

COMPUTER SCIENCE (CS)

CS-120 Survey of Computing

4 credits, Fall/Winter/Spring/Summer

A computer competency course to familiarize students with computer concepts, software applications and the implications of living in the digital age. Introduces students to computer concepts, including, but not limited to the Microsoft Windows environment, Microsoft Office Applications, hardware terminology, social media and the Internet.

Required: Flash drive

Prerequisites: Placement in CS-120, and WRD-098 or placement in WR-121

CS-125H HTML & Web Site Design

3 credits, Fall/Winter/Spring/Summer

Hands-on approach to planning, design, and developing published web sites using HTML tags in a text editor. The class focuses on basic HTML coding using HTML 5 models. Hyperlinks, images, cascading style sheets, forms, accessibility and design principles will be covered, as well as tools such as FTP clients, accessibility checkers, and validators.

Recommended: CS-120 or equivalent experience

CS-133S Introduction to JavaScript & Server-Side Scripting

3 credits, Winter

Design, programming, testing of scripted web pages using JavaScript for client-side applications and to call PHP-based server-side applications. Introduction to fundamental concepts of interactive web pages and server-side connectivity. Covers the Document Object Model (DOM) and programming constructs like variables, operators, functions, control structures, and exception handling.

Prerequisites: CS-125H, and MTH-060 or placement in MTH-065

CS-133VB Visual Basic.NET I

3 credits, Fall/Spring

Hands-on approach to software design using object-oriented programming. Planning an application, building a user interface, using variables and constants, calculating, accumulating, counting, making decisions, using functions, and using menus.

Prerequisites: BA-131 or CS-120, and MTH-060 or placement in MTH-065

CS-135DB Microsoft Access

3 credits, Fall/Spring

Focuses on the advanced database capabilities using a current version of Microsoft Access. Topics include design, construction, and documentation of a database management system, designing reports, forms, advanced form techniques, advanced queries, customizing tables, and creating and using an application system with macros.

Prerequisites: CS-120 or equivalent level of computer literacy

CS-135I Advanced Web Design With Dreamweaver

3 credits, Spring

Plan and publish a standards-based, accessible web site via a variety of tools, including the Adobe Creative Suite. Complete market and user-needs analysis to best target site content and design. Create a graphical web site mock-up, then use CSS (including a framework and pre-processors), scripts, and multimedia to realize site goals. Emphasizes professional design techniques.

Prerequisites: CS-125H, or equivalent experience with hand-coded HTML and CSS

CS-135S Microsoft Excel

3 credits, Fall/Winter/Spring

Focuses on advanced spreadsheet capabilities using a current version of Microsoft Excel. Topics include design, construction, and documentation of spreadsheets, use of templates, multiple worksheets, complex formulas, functions and filtering, Pivot Tables, advanced chart features, sorting, database capabilities, finding data, creating subtotals, using lookup tables, finding trends and forecasting, creating and editing macros, validating data, and working with controls.

Prerequisites: CS-120 or BA-131, or equivalent level of computer literacy

CS-135W Microsoft Word

3 credits, Winter

This course focuses on advanced word processing features using the latest version of Microsoft Word. Topics include using tables, merging form letters and data source files, desktop publishing, large document capabilities including master documents and indexes, and linking and embedding objects between Office applications.

Prerequisites: BA-131 or CS-120, or equivalent level of computer literacy

CS-140 Introduction to Operating Systems

4 credits, Fall/Spring

Introduction to the theory and practical foundations of the Windows, Linux/UNIX, and macOS desktop operating systems. Discussion of and practice with OS administration through installation, configuration, networking, security, and virtualization.

Prerequisites: CS-120 or equivalent placement, and MTH-060 or placement in MTH-065, and WRD-098 or placement in WR-121

CS-140L Linux for Programmers

4 credits, Spring

Introduction to the Linux command line and software development tools. Covers how to use the command line and build tools, including VIM, GCC/G++, make, gdb, and others. Students will gain experience with the build tools by writing and debugging relatively complex programs in both C and C++.

Prerequisites: CS-162

CS-151 Networking I

4 credits, Winter

This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. This course, along with CS-152, cover the topics on the CISCO CCENT exam.

Prerequisites: CS-160 or Student Petition

CS-152 Networking II

4 credits, Spring

Practices the building and servicing of basic computer networks. Topics include physical media, network design, addressing, routing, switching, and management used in common LANs and the Internet. This course, in conjunction with CS-151, covers the topics of the CompTIA Network+ exam.

Prerequisites: CS-151 and CS-227

CS-160 Computer Science Orientation

4 credits, Fall/Winter/Spring

Examines foundational computing subjects used in Computer Science and Information Technology. Topics include computer architecture, electronic logic, data representation, networking, algorithms and programming, which are used in successive Computer Science courses. Information about degrees in Computer Science and Information Technology is also covered.

