

# COMPUTER INFORMATION SYSTEMS (CIS)

## CIS102DA / Customer User Support 3 Credits / 4.0 Periods for Lecture & Lab

Examines skills, tools and strategies necessary for becoming a computer help-desk or end-user support professional. Prerequisites: None.

**Division:** Business and Computing Studies

## CIS103 / Introduction to Social Media 3 Credits / 4.0 Periods for Lecture & Lab

Identify and explain social media and Web 2.0 technologies for personal, academic, professional, and business applications. Create and maintain accounts on various sites to socialize, write, and share multimedia, while understanding the related ethics, privacy and security issues.

Prerequisites: None. Course Notes: Students must be 13 years or older to enroll in CIS103 as students are required to create social media accounts for course participation.

**Division:** Business and Computing Studies

## CIS105 / Survey of Computer Information Systems 3 Credits / 4.0 Periods for Lecture & Lab

Overview of computer technology, concepts, terminology, and the role of computers in business and society. Discussion of social and ethical issues related to computers. Use of word processing, spreadsheet, database, and presentation software. Includes uses of application software and the Internet for efficient and effective problem solving. Exploration of relevant emerging technologies. Prerequisites: None.



SUN# CIS 1120

**Fulfills:** Computer/Statistics/Quantitative Applications [CS]; Computer/Stats/Quantitative Apps [CS]-in combo

**Division:** Business and Computing Studies



## CIS111 / Ethics in Information Technology

### 3 Credits / 3.0 Periods for Lecture

Ethical issues that arise as a result of increasing use of computers, and the responsibilities of those who work with computers, either as computer science professionals or end users. Critical inquiry and review of ethical challenges in information technology business, including professional and corporate responsibility, government regulation, fiduciary responsibilities of information, infringement of intellectual property, security risk assessment, Internet crime, identity theft, employee surveillance, privacy, compliance, social networking, and the ethics of IT corporations. Prerequisites: None.

**Division:** Business and Computing Studies

## CIS113DE / Microsoft Word: Word Processing

### 3 Credits / 4.0 Periods for Lecture & Lab

Using word processing software to create, name and manage files, edit text, format, apply themes and styles, create and modify tables, apply desktop publishing features, and print a variety of types of documents. Prerequisites: None.

**Division:** Business and Computing Studies

## CIS114DE / Excel Spreadsheet

### 3 Credits / 4.0 Periods for Lecture & Lab

Computer spreadsheet skills for solving business problems using Excel, including calculations, forecasting, projections, macro programming, database searching, extraction, linking, statistics, and matrix manipulation. Production of graphs and reports. Project design using multiple, integrated spreadsheets. Prerequisites: None.

**Division:** Business and Computing Studies

## CIS117DM / Microsoft Access: Database Management

### 3 Credits / 4.0 Periods for Lecture & Lab

Introduction to Microsoft Access. Emphasis on features, design, and database management. Prerequisites: None. Course Notes: CIS117DM combines the contents of CIS117AM, CIS117BM and CIS117CM. CIS117DM may be repeated for a total of nine (9) credit hours.

**Division:** Business and Computing Studies

## CIS118DB / Desktop Presentation: PowerPoint

### 3 Credits / 4.0 Periods for Lecture & Lab

Use of PowerPoint to produce professional-quality presentation visuals with animation and sound. Prerequisites: None.

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## CIS119DO / Introduction to Oracle: SQL

### 3 Credits / 4.0 Periods for Lecture & Lab

Use of Oracle tools and methodologies to fulfill real-world business information requirements. Hands-on exercises for designing, creating, and maintaining database structures to store, retrieve, update, and display data in a relational database using the SQL programming language. Creating and maintaining database objects. Advanced retrieval techniques. A grade of C or better required in all Prerequisites. Prerequisites or Corequisites: CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

## CIS119DP / Oracle: Database Administration

### 3 Credits / 4.0 Periods for Lecture & Lab

Basic administrative tasks performed by a database administrator (DBA). Conceptual understanding and hands-on applications of the Oracle database architecture and interaction of its components. Prerequisites: A grade of C or better in CIS119DO, or permission of Instructor. (CIS126++ or CIS121++ or MST152++) is recommended.

**Division:** Business and Computing Studies

**CIS120DA / Introduction to Adobe Premiere****3 Credits / 4.0 Periods for Lecture & Lab**

Foundations of video import, export, and editing. Includes parts and function of a video camera, preproduction and production, incorporating photographs, titles, graphics, animation and audio, capturing, editing, rendering and outputting digital video. Prepares students for the Adobe Certifications related to Adobe Premiere. Prerequisites: None.

