

# COMPUTER & INFORMATION SYSTEMS

Jobs related to computer technology, information systems, network, and security are on the rise. Computer and Information Systems programs are designed around a basic core curriculum that provides an introduction to computer concepts, software applications, operating systems, networking, database, computer servicing, internet, math, human relations, and writing. Specialized options are available in computer-aided drafting, web development, networking, and cybersecurity.

Graduates work in information technology for a wide variety of commercial businesses, education, government, e-commerce, publishing, and real estate. Careers typically include positions such as personal computer technician, desktop support, network administrator, web developer, draftsman, database administrator, system administrator, and related managerial and administrative roles.

See the [Computer and Information Systems page](#) for program and contact information.

## Programs

### Career and Technical Education

#### Associate of Applied Science

- [Computer & Information Systems - Associate of Applied Science \(AAS\)](#)

#### Associate of Applied Science Option

- [Computer Aided Drafting \(CAD\) - Associate of Applied Science Option \(AASO\)](#)
- [Networking and Cybersecurity - Associate of Applied Science Option \(AASO\)](#)
- [Web Development - Associate of Applied Science Option \(AASO\)](#)

#### One-Year Certificate of Completion

- [Computer & Information Systems - One-Year Certificate of Completion \(CC1\)](#)
- [Computer Aided Drafting \(CAD\) - One-Year Certificate of Completion \(CC1\)](#)

#### Career Pathway Certificate of Completion

- [Cybersecurity - Career Pathway Certificate of Completion \(CPC\)](#)

## Transfer

### Associate of Science Oregon Transfer

- [Computer Science - Associate of Science Oregon Transfer \(ASOT\)](#)

## Courses

#### CIS 010 Computer Keyboarding (1 Credit)

Develops touch keystroking skills for persons who will be using computer terminals for information processing. Emphasis on proper techniques, speed and accuracy development on alphabetic keyboard and numeric keypad. For non-office administration majors. P/NP grading.

#### CIS 070 Introduction to Computers: Windows (2 Credits)

Gain confidence in the use of personal computers and the Windows operating system. Topics include fundamental computer terminology, introductory use of a graphic user interface including mouse usage, windows, menus, icons and dialog boxes. Also includes file management and an introduction to word processing, Web browsing and email. P/NP grading.

#### CIS 099 Selected Topics: Computer and Information Systems (1-4 Credits)

This course is in development.

#### CIS 101 Information Technology Orientation (3 Credits)

Provides an understanding of the computer-related programs available to students and their pathways to further education and employment. Explores the training and productivity habits essential for work in IT-related fields. Research, plan, and document knowledge and skills used in both academic and professional IT work.

#### CIS 120 Computer Concepts (4 Credits)

**Recommended preparation:** CIS 010 and CIS 070 or equivalent computer skills.

Follows the Internet and Computing Core Certificate (IC3) national standard for digital literacy used at numerous colleges and universities across the country as well as industry. Course objectives are broken down into three modules: Computer Fundamentals, Key Applications, and Living Online. Provides knowledge and skills needed to use computers successfully at the college level.

#### CIS 122 Introduction to Programming (4 Credits)

**Recommended preparation:** CIS 120 or CIS 124.

Introduction to computer programming for those with little or no programming experience. Provides a strong, fundamental understanding of programming. Introduces students to elementary programming concepts of algorithm design, control structures, and user interface. Students will use the basic constructs of programming including constants, variables, expressions and control structures for sequential, iterative and decision processing to solve a variety of problems.

#### CIS 124 IT Fundamentals (4 Credits)

Explores the skills and knowledge required to identify and explain the basics of computing, IT infrastructure, software development, and database use. Identify and explain computer components, install software, establish network connectivity, and prevent security risks.

#### CIS 125A Access (4 Credits)

**Recommended preparation:** CIS 131.

Introduces the most popular desktop database software, Microsoft Access. Prepares students for the latest Microsoft Office Specialist certification for Access exam which helps students validate the skills industries require. Create and modify database tables, forms, queries and reports. Focuses on optimizing databases for efficient data entry and generating comprehensive reports. Database design issues are discussed but not emphasized.

