

COMPUTER AND INFORMATION SCIENCES (CMIS)

CMIS 101 - Information Systems and Technology (3)

Gen Ed Computer Literacy

Prerequisites: ENGL 70 or ENGL 75 or (ESOL 72 and ESOL 73) or ESOL 100 OR Co-requisite: ENGL 75 or ESOL 100

(formerly CIS 101)

Explores the fundamentals of information systems and relevant technologies. This course surveys the terminologies, types, components, functions, architectures, and development life cycle of information systems. Topics include roles, values, impacts, applications, security concerns, social issues, ethics, and responsibilities related to the use of information systems in businesses. Students also learn productivity applications, such as word processing, spreadsheet, presentation, and database software.

CMIS 105 - Introduction to Programming (2)

Prerequisites: ENGL 70 or ENGL 75 or (ESOL 72 and ESOL 73) or ESOL 100 OR Co-requisite: ENGL 75 or ESOL 100

(formerly CIS 107)

Introduces programming and is aimed at students with no prior programming knowledge or skills. Covers basics of programming including variables, decision-making statements, and iterative statements. Students create logical solutions to novel problems using tools such as pseudocode and flowchart. Students write, test, and run elementary programs to solve problems using a high-level programming language.

CMIS 106 - Object Design and Programming (3)

Gen Ed Computer Literacy

Prerequisites: ENGL 70 or ENGL 75 or (ESOL 72 and ESOL 73) or ESOL 100 AND Prerequisite or Co-requisite: Any 100 level MATH course or higher or appropriate score on mathematics placement test

(formerly CIS 106)

Covers basics of object-oriented programming, fundamentals of computer information systems, impact of information technology on the economic, political and cultural development of society as well as the ethical, societal, and legal aspects of information technology. Students will design, implement, document, and debug object-oriented programs to solve problems by utilizing various data types and algorithms, control structures, encapsulation, and inheritance. Students will participate in structured walkthroughs and discussions, create Unified Modeling Language (UML) diagrams in designing solutions, and debug errors within the designed solutions. Requires no prior programming experience.

CMIS 111 - Microcomputer Software Applications (3)

(formerly CIS 111)

A series of individual courses involving various state-of-the-art microcomputer software application packages.

CMIS 111B - Database (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106
(formerly CIS 111B)

Covers the basic and advanced features of a commercial database software package. Students plan, define and use a database; perform queries; produce reports and forms; work with multiple files; and learn the basic concepts of database programming.

CMIS 111J - Web Page Development (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106
(formerly CIS 111J)

Introduces modern web development tools for website construction. This course covers the topics relevant to the development of interactive websites, including conceptualization, design, layout, and visual stimulation. Students will learn HTML5, CSS3, and JavaScript.

CMIS 111L - UNIX/Linux Operating System (3)

Prerequisite or Co-requisite: (CMIS 105 or CIS 107) or CMIS 106 or (CMIS 120 or CIS 111M)

(formerly CIS 111L)

Explores the practical use and operation of an open-source operating system (Linux/Unix). Students will learn how to use basic Unix commands, shell scripting, and various system utilities.

CMIS 111R - Business Software Applications (3)

(formerly CIS 111R)

Emphasizes an integrated approach. Covers different software applications, from spreadsheet to word processor, to graphs, to the file manager, to communication files. Provides numerous hands-on assignments and exercises. Students gain practical experience using a computer to solve problems that arise in the automated office environment.

CMIS 111S - Social Media Tools (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106 or (CMIS 120 or CIS 111M)

(formerly CIS 111S)

Explores social media tools, social media marketing tools, and social media monitoring tools. Covers both well-established and emerging social media tools as well as their applications for measuring, leveraging, and optimizing digital media content. Students learn to implement social campaigns or marketing initiatives using social media, manage social media, and monitor social media channels.

CMIS 111T - Digital Marketing (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106 or (CMIS 120 or CIS 111M)

(formerly CIS 111T)

Introduces the digital marketing communications landscape, channels, and technology. Topics include online advertising campaigns utilizing the web technologies such as Email marketing, YouTube marketing, and Facebook marketing. Students learn to create contextual marketing plans and establish digital analytics related to digital marketing and advertising.

