# COMPUTER INFORMATION SYSTEMS (CIS)

**CIS 014A    Internet Principles and Protocols    3 Units**
Students will study the principles and protocols of the Internet. Students learn methods used to move data from one location to another over the Internet including TCP/IP, Internet security, routing, DHCP, DNS, and VPN.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 017A    Windows    3 Units**
Students acquire skills installing, planning, implementing, configuring and maintaining the Windows operating system. Students are introduced to remote desktop and virtual mode, printing, managing data storage, network services, speech recognition, remote access services, and network monitoring. The course also includes information on virtualization support, backup and data recovery, and managing system reliability and availability.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 041 or equivalent
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 017B    Windows Server    3 Units**
Students will acquire skills installing, planning, implementing, configuring and maintaining the Windows Server operating system. Students are introduced to Active Directory and account management, printing, managing data storage, network services, deploying Internet Information Server (IIS) services and Certificate Authority, remote access services, server and network monitoring. The course also includes information on virtualization, application services, data provisioning, backup and data recovery, and managing system reliability and availability.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 017A with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 017C    Microsoft Windows Server Active Directory    3 Units**
Students will learn various aspects of planning, implementing, configuring, and maintaining Microsoft Windows Active Directory infrastructure. Students will acquire skills of active directory design and security concepts, account management, and group policy configuration. Students will also learn new features of Windows Active Directory such as active directory federation services, active directory certificate services, and read only domain controllers.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 017B with C or better
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 017D    Microsoft Windows Server Network Infrastructure    3 Units**
Students will acquire in-depth knowledge of Windows Server, TCP/IP networking, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), Active Directory Domain services, file services, printers and print services, network policy and access service, security, and managing the Windows server network infrastructure.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 017B with C or better
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 018A    CCNAv7: Introduction to Networks    3 Units**
This is the first of three courses for the Cisco Certified Network Associate (CCNAv7) Program. Students are introduced to the fundamentals of networking concepts and technologies. Students acquire the skills necessary to plan and implement small networks across a range of applications. Topics include the OSI model and industry standards, network topologies, IP addressing, IPv4, IPv6, subnet masks, networking components, and basic network design. Students will learn the architecture, structure, functions, and components of the Internet and other computer networks. Students achieve a basic understanding of how networks operate and how to build simple local area networks (LAN), perform basic configurations for routers and switches, and implement Internet Protocol (IP). (C-ID ITIS 150)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 041 or equivalent
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 018B     CCNAv7: Switching, Routing, and Wireless Essentials     3 Units**
Students acquire knowledge of how a router "learns" about remote networks and determines the best path to those networks. Students study topics including both static routing and dynamic routing protocols. Students acquire the skills necessary to plan and implement small networks using Cisco IP routers and basic switches.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 018A with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 018C     CCNAv7: Enterprise Networking, Security And Automation (ENSA)     3 Units**
Students learn the design of a Local Area Network (LAN) and prepare for the Cisco Certified Network Associate (CCNA) test. Students will design and configure an actual network for a typical LAN. Topics covered include IPX addresses and access lists, advantages of LAN segmentation using bridges, routers, and switches. The course also covers features and benefits of Fast Ethernet connections and Virtual Local Area Networks (VLANs). (The course is a part of the CISCO Academy.)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 018B with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 018D     CCNA R&S: Connecting Networks     3 Units**
Students acquire knowledge of (Wide Area Network) WAN technology used to provide network access to resources across large geographical locations. Students study topics including network security and dynamic IP addressing services that are necessary to implement small networks for a range of applications. Students learn to implement WAN using Cisco networks.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: O
Prerequisite: CIS 018C with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 020     XML Fundamentals     3 Units**
