonverbal communication, applying understanding to the major types of interpersonal communication problems in the work environment and in daily human relations. Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures</p>			
COM 2213	Intro to Public Speaking	3	Gen Ed
<p>Given the principles of effective listening and speaking, the student will assimilate those skills into his or her physical and psychological worlds. After being exposed to public, business and professional speaking, the student will apply the principles of invention, organization, style, and delivery through practical exercises and will use the principles of rhetorical criticism in discussing speeches delivered in class. Prerequisites: ENGL 0106 or adequate placement score</p>			
CS 2163	Java	3	Major C
<p>Student will develop object-oriented Java applications and applets, which demonstrate comprehension of fundamental programming structures, object-oriented programming, graphics, event handling, interface components, programming for the Internet, data structures, and exception handling. Prerequisites: MATH 0313 or adequate math placement, CS 1143 or by evaluation. § Criteria for evaluation is in division office.</p>			

Term 4

CS 2173	Oracle	OR	Major	C
<p>Using Oracle as a platform, students will learn relational database concepts, sound database design and development techniques, and SQL commands. Topics include how to create and modify database tables; retrieve data from database tables; use subqueries to retrieve data; use table constraints, sequences, indexes, synonyms, views and functions; create users and assign privileges to users; create printable reports through SQL*Plus commands; practice SQL statement tuning. Prerequisites: MATH 0313 or adequate math placement, CS 1143.</p>				
CS 2443	SQL Server	3	Major	C
<p>Students will learn terms, concepts and features needed to work with most relational databases. Using SQL Server databases and tools, they will learn concepts on how to design a database, retrieve data from and manipulate data in a database. They will also learn SQL programming and will be able to work with database features that will include views, stored procedures, functions, triggers and others. Prerequisites: CS 1143 or CS 1543</p>				
CS 2463	Advanced Java	3	Major	C

Student will develop Java applications which demonstrate comprehension of advanced programming structures and practices, including object-oriented programming, fundamental data structures (arrays, vectors, linked lists, stacks, and queues), GUI applications using Swing and JavaFX, and concurrent computing using threads and semaphores. **Prerequisites:**
CS 2163

Term 5

CS 2113	Computer Based Information Systems	3	Major	C
	Covers theory and practice for the design and use of computer-based information systems in organizations, with a focus on spreadsheets and databases for storage, processing, retrieval and presentation of data. Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; MATH 0203 or adequate math placement.			
CS 2453	Visual Basic	3	Major	C
	The students will use Visual Basic to create object-oriented, event-driven programs. This course teaches the students to handle the visual interface and also learn programming concepts that include objects, decisions, loops, dialog boxes, arrays, menus, subs, functions, files, simple data access and various other programming topics as they apply to Visual Basic. This course satisfies the computer proficiency requirement. Prerequisites: MATH 0313 or adequate math placement, CS 1143 or by evaluation. § Criteria for evaluation is in division office.			
CS	Computer Science Elective Computer Science elective	3	Support	C

Term 6

CS 2513	Client-Side Programming	3	Major	C
	Students will create dynamic web applications using client-side programming. A combination of current scripting/programming languages and web page authoring software will be utilized for topics such as: using the Document Object Model, coding event handlers, validating user input, manipulating graphics, and creating interactive web pages. Prerequisites: MATH 0313 or adequate math placement, CS 2413 and CS 1143 or by evaluation. § Criteria for evaluation is in division office.			
CS 2563	C#	3	Major	C
	Students will develop C# programs using the .NET framework that demonstrate comprehension of language syntax, fundamental program structures, object-oriented programming, windows applications, web applications, and database applications. Students will use ADO.NET, XML, ASP.NET, SOAP, and REST to create their applications. Prerequisites: CS 2163			

Term 7

MATH 1483	Functions and Modeling	3	Gen Ed	
	The student will demonstrate: an understanding of the general concepts of relation and function and specifically of polynomial, rational, exponential and logarithmic functions; the ability to solve systems of equations by utilizing matrices and determinants; and, the ability to solve practical problems using algebraic and digital techniques. Prerequisites: MATH 0313 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures			
CS 2363	C++	3	Major	C
	This course is a continuation of the study of object-oriented programming covered in CS 2163 Java. Students will use C++ to write programs that demonstrate comprehension of the advanced object-oriented features of the C++ language and of common data structures. Topics include pointer manipulation, overloaded operators, friends, exception handling, templates, linked lists, stacks, queues, trees, and time complexity associated with sorts and searches. Prerequisites: CS 2163			