Recommended: MTH-060 or placement in MTH-065. WRD-098 or placement in WR-121. CS-120 or placement in CS-121

CS-161 Computer Science I

4 credits, Fall/Winter

Introduction to fundamental concepts of structured programming, including problem solving, algorithm and program design, data types, loops, control structures, subroutines, and arrays. Learn to write structured programs in a high level programming language.

Prerequisites: MTH-111 or placement in MTH-112, or 4 years high school math

CS-162 Computer Science II

4 credits, Winter/Spring

Introduces fundamental concepts of object oriented programming and dynamic memory management. Covers objects, classes, pointers, dynamic memory allocation, linked lists, and program correctness, verification, and testing.

Prerequisites: CS-161

CS-181 CMS Web Development

3 credits, Winter

Explores creating dynamic and interactive websites via the use of a current content management systems (CMS). Includes installation of CMS/database, working with templates, creating efficient site navigation, enhancing sites using components, modules, plugins, and extensions, to include shopping cart utilities.

Prerequisites: CS-125H, or equivalent experience with HTML & CSS

CS-201 Computer Systems II

4 credits, Fall

Introduction to computer systems from a software perspective. Topics include: Basic machine organization, system programming in C and assembly language, introduction to system programming tools (gcc, makefile, gdb), data representation (bits & bytes, characters, integers, floating point numbers), implementation of control flow, procedure calls, and complex data types at the machine level, linking and loading, exceptions and interrupts, process control and signals, system calls, file I/O, timing and improving program performance, basic memory hierarchy, and dynamic memory allocation techniques.

Prerequisites: CS-162

CS-202 Program Structures

4 credits, Winter

Students will become familiar with advanced C++ and Java syntax for object-oriented programming. Use of the file system, operating system calls, and shell-level programming; low-level debugging of high-level programs. Programming exercises will include applications of data structures and memory management techniques.

Prerequisites: CS-162

CS-225 Computer End User Support

3 credits, Fall/Spring

Addresses professional and interpersonal skills needed by technicians who support and manage hardware and software information systems. Customer service skills; troubleshooting; helpdesk operation; product needs analysis, evaluation, purchase, and installation; technical documentation and training.

Prerequisites: CS-120 or placement in CS-121 or equivalent experience. WRD-098 or placement in WR-101 or WR-121

CS-227 Computer Hardware & Repair

4 credits, Fall

An in-depth course in computer hardware. Covers operational concepts, identification, installation, configuration, and troubleshooting of power supplies, motherboards, microprocessors, memory modules, disk drives, optical drives, and expansion cards. This course, in conjunction with CS-228, covers the topics of the CompTIA A+ certification exam.

CS-228 Computer OS Maintenance & Repair

4 credits, Winter

An in-depth course in operating system maintenance and troubleshooting. Covers configuration, maintenance, and troubleshooting of desktop and mobile operating systems, the fundamentals of cloud computing, and client network configuration and troubleshooting. This course, in conjunction with CS-227, covers the topics on the CompTIA A+ certification exam.

Prerequisites: CS-227

CS-234J jQuery Web Development

3 credits, Spring

In-depth exploration of creating dynamic websites using the jQuery function library. Topics include creating AJAX applications, XML and JSON data formats, image effects like sliders and lightboxes, navigation effects, mobile-friendly effects and more.

Prerequisites: CS-133S or previous HTML and programming experience

CS-234P PHP/MySQL Web Development

3 credits, Spring

Use PHP and MySQL to develop dynamic web sites for use on the Internet. Develop web sites ranging from simple online information forms to complex online applications. Introduce programming fundamentals including variables, control structures, functions and objects. Applications developed use MySQL as the backend database and will explore database connectivity, querying, and security.

Prerequisites: CS-125H or equivalent experience

Recommended: CS-275

CS-240L Linux Administration I

4 credits, Fall/Spring

Covers the fundamentals of the Linux operating system. Topics include: system architecture, installation, command line and file system. This course, along with CS-241L, covers the topics of the Linux LPIC-1 (or CompTIA Linux+) certification exam.

Prerequisites: CS-140

CS-240M macOS Administration

3 credits, Winter

Covers the fundamentals of installing, configuring, troubleshooting, and supporting the macOS operating system. Topics include: installation and setup, user accounts, file systems, data management, applications, network configuration, network services, peripherals, startup and troubleshooting. This course covers the topics of the Apple macOS Support Essentials certification exam.