Students will learn the essential concepts of XML technologies by creating XML documents, using Document Type Definitions (DTDs) and Schemas to validate XML documents, and creating their own DTDs and Schemas thereby defining the rulebook for the structure and content of XML documents. Students will also learn the basics of XPath to locate and extract content from an XML data file, use XLink and XPointer to link content, use SVG to create graphics and icons using XML, and the basics of XSL to transform an XML document into other types of objects, such as web pages, computer scripts, emails, and books. Students will also learn how to use Cascading Style Sheets (CSS) to render XML documents using nothing but a text editor and a web browser.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 020A     Advanced XML     3 Units**
Students will increase their knowledge and expertise in the essential concepts of XML technologies. Students will experience an in-depth deep dive into DTDs and Schemas to validate and analyze programmatically the structure of XML data. Students will learn the basics of computer programming, and build XML parsers to process and analyze XML files. Using XSLT, students will convert XML files into other files, such as computer scripts, and will build RESTful web applications using XML, PHP, and APIs.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 020 or equivalent
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 022     Database Technology     3 Units**
Students will learn how to create a database, implement using SQL (Structured Query Language), and create access to the Internet. Students will study database concepts, structure, access methods, and design considerations. The class will focus on object-relational databases.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: Completion of CIS 041 or equivalent.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 023     JavaScript Programming     3 Units**
Students will study how to use JavaScript to create dynamic web pages, and how to add animation and interactivity to make Web pages come alive. Students will learn how to use Document Object Model (DOM), Browser Object Model (BOM), and Dynamic HTML (DHTML) to be able to develop well-formed web pages.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 041
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 023A    Advanced JavaScript Programming    3 Units**
Students will learn advanced JavaScript techniques to develop code for real applications. Topics include forms, validation, cookies, hierarchical menus, XML, security, style sheets, browsers, and DOM (Document Object Model) programming.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 024A    Perl Programming    3 Units**
Students will study Perl, the leading web-server dynamic language used in the industry. Knowledge of Perl will prepare students to use this leading web technology to develop, create, and maintain industry-standard web sites across all computing platforms.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 024B    PHP Programming    3 Units**
Students will be introduced to the discipline of computer science using the high-level programming language PHP. Students will learn how to write PHP computer scripts to solve practical real-world problems. Students will develop, create, and maintain industry-class web sites using PHP. Topics include mixing PHP and HTML, and building web pages and web sites.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 041 and CIS 106.
Advisory Level: Read: 4 Write: 4 Math: None
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 024C    Python Programming    3 Units**
Students will be introduced to the discipline of computer science using the high-level programming language Python. Students will learn how to write Python computer programs to solve practical real-world problems. (C-ID COMP 122)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 041 and CIS 106
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 025C    Advanced Python Programming    3 Units**
Students will learn Python's advanced language constructs. Using these and several key libraries, students will write efficient software in Python to solve practical real-world problems. Students will write software using Python to solve practical real-world problems.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 036    Web 2.0 Programming    3 Units**
Students learn to use and integrate the technologies that form the foundation of Web 2.0 to produce rich web applications such as podcasts, blogging tools, XML, HTML, HTTP, and user interface.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 037    SQL Fundamentals    3 Units**
Students learn and apply SQL (Structured Query Language), to access and manipulate relational databases. Topics include simple and multiple queries, database creation, dynamic and embedded SQL, and data warehousing. (C-ID COMP 142)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 038    Programming the Mobile Web    3 Units**
Students learn to create effective and rich application experiences for mobile web browsers. Students also learn how to create offline applications that will be installed in the mobile device.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 041    Introduction to Computer Information Systems    3 Units**
Students will learn basic computer concepts with an emphasis on both the personal computer and enterprise computing. Students cover topics including hardware, application and system software, the internet and World Wide Web, communications, e-commerce, societal issues, database management, systems analysis and design, programming, information systems, career opportunities, certifications in the computer field, and computer trends. Student get hands-on practice of introductory level skills in word processing, spreadsheets, database, presentation graphics, and use of the internet. Students will be exposed to a programming language. (C-ID ITIS 120)