CMIS 111V - Virtualization and Cloud Essentials (3)

Prerequisite or Co-requisite: CMIS 106 or (CMIS 105 or CIS 107) or (CMIS 120 or CIS 111M)

(formerly CIS 111V)

Surveys the virtualization technology and applications. Introduces the business value and impact of virtualization and cloud computing, essential characteristics of cloud computing, cloud technologies and applications, cloud computing architecture, and cloud service models as well as cloud adoption and deployment. Topics include virtualization concepts, virtualization infrastructure, virtualization in cloud environment, business and technical perspective of cloud computing, cloud models, cloud economics, cloud computing services, and application as well as adoption and deployment of cloud computing. Covers the objectives of Amazon Web Services (AWS) Certified Cloud Practitioner exam and CompTIA Cloud Essentials certification exam.

CMIS 117 - Data Science Essentials (3)

Prerequisite: ENGL 70 or (ESOL 70 and ESOL 71) OR Prerequisites or Co-requisites: ENGL 75 or ESOL 100

(formerly CIS 117)

Introduces concepts and techniques of data collection and discovery as well as computer based data analysis tools. Surveys data wrangling, data journalism, data visualization, big data analytics, and data engineering technologies, such as Hadoop and MapReduce. Topics include the data organization and repository, data science process, inductive data-driven modeling, statistical inference, logistic regression, and exploratory data analysis.

CMIS 118 - Data Analytics Using Spreadsheets (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106 or CMIS 111E or CMIS 111R

(formerly CIS 118)

Covers the theory and techniques of data modeling and data analysis using spreadsheets. Students learn to summarize data, explore data, produce accumulated data, and visualize data by utilizing spreadsheet software, such as MS Excel.

CMIS 119 - Statistical Analysis System (SAS) (3)

Prerequisite or Co-requisite: (CMIS 105 or CIS 107) or CMIS 106

(formerly CIS 119)

Covers the point-and-click interactive SAS Studio and basics of SAS programming. Students utilize SAS Studio to visualize and summarize data by creating reports, charts, and graphs as well as conduct statistical tests and analysis. Students also learn SAS programming capabilities necessary to process data from a variety of sources and to solve problems.

CMIS 120 - PC Operating Systems (3)

Prerequisite or Co-requisite: CMIS 121 or CIS 212

(formerly CIS 111M)

Explores the installation, configuration, and operations of operating systems. Students learn to set up, configure, troubleshoot, and maintain hardware devices and software applications on an operating system. Covers the objectives of CompTIA A+ certification exam. It is required that students take this course and CMIS 121 PC Repair & Diagnostics in the same semester.

CMIS 121 - PC Repair & Diagnostics (3)

Prerequisite or Co-requisite: CMIS 120 or CIS 111M

(formerly CIS 212)

Introduces diagnosis and troubleshooting of personal computers. This course covers the hardware and software troubleshooting techniques, including diagnosis software, board replacement, storage, and memory troubleshooting. Covers the objectives of CompTIA A+ certification exam. It is required that students take this course and CMIS 120 PC Operating Systems in the same semester.

CMIS 140 - Java Programming (3)

Prerequisite or Co-requisite: CMIS 106

(formerly CIS 140)

Introduces Java programming language with an emphasis on object-oriented principles. Students utilize library classes in developing Java standalone applications and applets. Topics include Graphical User Interface (GUI) programming, event-driven programming, inheritance, and polymorphism.

CMIS 173 - Healthcare Information Technology (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106 or (CMIS 120 or CIS 111M)

(formerly CIS 173)

Prepares students to become healthcare information technology technicians. Topics covered include healthcare-related regulatory requirements, healthcare terminology/acronyms, medical business operations, electronic health records (EHRs), and healthcare specific security best practices. Students will obtain the knowledge and skills required to implement, deploy, and support health IT systems in medical facilities.

CMIS 175 - Game Theory and Design (3)

Prerequisites: ENGL 70 or ENGL 75 or (ESOL 72 and ESOL 73) or ESOL 100

(formerly CIS 175)

Covers game theory and design. Topics include the roles of game designers, game structures and elements as well as game development stages and methods. Students learn about designing, prototyping, and playtesting games.

CMIS 176 - Game Creation (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106 or CMIS 175

(formerly CIS 176)

Covers the creation of basic games. This hands-on course guides students step by step through the basics of building interactive games. Students learn to create computer games utilizing current technologies, such as web page design/development languages, animation/simulation software, and game engines.