#### CIS 125A1 AutoCAD 1 (4 Credits)

**Recommended preparation:** or to be taken with CIS 120 or CIS 124.

First course in a two-term sequence introducing AutoCAD software as a drafting tool. Includes file handling, basic command function, drafting techniques, presentation and plotting. Uses architectural and mechanical applications in lab exercises to demonstrate AutoCAD commands. Work will be completed with AutoCAD.

#### CIS 125A2 AutoCAD 2 (4 Credits)

**Recommended preparation:** CIS 125A1.

Second course in a two-term sequence covering intermediate AutoCAD commands including dimension styles, templates, CAD standards, attribute blocks, attribute extraction, external references, object linking/embedding, advanced drawing set-up and plotting, and the program parameter file. Work will be completed with AutoCAD.

**CIS 125DV Digital Video Productions (4 Credits)****Recommended preparation:** CIS 120 or CIS 124.

Uses Adobe Premiere video editing software and the tools and techniques of camera setup, lighting, audio optimization, and developing creative content for distribution on the Web.

**CIS 125E Excel (4 Credits)****Recommended preparation:** (CIS 120 or CIS 124) and CIS 131.

Covers intermediate and advanced features of Microsoft Excel such as lists, pivot tables, working with multiple worksheets, templates, what-if-analysis, data tables, advanced formulas and functions, goal seek, solver, consolidating and importing data. Students will apply these Excel features to create and revise business worksheets.

**CIS 125G Photoshop (4 Credits)****Recommended preparation:** CIS 120 or CIS 124.

Covers the learning objectives as outlined by Adobe to become an Adobe Certified Associate (ACA) in visual communication using Adobe Photoshop. Outcomes include an overall understanding of Photoshop as well as setting project requirements, identifying design elements, manipulating images, and evaluating digital images.

**CIS 125I Adobe Illustrator (4 Credits)****Recommended preparation:** CIS 120 or CIS 124.

Consistent with objectives for the Adobe Certified Associate (ACA) in Graphic Design & Illustration and provides instruction in drawing, editing and layout techniques using Adobe Illustrator. Introduces the basic illustrator tools, composition rules, and complete vector-based projects such as simple illustrations, logotype, posters, and postcards.

**CIS 125V Visio (4 Credits)****Recommended preparation:** CIS 120 or CIS 124.

Introduces Microsoft Visio, a vector-based illustration tool. Learn fundamental skills while creating several types of basic diagrams including workflows, flowcharts, organizational charts, directional maps, network and floor plans.

**CIS 125WA Web Animation (4 Credits)****Recommended preparation:** CIS 124.

Explores the tools and technologies used to create vector and bitmap web animations, as well as interactivity in rich web content. Class topics include: keyframe and path-based motion graphics, vector vs. bitmap images, programming interactivity for rollover buttons, special effects, and sound. Covers the principles of two dimension animation and its uses on the web. Students make effective computer animations that can be marketed and delivered through the web.

**CIS 131 Software Applications (4 Credits)****Prerequisites:** CIS 120 or CIS 124 or COCC Computer Competency.

Explore features and techniques of both Microsoft Word and Microsoft Excel, focusing on skills that are common to IT and business users. Focus on skills needed to prepare for the Excel and Word Associate Microsoft Office Specialist Certifications.

**CIS 133JS Introduction to JavaScript (4 Credits)****Prerequisites:** CIS 122.**Recommended preparation:** CIS 195.

Learn programming fundamentals and object-oriented concepts using vanilla JavaScript syntax. Add interactivity and custom behaviors to web applications by employing front-end JavaScript techniques combined with HTML and CSS.

**CIS 133P Introduction to PHP (4 Credits)****Prerequisites:** CIS 122.**Recommended preparation:** CIS 195 and CIS135DB.

Covers programming PHP with MySQL. Examines basic techniques of problem-solving, PHP language syntax, using PHP with MySQL, and designing dynamic web pages. Students learn basic program design and construction techniques.