Lecture Hours: 3  Lab Hours: 1  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 2
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 047    Introduction to Web Development    3 Units**
Students will study how to manage and maintain industry-class websites. Students will study the basics of open-source web-server (Apache). Students will gain knowledge to use and implement the most widely used open-source server-side scripting language (PHP) along with the most popular open-source relational database (MySQL).

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 054    C/C++ Programming    3 Units**
Students will study C, a general-purpose programming language that features brevity of expression, modern control flow and data structures, and a rich set of operators. Students will also study C++, an object oriented programming language that is built using the C language as a base. Students will learn the importance of portability and efficiency through a variety of programming assignments. This course includes application programs and/or systems software. (C-ID COMP 122)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 041 and CIS 106
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 055    Data Structures: Programming    3 Units**
Students will learn a language-independent treatment of topics including computer organization, data formats, recursion, and abstract data types. Data structures covered include abstract data types, arrays, pointers, link lists, stacks, queues, trees, heaps, hash tables, and graphs. Applications of recursion algorithms are discussed in detail. Techniques for sorting algorithms and searching algorithms, as well as measuring algorithm performance and data structure efficiency using Big-O notation, are presented. (C-ID COMP 132)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 024B or CIS 024C or CIS 054 or CIS 084, all with C or better
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 059    Object Oriented Design and Programming    3 Units**
Students will learn the fundamentals and techniques of Object Oriented Programming (OOP). Topics covered include the elements of OOP, classes and objects, inheritance, polymorphism, overloading, overriding, member functions, member access, virtual functions, constructors, derived classes, dynamic objects, and exception handling. Modern programming and debugging techniques will be stressed throughout the course. Design Patterns and UML will also be introduced.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 054 or CIS 084 both with C or better
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 060    Systems Analysis and Design    3 Units**
Students apply the concepts of the systems analysis development cycle which includes problem definition; data collection, and analysis, analysis of system alternatives, determination of feasibility, development of the system proposal, pilot or prototype systems development, systems design, program development, systems implementation, systems review, and evaluation.

Lecture Hours: 3  Lab Hours: None  Repeatable: No  Grading: L
Recommended: CIS 041 or equivalent
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 062A    Introduction to PC Hardware and Diagnostics    2 Units**
Students will acquire basic hands-on skills to operate and support today's personal computer (PC) hardware. Students study the hardware architecture and major components of the PC including diagnostic tests, processors, motherboards, memory, storage devices, peripherals, and video. This class is the first step towards acquiring the skills needed for the CompTia A+ certification.

Lecture Hours: 1.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 2
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 062B    A+ PC Hardware Technology    2 Units**
Students will acquire the hands-on skills needed to diagnose hardware problems, configure PC components, and replace defective computer parts. Students learn how to install boards, configure multiple hard drives, add peripheral devices, work with network adapters, solve basic printer problems, and modify CMOS setups. Other topics include diagnostic software, hardware procedures, virtualization and hard drive imaging. This class prepares students for the current CompTia A+ certification exams.

Lecture Hours: 1.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 062A with C or better
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 062C    A+ Core PC Operating Systems Technology    2 Units**
Students will acquire skills to diagnose, load and setup a wide array of operating systems. Topics include the use of the command prompt, essential utilities, boot files, file systems, OS installation procedures, Windows configuration, hard disk partitioning, backup, and disaster recovery. The Cloud, Virtualization, and hard disk imaging solutions will be discussed. This class prepares students for CompTIA's A+ certification exams.

Lecture Hours: 1.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 062A with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 068     Administering Microsoft SQL Server     3 Units**
Students acquire skills needed to install and upgrade Microsoft SQL database. Topics include database storage configuration, database backup and restore, data security, disaster recovery, data replication, high availability, and troubleshooting. Students apply effective data management and administration of SQL data environment.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 017B with C or better
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 073     Visual Basic Programming     3 Units**
Students will learn to use Visual Basic .NET concepts, tools, and programming methodology to create user friendly Microsoft Windows applications. Visual Basic is a programming language that allows rapid development of the Microsoft Windows graphical user interface.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 2
Transfer Status: CSU/UC     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 084     Java Programming     3 Units**
Students will be introduced to the discipline of computer science using the high-level programming language Java. Students will learn how to write Java computer programs to solve practical real-world problems. Topics include problem solving, classes, variable passing, Graphical User Interface (GUI), input/output, Java libraries, applets, exception handling, data types, and data structures using an object-oriented approach. (C-ID COMP 122)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: Successful completion of CIS 041 and CIS 106.
Advisory level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU/UC     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 087     Computer Systems, Architecture, and Organization     3 Units**
This course covers the organization and behavior of real computer systems at the assembly-language level. The mapping of statements and constructs in a high-level language onto sequences of machine instructions is studied, as well as the internal representation of simple data types and structures. Numerical computation is examined, noting the various data representation errors and potential procedural errors.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: Experience comparable with the following courses: CIS 024B, CIS 024C, CIS 054, CIS 084. Experience comparable with Data Abstraction and Data Structures: CIS 055.
Advisory Level: Read: 3 Write: 3 Math: 4
Transfer Status: CSU/UC     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 098     Directed Study in Computer Information Systems     0.5-9 Units**
Individual or small groups of students who would benefit from Independent Study under the direction of faculty members in specific or related disciplines may develop individualized learning contracts designed to enhance their individual instructional programs. The students and the faculty member in consultation with the Division Dean will determine appropriate learning objectives and activities as well as the number of units to be earned. Instructions and the Learning Contract forms are available in the Division office. Repeatable to a maximum of 9 units across all disciplines.