CMIS 177 - Interactive 3D Technology (3)

Prerequisite or Co-requisite: CMIS 101 or (CMIS 105 or CIS 107) or CMIS 106 (formerly CIS 177)

Surveys the current 3 dimensional (3D) technologies and introduces the design and creation of virtual interactive 3D models. Covered techniques include mesh modeling, texturing, lighting, rigging, animating, and rendering. Students learn to design and develop computer generated interactive 3D worlds using 3D production tools such as Blender.

CMIS 178 - 3D Modeling and Animation (3)

Prerequisite or Co-requisite: CMIS 177

(formerly CIS 178)

Introduces fundamentals of creating and animating 3 dimensional (3D) computer modeling. The industry standard 3D modeling and animation software are surveyed and explored. This course covers Autodesk Maya Certified Professional exam topics and objectives. Topics include 3D modeling concepts and 3D animation process. Students learn to create and animate 3D models using 3D modeling tools.

CMIS 179 - Cybersecurity Fundamentals (3)

Prerequisites: ENGL 70 or ENGL 75 or (ESOL 72 and ESOL 73) or ESOL 100 OR Co-requisite: ENGL 75 or ESOL 100

(formerly CIS 179)

Surveys cybersecurity concepts and practices including malware, anti-malware, social engineering, information privacy, data security, and security policies. Students learn to identify cyber threats, threat sources, and threat mitigations as well as protect them from Internet predators. Students will be able to evaluate security policies and procedures.

CMIS 200 - IT Support Services (3)

Prerequisite or Co-requisite: (CMIS 120 or CIS 111M) or (CMIS 121 or CIS 212)

(formerly CIS 200)

Introduces the fundamentals, operations, roles, and responsibilities of information technology (IT) support services. Students practice problem-solving and communication skills appropriate in the computer user-support environment. Best practices in customer support and professional work habits are emphasized throughout the course. Topics include incident identification, incident management, information collection skills, communication skills, personal skills, technical skills, security skills, troubleshooting skills, training skills, and business skills.

CMIS 201 - Computer Science I (4)

Prerequisite: (MA 81 or MATH 67 or MA 83 or MA 85 or appropriate score on mathematics placement test) and (Grade of C or better in CMIS 106)

(formerly CIS 201)

Emphasizes object-oriented design, data abstraction and programming beyond an introductory level. Introduces user interfaces and graphics through the study of object design. Emphasizes object-oriented software engineering including Unified Modeling Language (UML). Investigates fundamental sorting and searching algorithms, introductory dynamic data structures and event-driven programming techniques. Develops programming skills using a language that supports the object-oriented paradigm.

CMIS 202 - Computer Science II (4)

Prerequisite: Grade of C or better in CMIS 201

(formerly CIS 202)

Emphasizes algorithms, data structures, and object-oriented software engineering. Introduces algorithmic analysis including asymptotic notation, empirical performance measurements, and time/space tradeoffs. Covers fundamental computing algorithms including sorting, searching, and manipulating dynamic data structures, such as lists, stacks, queues, trees, graphs and hash tables. Investigates recursion including applications to algorithms and data structures. Integrates further software engineering concepts including data abstraction and participation in team programming projects. Projects will be completed using a language that supports the object-oriented paradigm (Java).

CMIS 203 - Systems Analysis & Design (3)

Prerequisite: CMIS 106

(formerly CIS 203)

Presents concepts of structured systems analysis and design techniques such as problem definition, cost analysis, charting and scheduling, implementation planning and documentation. Emphasizes project management, communication and analytical skills.

CMIS 204 - Computer & Information Sciences Project (3)

Prerequisite or Co-requisite: CMIS 203

(formerly CIS 204)

Assigns a project commensurate with student's background and training, and carries it through from system analysis and design to program preparation and implementation.

CMIS 208 - C++ Programming (3)

Prerequisite: CMIS 106

(formerly CIS 208)

Emphasizes object-oriented programming in C++. This course provides a comprehensive coverage of C++ features, including arrays, strings, pointers, references, classes, inheritance, polymorphism, function overloading, function overriding, virtual function, and template. Students learn to design and implement object-oriented programs in C++ programming language.

CMIS 217 - Cybercrime and Digital Forensics (3)

Prerequisite or Co-requisite: CMIS 111L or CMIS 111V or CMIS 120 or CIS 111M

(formerly CIS 217)

Covers the fundamentals of computer forensics, and the techniques and processes involved in identifying, collecting, preserving, and analyzing digital evidence. Surveys the contemporary crime and related legal issues and laws.

