**COMPUTER INFORMATION SYSTEMS (2440)**

2440:105 Introduction to Computers and Application Software (3 Credits)
Overview of basic computer concepts, electronic mail and Internet terminologies. Introductory-level instruction and hands-on experience in word processing, spreadsheet, database and presentation software.

2440:121 Introduction of Logic/Programming (3 Credits)
Prerequisite: 2440:105 or placement test. An introduction to business problem solving using computer-based solutions. Topics include structured design, documentation and modularity. Includes a component of hands-on programming.

2440:125 Spreadsheet Software (2 Credits)
Prerequisite: 2440:105 or placement test. Emphasizes mastery of spreadsheet applications using Excel.

2440:140 Internet Tools (3 Credits)
Prerequisite: 2440:105 or placement exam. Students will learn to create web pages using HTML and enhance their documents by including hyperlinks, tables, forms, frames and images in their HTML code.

2440:141 Web Server Administration (3 Credits)
Prerequisite: 2440:105 or placement test. Provides Web server administration guidelines such as selecting software/hardware, domain name registration, analyzing security/legal issues, and implementing marketing strategies.

2440:145 Introduction to Unix/Linux (3 Credits)
Prerequisite: 2440:105 or placement exam. This course explores the vital functions that an operating system performs. A multi-user operating system is studied from a functional and hands-on approach.

2440:160 JAVA Programming (3 Credits)
Prerequisite: 2440:121. Course introduces the JAVA programming language. Programming techniques are demonstrated through the coding, testing and debugging of JAVA applications and applets.

2440:170 Visual BASIC (3 Credits)
Prerequisite: 2440:121. Course includes hands-on experience with Visual BASIC, design of Graphical User Interface (GUI) applications, event-driven programming, linking of windows, and accessing relational databases.

2440:180 Introduction to Database Management (3 Credits)
Prerequisite: 2440:121. Overview of database system models and functions. Covers introduction to database design and relational database definition and manipulation using SQL.

2440:201 Networking Basics (3 Credits)
Prerequisite: 2440:105 or placement exam. The introductory course in networking. It includes study of the common network protocols, structures, and models. Basic router and switch configurations are introduced.

2440:202 Router and Routing Basics (3 Credits)
Prerequisite: 2440:201. The second course to networking. It covers basic router configuration as well as routed and routing protocols.

2440:203 Switching Basics and Wireless (3 Credits)
Prerequisites: 2440:201 and 2440:202 with a grade of C or better in both. The third of four courses leading to the CCNA certification. The course covers switching basics and basic wireless networking.

2440:204 WAN Technologies (3 Credits)
Prerequisites: 2440:202 and 2440:203. The fourth of four courses leading to the CCNA certification. Topics covered include IP services and Wide Area Network theory and design.

2440:210 Client/Server Programming (3 Credits)
Prerequisite: 2440:180. Introduces student to client/server programming. Includes hands-on experience using a Rapid Application Development (RAD) tool to show integration of database and program development.

2440:211 Interactive Web Programming (3 Credits)
Prerequisites: 2440:121 and 2440:140. Provides students with instruction on interactive Web programming using XML and DHTML (HTML/XHTML/ HTML5, CSS, and Web scripting).

2440:212 Multimedia & Interactive Web Elements (3 Credits)
Prerequisite: 2440:140. Reviews and demonstrates web tools and techniques like RealAudio, Shockwave, QuickTime, video conferencing and other dynamic graphical elements to enhance Web-based communication. Multimedia software may change to reflect current technology.

2440:240 Computer Information Systems Internship (3 Credits)
Prerequisite: 2440:141, 2440:202 and 2440:247, or [2440:282 and 2440:247]. Provides student experience in computing/information technology in the workplace. Students meet with instructor to discuss and examine experiences.

2440:241 Systems Analysis & Design (3 Credits)
Prerequisites: 2440:180 and [2440:160 or 2440:170 or 2440:256]. Covers all phases of business systems analysis, design, development, and implementation. Such principles as system flowcharting and file and document design emphasized.

2440:247 Hardware Support (3 Credits)
Prerequisite: Admission to program or permission of the program director. This course introduces the student to the basic skills required to troubleshoot, maintain and repair computers.

2440:248 Server Hardware Support (3 Credits)
Prerequisite: 2440:247. This course introduces the student to server hardware and expands student knowledge of client hardware.