Prerequisites: CS-140

CS-240W Windows Desktop Administration

3 credits, Winter

Covers the fundamentals of installing, configuring, troubleshooting, and supporting the Windows operating system. Topics include: installation, managing disks and file systems, file access security, users, profiles and policies, groups, security, backup, remote access, printing, and troubleshooting. This course covers the topics of the Microsoft Configuring Windows Devices certification exam.

Prerequisites: CS-140

CS-250 Discrete Structures I

4 credits, Winter

Students will be introduced to discrete structures and techniques for computing. The course, which is the first in the two-term sequence, aims to convey the skills in discrete mathematics that are used in the study and practice of computer science. Topics include: Sets; Graphs and trees; Functions: properties, recursive definitions, solving recurrences; Relations: properties, equivalence, partial order; Proof techniques: inductive proof; Counting techniques and discrete probability.

Prerequisites: MTH-251

CS-251 Discrete Structures II

4 credits, Spring

Continuation of the introduction to discrete structures and techniques for computing started in CS-250. The course, which is the second in the two-term sequence, aims to convey the skills in discrete mathematics that are used in the study and practice of computer science. Topics include: Logic: propositional calculus, first-order predicate calculus; Formal reasoning: natural deduction, resolution; Applications to program correctness and automatic reasoning; Introduction to algebraic structures in computing.

Prerequisites: CS-250

CS-260 Data Structures

4 credits, Fall/Spring

Covers common data structures used for the storage and manipulation of data, as well as data abstraction, sorting algorithms, and algorithm analysis. Data structures include linked lists, stacks, queues, binary trees, btrees, hash tables, and graphs.

Prerequisites: CS-162

CS-275 Database Design

3 credits, Winter

Focuses on design of a relational database management systems (RDMS). Topics will include database development using the a) requirement, b) design, c) implementation model, database theory from flat table design to relational systems, entity-relationship models, one-to-one, one-to-many, and many-to-many relationships, referential integrity, normalization of tables, database programming and querying with SQL, and database security. Although other platforms may be demonstrated, the majority of work will be done with MySQL Server.

Prerequisites: CS-120 and BA-131, or equivalent level of computer literacy

CS-279W Windows Server Administration

4 credits, Spring

Covers the fundamentals of installing, configuring, troubleshooting, and supporting the Microsoft Windows Server operating system and network infrastructure. Topics include: installation, Active Directory, data storage, resource access, security, monitoring, and disaster recovery. This course introduces the topics of the Microsoft Installation, Storage, and Compute with Windows Server certification exam.

Prerequisites: CS-151 and CS-240W

CS-280 Computer Science/CWE

1-6 credits, Fall/Winter/Spring/Summer

Cooperative Work Experience. This course provides supervised work experience to supplement the academic classroom environment. Work examples include user support, work with computer applications or programming languages, installation or management PC computer systems, and developing websites. Variable Credit: 1-6 credits. May be repeated for up to 9 credits. Required: Student Petition.

Corequisites: CWE-281

CS-284 Network Security

3 credits, Winter

This course provides an introduction to the core security skills needed for monitoring, detecting, investigating, analyzing and responding to security events, thus protecting systems and organizations from cybersecurity risks, threats and vulnerabilities. This course covers the topics of the Cisco Cybersecurity Fundamentals and Cybersecurity Operations certification exams.

Prerequisites: CS-151

Recommended: CS-240L and CS-240W

CS-288W Windows Network Administration

4 credits, Winter

Continued coverage of network services and administration using Microsoft Windows Server. Topics include: IPv4 and IPv6 addressing, DNS, DHCP, IPAM, network protection, and remote access. This course covers the topics of the Microsoft Networking with Windows Server certification exam.

Prerequisites: CS-279W

CS-289 Web Server Administration

4 credits, Spring

An introduction to Apache httpd and Microsoft Internet Information Server. Topics include: installation, administration, security, and troubleshooting, as well as the http, https, and ftp protocols.

Prerequisites: CS-240L and CS-240W

CS-297N Networking Capstone

4 credits, Spring

The capstone course for the Computer & Network Administration AAS program. Provides the opportunity to combine the discrete information learned from program classes together towards the completion of an enterprise-level computer project. Focus can also be placed on researching, practicing, and obtaining an industry-standard certification credential. Emphasis will be placed on project planning, timeline management, creation of training documentation, and oral presentation of completed works.

Prerequisites: CS-152 and CS-288W

CS-297W Website Capstone

3 credits, Spring

The capstone course for the web development AAS programs. Provides the opportunity to function in a production design environment, work cooperatively with students from other focus areas, and research emerging website technologies. Emphasis will be placed on client interaction, project teams, and accountability, as well as the development of a professional portfolio web site or completion of a research project in an emerging web-related technology.

Prerequisites: CS-133S and CS-135I