CMIS 218 - Information Security (3)

Prerequisite or Co-requisite: (CMIS 105 or CIS 107) or CMIS 106 or (CMIS 120 or CIS 111M)

(formerly CIS 218)

Covers the fundamentals of information security and assurance.

Topics include cryptography, security architecture and controls, risk management and governance, disaster recovery planning and management, as well as security frameworks, standards, and policies. Students learn to protect information systems from unauthorized access in order to ensure confidentiality, integrity, and availability.

CMIS 219 - Ethical Hacking (3)

Prerequisite or Co-requisite: CMIS 111L

(formerly CIS 219)

Covers the fundamentals of protecting information technology resources from cyber attacks. Students learn the tools and penetration testing methodologies used by ethical hackers, as well as the methods and tools to protect against attacks and vulnerabilities. Surveys computer crime-related laws and regulations.

CMIS 222 - Computer Organization (4)

Prerequisite: CMIS 106

(formerly CIS 222)

Introduces the organization and essential functions of computer systems. This course surveys the components of computer systems from the architecture point of view and provides an in-depth discussion on topics including central processor unit (CPU) structure, instruction sets, data representation, computer arithmetic, digital logic, memory architectures, and parallel processing. Students will also explore the support of operating systems from programming perspectives.

CMIS 225A - Computer Programming Language: PHP (3)

Prerequisite or Co-requisite: CMIS 106

(formerly CIS 225A)

Introduces programming using PHP.

CMIS 225C - Computer Programming Language: Mobile Applet Programming (3)

Prerequisite: CMIS 106

(formerly CIS 225C)

Introduces applet programming for mobile devices using the Android operating system.

CMIS 226 - Game Scripting (3)

Prerequisite or Co-requisite: (CMIS 105 or CIS 107) or CMIS 106

(formerly CIS 226)

Covers the development of computer games using a scripting language (Python). A current scripting language will be covered and used to develop game programs. Students learn to design and develop cross-platform computer games.

CMIS 227 - Game Programming (4)

Prerequisite: (CMIS 105 or CIS 107) or CMIS 106
(formerly CIS 227)

Covers the development of computer games using a high-level programming language. Introduces game development aspects and techniques through creation of computer programs. This course also surveys the modern game engines. Students learn to develop computer game programs for specific game engines and platforms.

CMIS 228 - Simulation and Game Development (4)

Prerequisite: (CMIS 105 or CIS 107) or CMIS 106 or CMIS 177 or CMIS 178
(formerly CIS 228)

Covers the development of digital interactive contents used in computer games and computerized simulations. This course introduces students to the current game engines and simulation software used to build comprehensive and interactive computer games and simulations.

CMIS 230 - Database Management Systems (3)

Prerequisite or Co-requisite: (CMIS 105 or CIS 107) or CMIS 106 or CMIS 111E or CMIS 119
(formerly CIS 230)

Provides an in-depth study of database management systems and the fundamentals of database design and development. Topics include Structure Query Language (SQL), normalization, integrity constraints, data models, and transaction control. Students design and develop databases and database applications utilizing database management systems (DBMS), such as Oracle or Microsoft SQL Server.

CMIS 256 - Statistical Computing (3)

Prerequisite or Co-requisite: (CMIS 105 or CIS 107) or CMIS 106 or CMIS 119
(formerly CIS 256)

Covers the R programming language and software development environment for statistical computing. Students learn to develop, test, and run programs in R. Students use the R system as a data science tool to process data, manipulate data, and create data science results.

CMIS 257 - Data Visualization (3)

Prerequisite: (CMIS 105 or CIS 107) or CMIS 106 or CMIS 118 or CMIS 119 or CMIS 256
(formerly CIS 257)

Covers the fundamentals and techniques of data visualization. Students learn to effectively communicate data by using data as a pivotal point in the presentation. Students obtain data visualization skills via hands-on activities using data analysis and visualization software tools, such as Tableau.

CMIS 258 - Data Wrangling (3)

Prerequisite: (CMIS 105 or CIS 107) or CMIS 106 or CMIS 118 or CMIS 119 or CMIS 256
(formerly CIS 258)

Surveys the concepts, needs, principles, and techniques of data wrangling. Explores data extraction, transformation, and loading (ETL) tools/systems. Students practice data wrangling activities including data extraction, data transformation, data loading, integrating data sources, and correcting erroneous/missing values by utilizing computer based tools.