Lecture Hours: None  Lab Hours: 2.07  Repeatable: Yes  Grading: O
Advisory Level: Read: 2 Write: 2 Math: None
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 106     Introduction to Coding and Python Programming     3 Units**
Students will learn to think algorithmically to create code and to solve programming problems. Topics include software development, principles of programming, programming errors, writing code, and algorithms. This course is ideal for students who are interested in learning the basics of how to become a computer scientist. The course's purpose is to expose students to the fundamental concepts of programming. (C-ID COMP 112)

Lecture Hours: 1.5  Lab Hours: 4.5  Repeatable: No  Grading: O
Recommended: Basic knowledge of computer usage
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU/UC     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 107     Technest 2: Data Science     3 Units**
As the second course in the Technest Coding Academy, students learn the three main factors of data science: inferential thinking, computational thinking, and real-world relevance. Topics include critical concepts and skills in computer programming and statistical inference, and the analysis of real-world datasets, as well as social issues surrounding data analysis such as privacy and design. This course is based on UC Berkeley's Data 8 course curriculum. Enrollment in this class is contingent upon acceptance into the Technest Coding Academy. Interested students will need to contact course instructor listed in the schedule of classes.

Lecture Hours: 1.5  Lab Hours: 4.5  Repeatable: No  Grading: O
Recommended: Successful completion of CIS 106, CIS 024A or similar Python programming experience is recommended. Students should visit the Technest webpage at http://www.sjcc.edu/home/technest or contact the course instructor for additional information.
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU/UC     Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 108    Technest 3: Internet of Things    3 Units**
As the third course in the Technest Coding Academy, students are exposed to the emerging platform called the Internet of Things (IoT). Topics include: exploration of the convergence of multiple disciplines leading to modern smartphones; exploring the emerging IoT platform, enabling unprecedented, innovative products and services; learn how information from physical devices in the real world gets communicated to smartphone processors; interfacing common sensors and actuators to hardware; developing software to acquire sensory data, process the data and actuate stepper motors, LEDs, etc. for use in mobile-enabled products.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: O
Prerequisite: Successful completion of the assessment exercises must be done before student can enroll; Recommended: Successful completion of CIS 106, CIS 024A or similar Python programming experience. Students should visit the Technest webpage at http://www.sjcc.edu/home/technest or contact the course instructor for additional information.
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU/UC     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 111    Introduction to Cybersecurity    1.5 Units**
Students will learn basic information security (cybersecurity) concepts with an emphasis on both the personal computer and enterprise computing. Students cover topics including hardware, application and system software, the internet and World Wide Web, communications, e-commerce, societal issues, database management, systems analysis and design, programming, information systems, career opportunities.

Lecture Hours: 1.5  Lab Hours: None  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 2
Transfer Status: None     Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