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**CIS120DB / Introduction to Adobe Illustrator****3 Credits / 4.0 Periods for Lecture & Lab**

Provides students with the knowledge and skills to use Adobe Illustrator graphics software on a computer. Basic foundation course in the use of electronic techniques to create, manipulate, and edit images, text, abstract art, graphics design, color graphics and business charts; determine file formats appropriate for web and print; utilize tools to optimize graphics and create a PDF file. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS120DC / Introduction to Adobe Animate****3 Credits / 4.0 Periods for Lecture & Lab**

Focuses on entry-level skill expectations for digital animation using Adobe Animate. Covers basic animation techniques used in the creation, manipulation, and editing of animation graphics. Prepares students for the Adobe certifications related to Adobe Animate. Prerequisites: None.

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**CIS120DF / Introduction to Adobe Photoshop****3 Credits / 4.0 Periods for Lecture & Lab**

Focuses on entry-level skills and knowledge for digital imaging using Adobe Photoshop. Prepares students for the Adobe Certifications related to Photoshop. Prerequisites: None.

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**CIS120DK / Introduction to Digital Video Editing****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to digital video editing comprises of a foundation for video import, export, and editing functions. Includes parts and function of a video camera, preproduction and production, incorporating photographs, titles, graphics, animation and audio, capturing, editing, rendering and outputting digital video. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS121AB / Microsoft Command Line Operations****1 Credit / 2.0 Periods for Lecture & Lab**

Use of the Microsoft command line interface: basic concepts, internal and external commands, subdirectories, and editor. Prerequisites: None.

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**CIS121AE / Windows Operating System: Level I****1 Credit / 2.0 Periods for Lecture & Lab**

Specific topics include Windows basics, navigating and customizing the desktop, maintaining hardware and software, improving performance, configurations, securing your computer, taskbar, organizing, searching and managing folders and files, installing and uninstalling applications, Internet Explorer fine tuning, security, and searching, including advanced search techniques, keyboard shortcuts, and current topics. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS121AH / Microsoft PowerShell/Command Line Operations****3 Credits / 4.0 Periods for Lecture & Lab**

Day-to-day command line administration tasks of Microsoft Windows. PowerShell used to create scripts to administer Microsoft windows environment. Prerequisites: None. MST150++ suggested but not required.

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**CIS121AI / Mac Operating System****1 Credit / 2.0 Periods for Lecture & Lab**

Specific topics include getting started with Mac OS; working with disks, folders, and files; installing and using applications; setting system preferences; printing, faxing, and scanning; getting and living online; using iLife; sharing a Mac with other users; creating a home network; and maintaining the Mac. Prerequisites: None.

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**CIS122AE / Windows Operating System: Level II****1 Credit / 2.0 Periods for Lecture & Lab**

Additional capabilities of the Windows program that configure devices and customize the presentation of the operating system. System tools, control panel utilities, the My Computer, Network Neighborhood, and Microsoft Exchange desktop icons. Other helpful utilities presented. Prerequisites: A grade of C or better in CIS121AE, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS124AA / Project Management Software: Level I****1 Credit / 1.7 Periods for Lecture & Lab**

Utilization of project management software packages by managers and advanced business students to solve critical management planning tasks. Evaluation of management opportunities utilizing software packages to monitor project progress and resource allocation. Includes "what-if" analyses, and preparation of management reports. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS124BA / Project Management Software: Level II****1 Credit / 1.7 Periods for Lecture & Lab**

Advanced use of project management software. Covers features and functions to solve critical management planning tasks. Project communications, scheduling, resource allocation, tracking processes and importing and exporting data also covered. Project consolidation emphasized. Prerequisites: A grade of C or better in CIS124AA or permission of Instructor.