CMIS 259 - Big Data Analytics (3)

Prerequisite: (CMIS 105 or CIS 107) or CMIS 106 or CMIS 118 or CMIS 119 or CMIS 256
(formerly CIS 259)

Surveys the roles, needs, challenges, principles, trends, platforms, analytic lifecycle/methods, and architectures/frameworks relevant to big data technology. Surveys big data analytics tools/systems, such as Hadoop, MapReduce, Talend, Apache Hive, Apache Pig, SAS, or R. Students apply learned concepts and techniques to solve problems by using big data analytics tools/systems.

CMIS 266 - Cloud System Administration (3)

Prerequisite or Co-requisite: CMIS 111V or CMIS 120 or CIS 111M
(formerly CIS 266)

Explores administering cloud platforms and deploying applications on cloud platforms. Students learn to operate, manage, monitor, and secure cloud computing systems such as Amazon Web Services (AWS), as well as deploy and scale applications in cloud environments. Covers the objectives of AWS Certified SysOps Administrator Associate exam.

CMIS 280 - Networking Fundamentals (3)

Prerequisite or Co-requisite: CMIS 120 or CIS 111M
(formerly CIS 180)

Reviews hardware, operating systems, and other networking principles. Includes comprehensive networking skill sets necessary for the CompTIA Network exam.

CMIS 281 - Security Fundamentals (3)

Prerequisite or Co-requisite: CMIS 280 or CIS 180
(formerly CIS 170)

Provides students with the knowledge and skills to implement, maintain and secure network services, network devices, and network traffic. Builds on foundational network concepts, computer hardware, and operating systems principles.

CMIS 290 - Cisco 1 Introduction to Networks (3)

Prerequisite or Co-requisite: CMIS 106 or (CMIS 120 or CIS 111M)
(formerly CIS 190)

Covers the architecture, structure, functions, and components of the Internet and other computer networks in accordance with CCNAv7: Introduction to Networks (ITN). 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).

CMIS 291 - Cisco 2 Switching, Routing, and Wireless Essentials (3)

Prerequisite or Co-requisite: CMIS 280 or CIS 180 or CMIS 290 or CIS 190
(formerly CIS 191)

Covers the architecture, components, and operations of routers and switches in small networks and introduces wireless local area networks (WLAN) and security concepts in accordance with CCNAv7: Switching, Routing, and Wireless Essentials (SRWE). Students learn how to configure and troubleshoot routers and switches for advanced functionality using security best practices and resolve common issues with protocols in both IPv4 and IPv6 networks.

CMIS 292 - Cisco 3 Enterprise Networking, Security, and Automation (3)

Prerequisite or Co-requisite: CMIS 291 or CIS 191

(formerly CIS 192)

Describes the architecture, components, operations, and security to scale for large, complex networks, including wide area network (WAN) technologies, in accordance with CCNAv7: Enterprise Networking, Security, and Automation (ENSA). The course emphasizes network security concepts and introduces network visualization and automation. Students learn how to configure, troubleshoot, and secure enterprise network devices and understand how application programming interfaces (API) and configuration management tools enable network automation.

CMIS 294 - Cybersecurity Operations (3)

Prerequisite or Co-requisite: CMIS 292

Introduces the core security concepts and skills needed to monitor, detect, analyze, and respond to cybercrime, cyberespionage, insider threats, advanced persistent threats, regulatory requirements, and other cybersecurity issues facing organizations in accordance with CCNA Cyber Ops. It emphasizes the practical application of the skills needed to maintain and ensure security operational readiness of secure networked systems.

CMIS 295 - Cloud Security (3)

Prerequisite or Co-requisite: CMIS 111V or CMIS 266 or (CMIS 280 or CIS 180) or (CMIS 290 or CIS 190)

(formerly CIS 223)

Covers the essentials of the cloud security technologies, mechanisms, and standards/frameworks as outlined by Cloud Security Alliance (CSA) and National Institute of Standards and Technology (NIST) Cloud Computing Security Standards. Surveys cloud governance, certification compliance, and accreditation. Students learn to analyze risk in cloud environments and cloud security solutions, create and secure public and private cloud instances, and secure cloud applications.