2440:251 CIS Projects (3 Credits)
Prerequisite: 2440:241 or permission. Using a simulated work environment, project teams are set up and required to analyze an unstructured problem, prepare alternative designs and implement a solution.

2440:256 C++ Programming (3 Credits)
Prerequisite: 2440:121. This course explores object-oriented programming through C++ program development.

2440:258 Information Continuity and Recovery (3 Credits)
Prerequisites: 2440:201 and 2440:247. This course focuses on issues in keeping organizational information secure and available. It also covers contingency planning for disasters and security breaches.

2440:259 Computer and Network Security (3 Credits)
Prerequisites: 2440:202 and 2440:247. This course focuses on computer and network security issues related to conducting business over the Internet. A common framework of information security terms and principles is used, and students learn to implement these principles in a business environment.

2440:281 Microsoft Networking I (3 Credits)
Prerequisite: 2440:105. Provides the knowledge and skills necessary to manage and maintain Windows in the enterprise. This course also helps prepare the student to pass the MCTS exam.
2440:282 Microsoft Networking II (3 Credits)
Prerequisite: 2440:281. Provides the knowledge and skills necessary to manage and maintain computers with the Windows Server 2008 Network Operating System. This course will also help prepare you to pass the MCTS Exam.

2440:283 Microsoft Networking III (3 Credits)
Prerequisite: 2440:282. Provides the knowledge and skills necessary to manage and maintain an active directory service hosted by the Server 2008 Network Operating System. This course also helps prepare the student to pass the MCTS Exam.

2440:284 Microsoft Networking IV (3 Credits)
Prerequisite: 2440:283 or passing score on the 70-640 Microsoft Certification Exam. This course will provide you with the knowledge and skill necessary to install, configure, manage and maintain the server services provided with Server 2008.

2440:290 Special Topics: Computer Information Systems (1-5 Credits)
Selected topics or subject areas of interest in computer information systems.

2440:300 Network Authentication and Security (3 Credits)
Prerequisites: 2440:204 and junior or better standing. This course focuses on network security issues related to conducting business over the Internet, including authentication, authorization, and firewalls.

2440:303 Voice, Data, and Video (3 Credits)
Prerequisites: 2440:204 and junior or better standing. This course focuses on network issues related to the integration of voice, data, and video over the same network media and equipment.

2440:306 Ethics & Law in Information Technology (3 Credits)
Prerequisite: Junior or greater standing. This course is designed to introduce the student to the central issues concerning intellectual property, privacy, and copyright law as it pertains to the development and distribution of software systems.

2440:310 Wireless Networking (3 Credits)
Prerequisite: 2440:204 or permission. This course provides students with various wireless networking technologies.

2440:311 Client/Server Programming II (3 Credits)
Prerequisite: 2440:210. Discusses tools for client-server programming, distributed computing, socket programming, and security implementation.

2440:321 Server-Side Scripting (3 Credits)
Prerequisites: 2440:121 and 2440:140. This course provides students with instruction on using server-side scripting languages to develop interactive client/server web-based applications.

2440:331 Programming for Cybersecurity (3 Credits)
Prerequisites: 2440:121 and 2440:145 with grades of C or better. This course will introduce basic programming techniques used for ethical hacking using the Linux Operating System and other tools that are commonly used in cybersecurity.

2440:340 Network Forensics I (3 Credits)
Prerequisites: 2220:281 with a grade of C or better and junior or greater standing. This course will provide the student with basic knowledge of surveillance of networking devices, identifying and preventing attacks and incident response.

2440:360 Java Programming II (3 Credits)
Prerequisite: 2440:160. This course covers advanced object-oriented programming concepts, GUI programming, web application programming, network and security programming, JavaBeans and explores aggregations.

2440:365 E-Business Application Development (3 Credits)
Prerequisites: 2440:211 and 2440:321. This course covers web programming techniques to develop Web-based e-business solution and covers e-business models and business issues.

2440:370 Visual Basic Programming II (3 Credits)
Prerequisite: 2440:170. This course explores object-oriented programming through Visual Basic program development at a more advanced level, with more attention to business applications.

2440:388 Advanced UNIX/Linux (3 Credits)
Prerequisites: 2440:145 and junior or greater standing. This course provides students with the necessary knowledge and skills to perform basic administrative tasks on a UNIX/Linux operating system.