**CIS 135A1 AutoDESK Revit 1 (4 Credits)****Recommended preparation:** CIS 125A1.

Introduces fundamental aspects of architectural drafting with AutoDESK Revit software. Covers drafting of residential and light commercial buildings, sections and elevations, schedules, design layouts, details and working drawings.

**CIS 135A2 AutoDESK Revit 2 (4 Credits)****Recommended preparation:** CIS 135A1.

Continues with AutoDESK Revit, covering construction drawing sets, commercial planning, residential remodeling, drawing details and drawing production. Term culminates with targeted project covering aspects studied in Revit.

**CIS 135C1 AutoCAD Civil 3D (4 Credits)****Recommended preparation:** CIS 125A2.

Students will learn basic civil drafting theory along with developing drawings that include plats, related civil infrastructure, public utilities, contours and roads. Work will be completed with AutoCAD Civil 3D.

**CIS 135DB Database Theory/SQL (4 Credits)****Recommended preparation:** (CIS 120 or CIS 124 or IC3 certification) and CIS 131.

Introduces database concepts. Includes the parts of a database and database management systems as well as database design theory, the concept of normalization, and data models. Introduces SQL and several of the most popular database management systems such as Access, Microsoft SQL Server and MySQL.

**CIS 135S1 SolidWorks 1 (4 Credits)**

Introduces engineering graphics used in design and manufacturing. Includes practical applications using solid modeling software to capture design intent through part development and to create assemblies using these parts. Adheres to industrial standards and formats.

**CIS 135S2 SolidWorks 2 (4 Credits)****Recommended preparation:** CIS 135S1.

Continues the study of engineering graphics used in design and manufacturing. Includes practical applications using solid modeling software for detailed drawings, working drawing sets, sheet metal modeling, content reuse and functional design. Adheres to industrial standards and formats.

**CIS 140 A+ Essentials I (4 Credits)****Corequisites:** CIS 145.**Recommended preparation:** CIS 120 or CIS 124.

A+ Essentials is the starting point for a career in IT. Covers the fundamentals of computer technology, installation and configuration of PCs, laptops and related hardware, and basic networking concepts. Prepare for the vendor neutral CompTIA A+ Essentials certification exam (220-901). CIS 140 and 145 utilize one textbook. To become A+ certified requires you to pass both certification exams.

**CIS 145 A+ Essentials II (4 Credits)****Corequisites:** CIS 140.**Recommended preparation:** CIS 120 or CIS 124.

Prepares students with the skills and knowledge associated with the CompTIA A+ 220-902 outcomes. Covers the skills required to install and configure PC operating systems, as well as configuring common features (e.g. network connectivity and email) for mobile operating systems Android and Apple iOS. CIS 140 and CIS 145 utilize one textbook. To become A+ certified requires you to pass both certification exams.

**CIS 151C Cisco Networking (4 Credits)****Prerequisites:** CIS 179 or Comptia Network + certification.

2First of a three-course sequence to prepare the student to take the Cisco Certified Network Associate (CCNA) certification exam. The class uses the Cisco Academy online curriculum, CCNA 5.0, Introduction to Networks. Students explore the TCP/IP and Open Systems Interconnect (OSI) models, local area networks (LANs), Ethernet, cabling, topologies, configuring routers and switches, IPv4 and IPv6 addressing, subnetting, network standards and protocols. The lecture/lab environment allows the student the opportunity to practice skills learned throughout the term.

**CIS 152C Cisco Router Configuration (4 Credits)****Prerequisites:** CIS 151C.

Second of a three-course sequence to prepare the student to take the Cisco Certified Network Associate (CCNA) certification exam. Cisco Routing and Switching implements the Cisco Academy online curriculum, CCNA 5.0, Routing and Switching Essentials, developed by Cisco Systems experts. Explores switch VLANs, trunks and Inter-VLAN routing, 1Pv4 and 1Pv6 static and dynamic routing, OSPFv2 and OSPFv3, DHCP and DNS for 1Pv4 and 1Pv6, NAT, and access-lists for 1Pv4 and 1Pv6. The lecture/lab environment allows the student the opportunity to practice skills learned throughout the term.