Credit by Exam: Yes

**CIS 120    Fundamentals of Business & Data Analytics    3 Units**
This course is the first in a four-part series and is designed to introduce students to the fundamentals of Business and Data Analytics. It aims to develop students' understanding of analytics in the context of a business and to provide a framework for students to apply topics such as: framing a business problem, stakeholder analysis, data wrangling using Google Sheets, data visualizations, descriptive statistics, exploratory data analysis, and data storytelling in business. In this course students will learn how to clean, visualize, analyze, and communicate data insights to stakeholders. This course culminates in a hands-on final project in which students will perform an end-to-end exploratory data analysis (EDA) using real industry data. This course has been developed by Pathstream and is part of the Business & Data Analytics Certificate in collaboration with Tableau & Silicon Valley Bank.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: Completion of CIS 041.
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 122    SQL for Data Analytics    3 Units**
This course is the second in a four-part series and is designed to introduce students to the fundamentals of Business and Data Analytics. Students will be introduced to Structured Query Language (SQL) and will learn to identify the role and structure of relational databases as they apply to data analytics, apply the Structured Query Language (SQL) in MySQL for data manipulation language (DML), apply the Structured Query Language (SQL) in MySQL for data definition language (DDL), and apply normal forms (1NF, 2NF, & 3NF) for database normalization. This course has been developed by Pathstream and is part of the Business & Data Analytics Certificate in collaboration with Tableau & Silicon Valley Bank.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 123    Data Visualization With Tableau    3 Units**
This course is the third in a four-part series focused on Business / Data Analytics and is designed for community college students. In this course, students will explore the role and application of data visualization in the data analysis process using Tableau. They will create and design both static and dynamic tables, data visualizations, dashboards, and stories while incorporating visual design best practices to better communicate insights to intended audience, such as business stakeholders. Students will also connect multiple external data sources (e.g., Text Files, Excel, SQL databases) to Tableau and optimize large data to efficiently wrangle and analyze real-industry data. The course is focused on project-based learning and prepares students for the skills identified in the Tableau Desktop Specialist certification. Pathstream has built this course in partnership with Silicon Valley Bank and Tableau.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: CIS 120 and CIS 122
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 124    Utilizing Statistics for Data Analytics    3 Units**
This course is the fourth in a four-part series focused on business / data analytics, and aimed at community college students who have little or no background in business or analytics. The first three courses in the series are not necessarily prerequisites for this course, but a basic familiarity with data and spreadsheets is assumed. The course is focused on project-based learning using Google Sheets and Python to apply basic statistical techniques to data.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Recommended: Previous completion of CIS 120, CIS 122, and CIS 123 or equivalent experience.
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: CSU     Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 132    Creating Web Pages with HTML and CSS    3 Units**
Cascading Style Sheets (CSS) and HTML are the foundation languages of all web development. Whether your website is built using a content management system like WordPress, Drupal, or Joomla!, or a WYSIWYG tool like Dreamweaver, becoming fluent in these two languages is critical to the development of top-notch websites. In this introductory course, students will learn the fundamentals of coding, publishing, and putting together of web pages into web sites. Students will learn in this introductory course, the fundamentals of coding, publishing, and compiling web pages into websites. They will gain knowledge and use Cascading Style Sheets (CSS) and HTML languages.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 138    Work Experience    1-8 Units**
Work Experience is designed for students who work or volunteer in a field related to their career major. Students are required to provide evidence that they are enrolled in a career program (e.g., education plan or coursework in a career/technical subject area). Students can earn one unit of credit for each 60 hours of unpaid volunteer time or 75 hours of paid work during the semester. Students can repeat Career/Technical Work Experience, combined with General Work Experience, or alone, up to a maximum of 16 units. Internship/job placement is not guaranteed.

Lecture Hours: None  Lab Hours: 2.07  Repeatable: Yes  Grading: O
Corequisite: Be employed or a volunteer at an approved work-site for the minimum number of hours per unit as stipulated for paid and unpaid status.
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 140    IT Technical Support Fundamentals    2 Units**
This course is the first of a series that aims to prepare students for a role as an entry-level IT Support Specialist. In this course, students will be introduced to the world of Information Technology, or IT. Students will learn about the different facets of Information Technology. Topics will include: an introduction to computer hardware, the Internet and security, managing computer software, networking and security, understanding operating systems and how to install them, troubleshooting, and customer service.

Lecture Hours: 1.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 2 Write: 2 Math: 2
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 141    The Bits and Bytes of Computer Networking    2 Units**
This course is part of a series that aims to prepare students for a role as an entry-level IT Support Specialist. In this course, students will learn a full overview of Computer Networking. Topics will include: the fundamentals of modern networking technologies and protocols to an overview of the cloud to practical applications and network troubleshooting.

Lecture Hours: 1.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 142    Operating Systems and Becoming a Power User    2 Units**
This course is part of a series that aims to prepare students for a role as an entry-level IT Support Specialist. In this course, students will learn about the main components of an operating system (Windows, Linux OS, etc.) and how to perform critical tasks like managing software and users and configuring hardware.