**Division:** Business and Computing Studies

**CIS126DL / Linux Operating System****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to the Linux Operating system. Develop knowledge and skills required to install, configure and troubleshoot a Linux-based workstation including basic network functions. Learn basic command line and Graphical User Interface (GUI) desktop environment utilities and applications. Fundamental abilities to achieve the entry-level industry certification covered. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS126RH / Red Hat System Administration I****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to core administration skills needed to manage a Red Hat Enterprise Linux system. This Red Hat Academy course helps prepare for the Red Hat certification exams using a hands-on, task-focused curriculum. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS133DA / Internet/Web Development Level I****3 Credits / 4.0 Periods for Lecture & Lab**

Overview of the Internet/World Wide Web (WWW) and its resources. Hands-on experience with various Internet/WWW resource discovery, information retrieval, and social media tools. Design and Development of multi-page websites using current Hyper Text Markup Language (HTML) and Cascading Style Sheets (CSS) standards. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS136 / Content Management Systems: WordPress****3 Credits / 4.0 Periods for Lecture & Lab**

Overview of WordPress Content Management System. Includes hands-on design and creation of web pages and blogs for the World Wide Web. Designed to cover best practices for web site/blog creation. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS138DA / Desktop Design and Publishing Using Adobe InDesign****3 Credits / 4.0 Periods for Lecture & Lab**

Use of Adobe InDesign to compose and print textual and graphic materials of high quality. Includes word processing of copy, use of graphics programs, layout of design elements, printing alternatives, and file formats. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS143 / Introduction to Critical Infrastructure Protection****3 Credits / 3.0 Periods for Lecture**

History and overview of critical infrastructure protection and its ties within the Department of Homeland Security prior to and after September 11, 2001. Focus on risk management associated with sectors specific industries and provides an overview of the public and private partnerships, along with laws and standards developed to protect critical infrastructures. Prerequisites: A grade of C or better in CIS111 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS150 / Programming Fundamentals****3 Credits / 4.0 Periods for Lecture & Lab**

Structured program design and logic tools. Use of computer problems to demonstrate and teach concepts using appropriate programming language. A grade of C or better required in all Prerequisites. Prerequisites or Corequisites: CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS150AB / Object-Oriented Programming Fundamentals****3 Credits / 4.0 Periods for Lecture & Lab**

Structured and Object-Oriented design and logic tools. Use of computer problems to demonstrate and teach concepts using an appropriate programming language. A grade of C or better required in all Prerequisites. Prerequisites or Corequisites: CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS151 / Computer Game Development -Level I****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to object-oriented game development, game design, and game theory. Use of computer software to demonstrate and teach concepts using an appropriate game development platform to model real-time simulations and create computer games using object oriented tools. Introduction to developing PC games, educational software, and training software using windows based object oriented developments tools. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS154 / Database Modeling and Design****3 Credits / 4.0 Periods for Lecture & Lab**

Top-down, systematic approach to defining a database design based on analysis of business information and requirements. Identifying and evaluating standard data model and design patterns. Developing an entity-relationship (ER) diagram that accurately reflects the business. Mapping the ER diagram to an initial database design and revising for complex entities, attributes, and relationships. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS156 / Python Programming: Level I****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to Python programming. Includes general concepts, program design, development, data types, operators, expressions, flow control, functions, classes, input and output operations, debugging, structured programming, and object-oriented programming. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS159 / Visual Basic Programming I****3 Credits / 4.0 Periods for Lecture & Lab**

Use of the Visual Basic programming language to solve problems using suitable examples from business or other disciplines. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS162 / C Programming I****3 Credits / 4.0 Periods for Lecture & Lab**

Beginning C programming. Includes features needed to construct programs, functions, pointers, input and output options, data types, structures, and unions, and disk file operations. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Fulfills:** Computer/Statistics/Quantitative Applications [CS]; Computer/Stats/Quantitative Apps [CS]-in combo

**Division:** Business and Computing Studies

**CIS162AB / C++: Level I****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to C++ programming including general concepts, program design, development, data types, operators, expressions, flow control, functions, classes, input and output operations, debugging, structured programming, and object-oriented programming. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Fulfills:** Computer/Statistics/Quantitative Applications [CS]; Computer/Stats/Quantitative Apps [CS]-in combo

**Division:** Business and Computing Studies

**CIS162AC / Visual C++: Level I****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to Visual C++ programming including general concepts, program design, development, data types, operators, expressions, flow control, functions, classes, input and output operations, debugging, structured programming, and object-oriented programming. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS162AD / C#: Level I****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to C# programming including general concepts, program design, development, data types, operators, expressions, flow control, functions, classes, input and output operations, debugging, structured programming, and object-oriented programming. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Fulfills:** Computer/Statistics/Quantitative Applications [CS]; Computer/Stats/Quantitative Apps [CS]-in combo

**Division:** Business and Computing Studies

**CIS163AA / Java Programming: Level I****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to Java programming. Includes features needed to construct Java Applets, Java Applications, control structures, methods, arrays, character and string manipulation, graphics, and object-oriented programming. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

**Fulfills:** Computer/Statistics/Quantitative Applications [CS]; Computer/Stats/Quantitative Apps [CS]-in combo

**Division:** Business and Computing Studies

**CIS164AB / Oracle: PL/SQL Programming****3 Credits / 4.0 Periods for Lecture & Lab**

Writing PL/SQL procedures, functions, and packages. Creating and managing PL/SQL program units and database triggers in Oracle development environment. Managing dependencies and manipulating large objects. Prerequisites: A grade of C or better in CIS119DO, or permission of the Instructor.