**CIS 154C Cisco VLAN and WAN Technologies (4 Credits)****Prerequisites:** CIS 152C.

Third of a three-course sequence to prepare the student to take the Cisco Certified Network Associate (CCNA) certification exam. Cisco Scaling and Connecting Networks implements the Cisco Academy online curricula, CCNA 5.0, Scaling Networks and Connecting Networks. Students explore WAN technologies such as FrameRelay, PPP, and PPPoE, enhanced switching technologies, Etherchannel, multi-area OSPF and EIGRP, and network monitoring with Syslog, SNMP, and NetFlow. The lecture/lab environment allows the student the opportunity to practice skills learned throughout the term.

**CIS 178 Internet in Depth (4 Credits)****Recommended preparation:** CIS 120 or CIS 124.

Introduces the concepts and technologies of the Internet. Explores a wide variety of Internet protocols and examines the history and infrastructure of the Internet. Learn about web applications, E-commerce, social media, and how to create and publish a Web site with common design tools. Topics include World Wide Web, secure use of the Internet, web browser and e-mail basics, searching the Web, E-learning resources, mass communication and real-time communication on the Internet.

**CIS 179 Networking Essentials (4 Credits)****Prerequisites:** CIS 140 and CIS 145.

The course covers network technologies, installation and configuration, media and topologies, management, and security. The outcomes prepare students for job roles, which include network administrator, network technician, network installer, help desk technician and IT cable installer and the CompTIA N10-005 certification exam.

**CIS 179CL Cloud Essentials (4 Credits)**

Covers cloud services from a business perspective. Topics include the business value of cloud computing, cloud types, steps to a successful adoption of the cloud, impact and changes on IT service management, as well as risks and consequences.

**CIS 179L Linux Essentials (4 Credits)****Prerequisites:** CIS 120 or CIS 124 or COCC Computer Competency.

Introduces Linux and helps students to 1) understand Linux and the open source industry while providing knowledge of the most popular open source applications; 2) understand the major components of the Linux operating system and have the technical proficiency to work on the Linux command line; and, 3) understand the basics of security and administration related topics such as user/group management, working on the command line, and permissions.

**CIS 188 Special Studies I (1-4 Credits)**

Explores topics of current interest in the discipline. P/NP grading.

**CIS 195 Web Development I (4 Credits)****Recommended preparation:** CIS 120 or CIS 124.

Learn HTML (for structure) and CSS (for style) while exploring the fundamentals of web development. Use different techniques to create webpage elements used by modern and successful websites. Style webpages that are functional, for both desktop and mobile users, and demonstrate best practices for usability and design.

**CIS 197 CMS Web Development: WordPress (4 Credits)****Recommended preparation:** CIS 195 Web Development I.

Examines the basics of database-driven websites created using WordPress content management system (CMS), an extremely flexible and scalable technology used for making websites that need database functionality and regular content updates. Students learn through hands-on projects how to install, configure, and manage websites connected to a database. Students will learn how to create rich content for websites that offer both functionality and scalability using WordPress. Other content management systems will be explored.

**CIS 198 Computer and Information Systems Projects (3 Credits)****Recommended preparation:** (CIS 120 or CIS 124) and CIS 131.

Students are placed in local businesses working on small projects that a local business might need. Student is responsible for project, documentation and users' manuals, if necessary. Student is sponsored by a CIS instructor.

**CIS 199 Selected Topics: Computer and Information Systems (1-7 Credits)****Prerequisites:** instructor approval.

This course is in development.

**CIS 233P Web Programming (4 Credits)****Prerequisites:** CIS 133P.**Recommended preparation:** CIS 133JS.

Introduces students to techniques used to create interactive, dynamic content. Students will design interactive user interfaces (using JavaScript and XML) which will interact with custom databases residing on a server (using PHP and MySQL). The course will explore the concepts of event-driven programming to create interactive interfaces using dynamic content. Students will write server-side scripts, design custom databases to both store and provide access to content. The course will conclude with a final project where students will design their own dynamic websites.