Term 8

POLSC 1113	American Federal Government	3	Gen Ed	
	A study of the principles, structure, processes and functions of the United States federal government. Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures			
CS 2183	Linux	3	Major	C

This course is an introduction to the Linux operating system for users. It is designed for those with a DOS/Windows operating system background with little or no knowledge of Linux. Topics include the development of Linux; basic Linux operating system concepts; a comparison of Linux to MS Windows; frequently used Linux programs and utilities, shells, editors, and tools; X window GUI and applications; Linux and the internet; setting up Apache web server software; basic HTML and CGI programming for Linux; use of virtual machine software to create virtual machines of guest operating system on top of host operating system. **Prerequisites:** MATH 0203 or adequate math placement, CS 1103 or by evaluation. § Criteria for evaluation is in division office.

CS 2373	iOS Programming	3	Major	C
	Students will learn the skills to develop mobile applications on Apple mobile devices. Topics covered include Swift programming language, mobile app software architecture, Apple Integrated Development Environment Xcode, Interface Builder, and other related Apple software development kit frameworks.			
	Prerequisites: CS 1543 or CS 1143			

Term 9

CS 2623	Server-Side Programming	3	Major	C
	Students will create interactive and dynamic web applications using server-side programming. A combination of current scripting/programming languages and web page authoring software will be used for topics such as maintaining state, processing data from the user, creating cookies, and interacting with databases. Prerequisites: MATH 0313 or adequate math placement, CS 1143 and CS 2413 or by evaluation. § Criteria for evaluation is in division office.			
HIST 1483	U.S. History to 1877	OR	Gen Ed	
	After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement. Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures			
HIST 1493	U.S. History 1877 to Present	3	Gen Ed	
	After analyzing events in American history from 1877 to the present in such areas as geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement. Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures			

COURSE GROUPING

Major Courses (39 credit hours) Computer Science: CS 1143 (C), CS 2113 (C), CS 2163 (C), CS 2173 (C) or CS 2443 (C), CS 2363 (C), CS 2413 (C), CS 2453 (C), CS 2463 (C), CS 2513 (C), CS 2563 (C), CS 2623 (C), CS 2183 (C), CS 2373 (C)

General Education Courses: (18 credit hours) Communications: ENGL 1213 or ENGL 1233 or COM 1123 or COM 2213 Computer Science: CS 1103 (C)

English: ENGL 1113

History: HIST 1483 or HIST 1493

Mathematics: MATH 1483

Political Science: POLSC 1113

Life Skills Courses: (1 credit hour) Life Skills: SCL 1001

Support Courses: (3 credit hours) Computer Science electives (C)

PROGRAM NOTES

Notes: This Technical and Occupational program is designed to prepare students to enter the job force following completion. See Technical and Occupational Programs in the general information section of the catalog. Must have a grade of "C" or higher in all Computer Science courses.

COURSE DESCRIPTIONS

COMMUNICATIONS

COM 1123 - Interpersonal Communications

The student will be able to identify why certain things happen as they do when two or more individuals come together to communicate for a specific purpose. The student must attest to his or her ability to understand the principles of interpersonal communication with emphasis on dyads, small groups, analysis of communication models and nonverbal communication, applying understanding to the major types of interpersonal communication problems in the work environment and in daily human relations.

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

Credits: 3

COM 2213 - Intro to Public Speaking

Given the principles of effective listening and speaking, the student will assimilate those skills into his or her physical and psychological worlds. After being exposed to public, business and professional speaking, the student will apply the principles of invention, organization, style, and delivery through practical exercises and will use the principles of rhetorical criticism in discussing speeches delivered in class.

Prerequisites: ENGL 0106 or adequate placement score

Credits: 3

COMPUTER SCIENCE

CS 1103 - Introduction to Computers and Applications

This hands-on course affords students a basic understanding of computers and their application. Upon completion of this course, the student will be able to demonstrate the ability to use a computer operating system, an office suite, productivity tools, as well as the Internet at an introductory level. Advanced Standing is available.

Prerequisites: MATH 0103 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

Credits: 3

CS 1143 - Beginning Programming

Designed for Computer Science majors, this course affords students a basic understanding of computer programming. Students will utilize accepted programming concepts and perform number system conversions and arithmetic. In addition, they will design and code structured modular programs using design tools such as hierarchy charts, flowcharts, and pseudocode.