2440:400 Advanced Routing (4 Credits)
Prerequisites: 2440:201, 2440:202, 2440:203, 2440:204, 2440:300, and 2030:154, or possess a current CCNA certification and be able to configure a router to the CCNA standards. This course focuses on advanced routing protocols and features and complies with the content of the Cisco Academy Cisco Certified Network Profession (CCNP) Advanced Routing course.

2440:401 Multilayer Switching (3 Credits)
Prerequisites: Must have a current CCNA certification and be able to program a router to the CCNA standards (requires permission), or must have successfully completed all four Cisco Networking Academy CCNA courses from an accredited academy (2440:201, 2440:202, 2440:203, 2440:204). This course focuses on switching protocols and features. This course complies with the content of the Cisco Academy Cisco Certified Network Profession (CCNP) Switching course.

2440:402 Troubleshooting Complex IP-based Networks (4 Credits)
Prerequisites: 2440:400 and 2440:401 with grades of C or better or permission. This course focuses on methodologies and hands-on skills needed to maintain and troubleshoot complex IP networks.

2440:430 Network Monitoring and Management (3 Credits)
Prerequisite: 2440:400 or junior or greater standing. This course provides students the basic theory and practical application of network monitoring and management skills.

2440:431 UNIX-based Systems Security (3 Credits)
Prerequisites: 2440:388 with a grade of C or better and junior or greater standing. This course will introduce the various methods used to secure UNIX-based operating systems (Apple iOS and Andriod Operating System) on a computer network.

2440:440 Intrusion Detection (3 Credits)
Prerequisites: 2440:340 with a grade of C or better, 2440:388, and junior or greater standing. This course will introduce students to the various methods used to detect external and internal intrusion of computer systems.

2440:441 Cyber Security (3 Credits)
Prerequisites: 2030:361, 2440:340, and 2440:388 with a grade of C or better and junior or greater standing. This course will address issues involving hacking, malware, social theories, protocols, firewalls, intrusion detection, the prevention and containment of intrusion incidents, the incident response process, and computer forensic examination.

2440:442 Wireless Forensics (3 Credits)
Prerequisites: 2440:340 with a grade of C or better and junior or greater standing. The forensic identification and tracking of attacks on wireless networks and mobile communications devices.


\textbf{2440:443 Network Forensics II (3 Credits)}  
Prerequisite: 2440:340 with a grade of C or better or junior or greater standing. Deployment, building and running an NSM operation using open source software and vendor neutral tools with the Linx Operating System.

\textbf{2440:450 Applied Data Mining (3 Credits)}  
Prerequisites: 2030:345 and junior or greater standing. This course is designed to introduce the student to the central issues in business data mining.

\textbf{2440:451 Senior Programming Projects (3 Credits)}  
Prerequisite: Senior or greater standing. This course is the capstone course where senior students will apply learned material by simulating a realistic work environment.

\textbf{2440:452 CIS Practicum (3 Credits)}  
Prerequisite: Permission. Provides students with experience in computer information systems operation and maintenance in the workplace. Practicum must be relevant to the specialization area.

\textbf{2440:456 C++ Programming II (3 Credits)}  
Prerequisite: 2440:256. This course explores object-oriented programming through C++ program development at a more advanced level. Also considers Visual programming and connection to databases.

\textbf{2440:465 Data Communications & Networking (3 Credits)}  
Prerequisite: Junior or greater standing. Introduces students to business data communication and networking concepts. The OSI model, various network configuration and popular industry communication protocols are explored at an advanced level.

\textbf{2440:470 Database Management II (3 Credits)}  
Prerequisite: 2440:180. Covers advanced database design, definition, manipulation, and administration tasks with emphasis placed on the relational model, the object-oriented model, and client/server systems.

\textbf{2440:480 Current Topics in Computer Information Systems (3 Credits)}  
Prerequisite: Permission. Seminar in topics of current interest in information technology or special individual topics in information technology.

\textbf{2440:490 CIS Senior Networking Projects (3 Credits)}  
Prerequisites: 2440:388, 2440:400, and 2440:401 with grades of C or better or permission. The capstone course is used to research, document and implement current and advanced IT topics using knowledge and skills developed from networking courses.

\textbf{2440:491 CIS Senior Cybersecurity Project (3 Credits)}  
Prerequisites: 2440:388, 2440:442, and 2440:443 with grades of C or better or permission. This is the capstone course for the CIS Digital Forensics and Cybersecurity degree options.