**CIS 244 Information Systems Analysis (4 Credits)**

**Recommended preparation:** (CIS 120 or CIS 124) and CIS 131.

Provides broad overview of the skills necessary for a systems analyst, consultant or project manager to work as an independent contractor or as part of an IT department. Topics include information systems concepts and tools, goal setting, project management, working in teams, documentation and communication.

**CIS 279L Linux+ (4 Credits)**

**Recommended preparation:** CIS 179 or CIS 179L.

Follows the CompTIA Linux+ exam outcomes and competencies and is therefore 'vendor neutral'. While previous experience with other PC operating systems is expected, this course will prepare you to work as a Linux administrator, network support, network technician, and more. Students will understand the fundamentals of Linux technology, learn all areas of the Linux infrastructure, and demonstrate how to use vendor products and software.

**CIS 2790P Cybersecurity Operations (4 Credits)**

Prepares students for the work and requirements of creating and managing a security operations center. Prepares students for the Cisco 210-250 exam - Understanding Cisco Cybersecurity Fundamentals and includes responsibilities in establishing teams to monitor and respond to information security incidents.

**CIS 279SC Windows Server Configuration (4 Credits)**

**Prerequisites:** CIS 179 or CompTIA Network+ certification.

Prepares the student to plan and begin implementing the Microsoft server operating system in an enterprise environment. It includes the outcomes and hands-on experience required to build the knowledge and skills needed to pass the associated Microsoft IT professional certification.

**CIS 279SE Security+ (4 Credits)**

**Prerequisites:** CIS 179.

**Recommended preparation:** CIS 279L.

The course outcomes cover: network security; compliance and operational security; threats and vulnerabilities; application, data and host security; access control and identity management and cryptography. The material prepares students to pass the CompTIA Security+ certification. Security+ is an international, vendor-neutral certification.

**CIS 279SM Windows Server Management (4 Credits)**

**Prerequisites:** CIS 279SC.

Prepares the student to manage, maintain, and troubleshoot the Microsoft server operating system in an enterprise environment. It includes the outcomes and hands-on experience required to build the knowledge and skills needed to pass the associated Microsoft IT professional certification.

**CIS 279SS Windows Server Services (4 Credits)**

**Prerequisites:** CIS279SM.

Prepares the student to plan, implement, maintain and troubleshoot Microsoft server operating system advanced services in an enterprise environment. It includes the outcomes and hands-on experience required to build the knowledge and skills needed to pass the associated Microsoft IT professional certification.

**CIS 279WC Windows Client (4 Credits)**

**Recommended preparation:** CIS 179.

This course prepares the student to plan, implement and manage the Microsoft Windows operating system in an enterprise environment. It includes the outcomes and hands-on experience required to build the knowledge and skills needed to pass the associated Microsoft IT professional certification.

**CIS 280 Co-op Work Experience CIS (1-3 Credits)**

**Prerequisites:** instructor approval.

A learning strategy designed to enhance students' knowledge, personal development, professional development and professional preparation by integrating academic study with practical experience. Students complete on-the-job training in a computer environment (requires a minimum of 33 clock hours of work for each credit hour earned). P/NP grading.

**CIS 284 Cisco CCNA Security (4 Credits)**

**Prerequisites:** CIS 154C or CCNA certification.

Introduces security related issues and provides essential skills network administrators need in order to provide security for a computer network. Covers protective security technologies including TCP packet analysis, network device hardening, advanced firewall techniques, cryptography, intrusion prevention systems, LAN security, virtual private networks, network attacks and mitigation techniques, and security policy planning.