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; MATH 0313 or adequate math placement or by evaluation. § Criteria for evaluation is in division office.

Credits: 3

CS 2113 - Computer Based Information Systems

Covers theory and practice for the design and use of computer-based information systems in organizations, with a focus on spreadsheets and databases for storage, processing, retrieval and presentation of data.

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures; MATH 0203 or adequate math placement.

Credits: 3

CS 2163 - Java

Student will develop object-oriented Java applications and applets, which demonstrate comprehension of fundamental programming structures, object-oriented programming, graphics, event handling, interface components, programming for the Internet, data structures, and exception handling.

Prerequisites: MATH 0313 or adequate math placement, CS 1143 or by evaluation. § Criteria for evaluation is in division office.

Credits: 3

CS 2173 - Oracle

Using Oracle as a platform, students will learn relational database concepts, sound database design and development techniques, and SQL commands. Topics include how to create and modify database tables; retrieve data from database tables; use subqueries to retrieve data; use table constraints, sequences, indexes, synonyms, views and functions; create users and assign privileges to users; create printable reports through SQL*Plus commands; practice SQL statement tuning.

Prerequisites: MATH 0313 or adequate math placement, CS 1143.

Credits: 3

CS 2183 - Linux

This course is an introduction to the Linux operating system for users. It is designed for those with a DOS/Windows operating system background with little or no knowledge of Linux. Topics include the development of Linux; basic Linux operating system concepts; a comparison of Linux to MS Windows; frequently used Linux programs and utilities, shells, editors, and tools; X window GUI and applications; Linux and the internet; setting up Apache web server software; basic HTML and CGI programming for Linux; use of virtual machine software to create virtual machines of guest operating system on top of host operating system.

Prerequisites: MATH 0203 or adequate math placement, CS 1103 or by evaluation. § Criteria for evaluation is in division office.

Credits: 3

CS 2363 - C++

This course is a continuation of the study of object-oriented programming covered in CS 2163 Java. Students will use C++ to write programs that demonstrate comprehension of the advanced object-oriented features of the C++ language and of common data structures. Topics include pointer manipulation, overloaded operators, friends, exception handling, templates, linked lists, stacks, queues, trees, and time complexity associated with sorts and searches.

Prerequisites: CS 2163

Credits: 3

CS 2373 - iOS Programming

Students will learn the skills to develop mobile applications on Apple mobile devices. Topics covered include Swift programming language, mobile app software architecture, Apple Integrated Development Environment Xcode, Interface Builder, and other related Apple software development kit frameworks.

Prerequisites: CS 1543 or CS 1143

Credits: 3

CS 2413 - Web Site Development

Students will develop the skills needed to create a web site for personal or professional use. Design considerations will include accessibility standards, navigation techniques, audience needs, browser/platform concerns, and connection speeds. HTML, CSS along with a combination of other current technologies will be utilized for topics such as: building, formatting, enhancing, and publishing pages; maintaining a web site; manipulating graphics; creating printer and mobile versions; and incorporating JavaScript at an introductory level.

Prerequisites: MATH 0203 or adequate math placement. ENGL 0203, adequate placement score, or by meeting determined placement measures.

Credits: 3

CS 2443 - SQL Server

Students will learn terms, concepts and features needed to work with most relational databases. Using SQL Server databases and tools, they will learn concepts on how to design a database, retrieve data from and manipulate data in a database. They will also learn SQL programming and will be able to work with database features that will include views, stored procedures, functions, triggers and others.

Prerequisites: CS 1143 or CS 1543

Credits: 3

CS 2453 - Visual Basic

The students will use Visual Basic to create object-oriented, event-driven programs. This course teaches the students to handle the visual interface and also learn programming concepts that include objects, decisions, loops, dialog boxes, arrays, menus, subs, functions, files, simple data access and various other programming topics as they apply to Visual Basic. This course satisfies the computer proficiency requirement.

Prerequisites: MATH 0313 or adequate math placement, CS 1143 or by evaluation. § Criteria for evaluation is in division office.

Credits: 3

CS 2463 - Advanced Java

Student will develop Java applications which demonstrate comprehension of advanced programming structures and practices, including object-oriented programming, fundamental data structures (arrays, vectors, linked lists, stacks, and queues), GUI applications using Swing and JavaFX, and concurrent computing using threads and semaphores.