Lecture Hours: 1.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 140 with C or better
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 143    System Administration and IT Infrastructure Services    3 Units**
This course is part of a series that aims to prepare students for a role as an entry-level IT Support Specialist. In this course, students will learn infrastructure services that keep all organizations, big and small, up and running, typical cloud infrastructure setups and how to manage cloud resources, how to manage and configure servers and how to use industry tools to manage computers, user information, and user productivity, and how to recover your organization's IT infrastructure in the event of a disaster.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 144    IT Security: Defense Against the Digital Dark Arts    3 Units**
This course is part of a series that aims to prepare students for a role as an entry-level IT Support Specialist. In this course, students will learn about IT security concepts, tools, and best practices. Topics will include: the manner in which threats and attacks manifest, an overview of encryption algorithms and how they're used to safeguard data, the three As of information security (authentication, authorization, and accounting), network security solutions ranging from firewalls to Wifi encryption options, and a multi-layered, in-depth understanding of security architecture followed by recommendations on how to integrate a culture of security into your organization or team.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: 3
Transfer Status: None    Degree Applicable: AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 157    Introduction to Unix/Linux    3 Units**
Students are introduced to the Unix/Linux operating systems. Topics covered include a basic editor, shells, directory and file structure, file permissions, passwords, security, redirection, pipes, filters, regular expressions and shell programming. Additional topics include the use of I/O devices, Internet access, and an introduction to system administration.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU/UC    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 158    Linux System Administration    3 Units**
Students study the concepts of Linux system administration. Topics include Linux installation, Unix/Linux file systems, managing user accounts, user shells, security, system resources, system and file backup and restore, printers and print spooling systems, TCP/IP network configuration and/or management, network access using telnet and ftp, ssh (secure shell), interface to networks using NFS 3 and SAMBA, electronic mail systems, system kernel builds, and system tuning. Students use shell scripts to demonstrate system administration.

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 157 with C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 160    Introduction to Information Systems Security    3 Units**
Students are introduced to the fundamental principles and topics of Information Technology Security and Risk Management at the organizational level. They will gain knowledge in hardware, software, processes, communications, applications, and policies and procedures with respect to organizational Cybersecurity and Risk Management. This course prepares students for the CompTIA Security certification exams. (C-ID ITIS 160)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 014A with a C or better
Advisory Level: Read: 3 Write: 3 Math: None
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

Credit by Exam: Yes

**CIS 164    Introduction to Cybersecurity: Ethical Hacking    3 Units**
Students will be introduced to the various methodologies for attacking a network. They will learn the concepts, principles, and techniques, as well as gain supplemental hands-on experience attacking and disabling a network within the context of properly securing a network. The course will emphasize network attack methodologies with the emphasis on student use of network attack techniques and tools, and appropriate defenses and countermeasures. Students will receive course content information through a variety of methods including lectures and demonstration of hacking tools in addition to a virtual environment. (C-ID ITIS 164)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: Take CIS 160; with a C or better.
Advisory Level: Read: 3 Write: 3 Math: 2
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 165    Digital Forensics Fundamentals    3 Units**
Students will be introduced to the methods used to properly conduct a digital forensics investigation beginning with a discussion of ethics, while mapping to the objectives of the International Association of Computer Investigative Specialists (IACIS) certification. Topics covered include an overview of computer forensics as a profession; the computer investigation process; understanding operating systems boot processes and disk structures; data acquisition and analysis; technical writing; and a review of familiar digital forensics tools. (C-ID ITIS 165)

Lecture Hours: 2.5  Lab Hours: 1.5  Repeatable: No  Grading: L
Prerequisite: CIS 160 with C or better
Advisory Level: Read: 3 Write: 3 Math: 2
Transfer Status: CSU    Degree Applicable: AA/AS
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.

**CIS 500    Troubleshooting and Repairing iOS/iPhone and Android Mobile Devices    0 Units**
Students will learn how to troubleshoot, find faults, and to repair iOS/iPhone and Android mobile cell phones. Cell phone repair is a service that is growing exponentially and is in constant demand. Due to the complexity of technology it needs skilled and knowledgeable technicians to provide necessary repairs. This short course is designed to teach students how to troubleshoot, find faults, and to repair mobile devices.

Lecture Hours: 0.5  Lab Hours: 1.5  Repeatable: Yes  Grading: N
Transfer Status: None    Degree Applicable: NC
For General Education (GE) information, please refer to assist.org (https://assist.org) or consult a counselor.