**CIS 284EH Ethical Hacking (4 Credits)**

**Prerequisites:** CIS 279L.

**Recommended preparation:** CIS 151C, CIS 152C.

Preparation in network penetration testing methodologies in order to help businesses discover and mitigate security weaknesses, using the Linux and Windows operating systems. Learn security related topics such as: firewalls, intrusion detection systems, vulnerability scanners, packet sniffing, port scanning, cryptography, log analysis, web application attacks, exploitation tools, scripting languages, the Metasploit framework, VPNs, SSL, port redirection, security policies, compliance regulations, and professional code of conduct.

**CIS 288 Special Studies II (1-4 Credits)**

Explores topics of current interest in the discipline. P/NP grading.

**CIS 295 Web Development II (4 Credits)**

**Recommended preparation:** CIS 195.

Gain a deeper understanding of HTML (for structure) and CSS (for style) while creating multi-page websites suitable for businesses and organizations. Explore web development's more advanced techniques useful for improving usability and user experience. Plan and design websites for desktop and mobile users.

**CIS 297 CIS Professional Capstone (4 Credits)**

**Prerequisites with concurrency:** CIS 244.

This course addresses knowledge, skills and outcomes useful to IT professionals in a variety of disciplines. Students will explore and acquire job exploration skills, including interview skills, search skills, and resume-building skills to optimize job market opportunities. An integrated approach is used to combine project design components relative to job goals and capstone activities to assist in entering the job market with an array of job and technical analysis and design skills. The CIS capstone course is expected to be taken in a degree-seeking student's last term.

**CIS 298 Independent Study: CIS (1-4 Credits)**

**Prerequisites:** instructor approval.

**Recommended preparation:** prior coursework in the discipline.

Individualized, advanced study to focus on outcomes not addressed in existing courses or of special interest to a student. P/NP grading.

**CIS 299 Selected Topics: CIS (1-7 Credits)**

This course is in development.

**CS 160 Computer Science Orientation (4 Credits)**

**Prerequisites with concurrency:** MTH 111 or higher.

**Recommended preparation:** CIS 120 or CIS 124.

Provides a broad overview of the discipline of computer science. Learn the foundations of computer science such as problem solving and algorithms, programming concepts, and computer hardware. Research careers available in computer science, pathways to computer careers, and reflect on some of the influences computers have had and continue to have on society. Write programs in a variety of programming languages.

**CS 161 Computer Science I (4 Credits)**

**Prerequisites:** MTH 112 or MTH 251.

**Recommended preparation:** CS 160.

Examines the nature of computer programming; includes discussion of a computer model, methods of problem solving and programming structures; information representation; algorithm construction; object-oriented design using C++.

**CS 162 Computer Science II (4 Credits)**

**Prerequisites:** CS 161.

**Prerequisites with concurrency:** MTH 231.

Emphasizes the development of data structures, algorithm analysis, recursion, and sorting. Also explores several basic programming constructs, inheritance, interfaces, exceptions, and files/streams. Covers software engineering methods, proper program development, and attention to program planning and documentation.

**CS 188 Special Studies: Computer Science (1-4 Credits)**

Explores topics of current interest in the computer science discipline.

**CS 199 Selected Topics: Computer Science (1-4 Credits)**

Provides a learning experience in computer science not currently available; this course is in development to be proposed as a permanent course.

**CS 260 Data Structures (4 Credits)**

**Prerequisites:** CS 162 and MTH 231.

Covers general-purpose data structures and algorithms, software engineering of these structures, and the application of these engineering concepts to real world problems. Topics covered include managing complexity, complexity analysis, stacks, queues, lists, trees, heaps, hash tables, sets, maps, and graphs.

**CS 288 Special Studies: Computer Science (1-4 Credits)**

Explores topics of current interest in the computer science discipline.

**CS 298 Independent Study: Computer Science (1-4 Credits)**

**Prerequisites:** Instructor approval required.

**Recommended preparation:** Prior coursework in the discipline.

Individualized, advanced study in computer science to focus on outcomes not addressed in existing courses or of special interest to a student. P/NP grading.

**CS 299 Selected Topics: Computer Science (1-4 Credits)**

Provides a learning experience in computer science not currently available; this course is in development to be proposed as a permanent course.