Prerequisites: CS 2163

Credits: 3

CS 2513 - Client-Side Programming

Students will create dynamic web applications using client-side programming. A combination of current scripting/programming languages and web page authoring software will be utilized for topics such as: using the Document Object Model, coding event handlers, validating user input, manipulating graphics, and creating interactive web pages.

Prerequisites: MATH 0313 or adequate math placement, CS 2413 and CS 1143 or by evaluation. § Criteria for evaluation is in division office.

Credits: 3

CS 2563 - C#

Students will develop C# programs using the .NET framework that demonstrate comprehension of language syntax, fundamental program structures, object-oriented programming, windows applications, web applications, and database applications. Students will use ADO.NET, XML, ASP.NET, SOAP, and REST to create their applications.

Prerequisites: CS 2163

Credits: 3

CS 2623 - Server-Side Programming

Students will create interactive and dynamic web applications using server-side programming. A combination of current scripting/programming languages and web page authoring software will be used for topics such as maintaining state, processing data from the user, creating cookies, and interacting with databases.

Prerequisites: MATH 0313 or adequate math placement, CS 1143 and CS 2413 or by evaluation. § Criteria for evaluation is in division office.

Credits: 3

ELECTIVES**CS - Computer Science Elective**

Computer Science elective

Credits: 3

ENGLISH**ENGL 1113 - English Composition I**

The student will write well-developed compositions which demonstrate the principles of unity, coherence, and organization and which contain specific details and vivid language. The students will locate library material and incorporate researched materials into compositions.

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

Credits: 3

ENGL 1213 - English Composition II

In this advanced writing course, students will create essays that explore and evaluate a variety of issues and perspectives suggested by fiction, poetry, drama, essays, and other types of cultural texts. Students will refine and augment the writing techniques they learned in ENGL 1113 or ENGL 1103 to develop well-reasoned, well-structured arguments in a clear, fluid, and engaging prose style.

Prerequisites: ENGL 1103 or ENGL 1113 taken within the last year, with strong encouragement for immediate continuation.

Credits: 3

ENGL 1233 - Technical Writing for the Workplace

This course will expose students to technical communication and will allow students to practice professional methods of writing in the workplace. In addition to constructing technical documents appropriate for use in professional and job-related environments, students will learn about rhetorical methods for presenting technical information in ethical and formal prose designed for clear and effective communication with employers and colleagues. This course will equip the student with written and oral communication skills necessary for sharing information and discussing content in professional settings; developing an awareness of technical genres; utilizing technological platforms for constructing documents; using visuals and graphics professionally; writing professional correspondence; constructing reports; designing project proposals; and composing instructions.

Prerequisites: ENGL 1113 or ENGL 1103; MATH 0203 College Prep Math II or adequate Math Placement Test Score

Credits: 3

HISTORY

HIST 1483 - U.S. History to 1877

After analyzing events in American history from 1400 to 1877 in such areas as revolution, geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

Credits: 3

HIST 1493 - U.S. History 1877 to Present

After analyzing events in American history from 1877 to the present in such areas as geographic and social mobility, political reform, government precedents and war, students will be able to identify patterns of present day mobility, describe governmental operations in their society and help resolve conflict in society based on the student's search for change, precedents, and conflict in the American past. A general education requirement.

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

Credits: 3

MATHEMATICS

MATH 1483 - Functions and Modeling

The student will demonstrate: an understanding of the general concepts of relation and function and specifically of polynomial, rational, exponential and logarithmic functions; the ability to solve systems of equations by utilizing matrices and determinants; and, the ability to solve practical problems using algebraic and digital techniques.

Prerequisites: MATH 0313 or adequate math placement; ENGL 0203, adequate placement score, or by meeting determined placement measures

Credits: 3

POLITICAL SCIENCE

POLSC 1113 - American Federal Government

A study of the principles, structure, processes and functions of the United States federal government.

Prerequisites: ENGL 0203, adequate placement score, or by meeting determined placement measures

Credits: 3

SUCCESS IN COLLEGE AND LIFE

SCL 1001 - Success in College and Life

Students will learn best practices for academic, career, and personal success. Students will discover their individual strengths, interests, and values to create a personalized plan; select and utilize resources that are applicable to their growth and success; and engage as active and responsible members of the academic community. This course should be taken during a student's first semester of college work at Oklahoma City Community College and is a required course in degree plans to satisfy the Life Skills requirement.

Prerequisites: ENGL 0106 or adequate reading/writing assessment scores

Credits: 1