**Division:** Business and Computing Studies

**CIS165 / Introduction to iOS Application Development****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to iOS device programming utilizing the XCode application, and the programming languages Objective-C and/or Swift, utilizing various iOS frameworks. Understand iOS hardware and feature basics. Go through the entire design process from concept to final product delivery. Prerequisites: A grade of C or better in CIS150++, or CIS156, or CIS159, or CIS162++, or CIS163AA, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS165DA / Introduction to Android Application Development****3 Credits / 4.0 Periods for Lecture & Lab**

Beginning with an overview of Android features, this class explores the required software tools and programming techniques for developing Android device applications from creating the user interface, working with activities, intents and views, to using databases, providing data persistence, accessing device services, to debugging and publishing applications. Prerequisites: A grade of C or better in CIS150++, or CIS156, or CIS159, or CIS162++, or CIS163AA, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS165DB / C#/VB.NET: Windows 8 App Development****3 Credits / 4.0 Periods for Lecture & Lab**

Building upon desktop application development with Visual Studio using VB.NET or C# languages, developing apps for Windows 8 utilizes Extensible Application Markup Language (XAML) for interface design. Windows 8 utilizes UI design standards that are unique from previous versions. Develop apps for Windows 8 smartphones and tablets that utilize touch input methods, translate into different resolutions, states, and orientations, and can tap into mobile features such as location and acceleration sensors. Includes working with external data and packaging for Windows Store distribution. Prerequisites: A grade of C or better in CIS159 or CIS162AD or permission of Instructor.

**Division:** Business and Computing Studies

**CIS165DC / Xamarin/C# Cross-Platform Development****3 Credits / 4.0 Periods for Lecture & Lab**

Develop cross-platform mobile apps for iOS, Android, and Windows devices using the Xamarin.Forms Platform and C#, utilizing the Visual Studio IDE. Focusing on Xamarin.Forms projects, the course includes PCL and SAP approaches to shared code, developing interfaces with XAML or in C# code, emulator testing, data binding, backgrounding, packaging for deployment. Coding techniques include Layouts and shared controls (views), MVVM pattern, LINQ, SQLite, and Dependency Injection for platform specific coding. Prerequisites: A grade of C or better in CIS162AD, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS166AA / Introduction to Javascript****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to basic JavaScript programming concepts including syntax. Covers Hypertext Markup Language (HTML), programming logic and debugging, as well as forms manipulation and animation. Prerequisites: A grade of C or better in CIS133DA or permission of Instructor.

**Division:** Business and Computing Studies

**CIS166AE / Web Scripting with PHP: Hypertext Preprocessor (PHP)****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to web scripting with PHP (PHP: Hypertext Preprocessor). Web application development using Hypertext Markup Language (HTML), PHP, programming logic, and Structured Query Language (SQL). Prerequisites: A grade of C or better in CIS133DA or permission of Instructor.

**Division:** Business and Computing Studies

**CIS189 / Virtualization and IT Solutions for Digital Businesses****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to Virtualization course is designed to teach basic virtualization computing concepts to learners. It then expands on the basic technical introduction provided and explores the concepts in more detail with an emphasis on mapping the technologies to business needs and solutions. This course is suitable for anyone who wants to know more about terms like "cloud" and "virtualization." It will serve as a foundation to build upon when students learn how to design, install and configure various cloud technologies. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS190 / Introduction to Networking****3 Credits / 4.0 Periods for Lecture & Lab**

Overview of networks. Emphasis on the elements of a network, current issues and products, and use of a network. Includes terminology, hardware and software components, connectivity, resource monitoring and sharing, electronic mail and messaging, and security issues. Helps prepare students for the CompTIA Network+ examination. Prerequisites: None. Corequisites: CIS105 or permission of Instructor.

**Division:** Business and Computing Studies

**CIS197 / VMware ESXI Server Enterprise****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to vSphere and VMware ESXI server in the enterprise. Covers many aspects of virtualization for VMware ESXI server administration. Designed to develop knowledge and skills required to install, configure and troubleshoot a VMware ESXI Server (vSphere) including basic network functions. Prerequisites: A grade of C or better in [CIS105 and (BPC270 or MST150++) and (CIS126DL or CIS126RH) and (CIS190 or CNT140AB)] or permission of Instructor.

**Division:** Business and Computing Studies



**CIS198 / VMware vSphere: Optimize and Scale****3 Credits / 4.0 Periods for Lecture & Lab**

VMware vSphere: Optimize and Scale is designed for experienced VMware vSphere users. It teaches advanced skills for configuring and maintaining a highly available and scalable virtual infrastructure. Through a mix of lecture and hands-on labs, you will configure and optimize the vSphere features that build a foundation for a truly scalable infrastructure and discuss when and where these features have the greatest effect. It enables you to understand vSphere at a deeper level and how to use advanced features and controls. Prerequisites: A grade of C or better in CIS197.

**Division:** Business and Computing Studies

**CIS200 / VMware NSX: Install, Configure, Manage****3 Credits / 4.0 Periods for Lecture & Lab**

This comprehensive, fast-paced training course focuses on installing, configuring, and managing VMware NSX. This course covers NSX as a part of the software-defined data center platform, implementation use cases along with features of NSX, and functionality operating at Layer 2 through Layer 7 of the OSI model. Lecture and hands-on lab activities support the student's understanding of NSX features, functionality, and on-going management and control. Prerequisites: A grade of C or better in CIS197.

**Division:** Business and Computing Studies

**CIS201 / Introduction to Operational Technology****3 Credits / 4.0 Periods for Lecture & Lab**

Differences between Operational Technology (OT) and Information Technology (IT). Focus on the components and their uses within an OT system. Addresses the inherent threats, physical and cyber related, to an OT system when connected to an IT system needed to be addressed in order to maintain security and resilience. Prerequisites: A grade of C or better in CIS272DB or permission of Instructor.

**Division:** Business and Computing Studies

**CIS202 / Introduction to Smart Grid Security****3 Credits / 3.0 Periods for Lecture**

Focus on differences between control systems, used to control physical and computer information systems, used to process data, in the Power and Utility industry. Power Systems industry, system elements, functions and security risks are covered. Prerequisites: A grade of C or better in (CIS272DB and CIS143) or permission of Instructor.

**Division:** Business and Computing Studies

**CIS203 / Principles of the Risk Management Framework****3 Credits / 4.0 Periods for Lecture & Lab**

History and overview of the Federal Information Security Modernization Act (FISMA) and its effect on cybersecurity management and oversight. Focus of the Risk Management Framework (RMF) and its use in the process of authorizing information systems to operate under the FISMA guidelines. Prerequisites: A grade of C or better in CIS272DB or permission of Instructor.

**Division:** Business and Computing Studies

**CIS213DE / Advanced Microsoft Word: Word Processing****3 Credits / 4.0 Periods for Lecture & Lab**

Using advanced word processing software features to perform tasks such as mail merge, collaboration, web pages, math functions, macros, photo enhancements, graphics, tables, forms and manage long documents. Prerequisites: A grade of C or better in CIS113DE or (CIS113AE and CIS113BE and CIS113CE), or permission of Instructor.

**Division:** Business and Computing Studies

**CIS214DA / Advanced Excel for Data Analytics****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced Excel spreadsheet features for data analytics including advanced functions, PivotTables, Data Modelling, Dashboard creation and forecasting for Business Intelligence (BI). Includes capstone project of an interactive dashboard using a multi-table Excel Data Model. A grade of C or better required in all Prerequisites. Prerequisites or Corequisites: [CIS114DE and (CIS117DM or CIS276DA or CIS276DB)], or permission of Instructor. Course Notes: A basic of understanding of statistics is required.

**Division:** Business and Computing Studies

**CIS214DE / Advanced Excel Spreadsheet: Level II****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced Excel spreadsheet features including formatting techniques, macros and Visual Basic for applications. Templates, built-in functions and lists as well as analysis tools including Pivot Tables and Goal Seek covered. Import and export data, workgroup collaboration and Internet features of Excel emphasized. Prerequisites: A grade of C or better in CIS114DE, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS217AM / Advanced Microsoft Access: Database Management****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced database concepts including database design, primary and secondary key selection and relationships between tables. Queries, sub forms, macros, events, Visual Basic modules and Access Internet features also covered. Prerequisites: A grade of C or better in CIS117DM or CIS117CM.

**Division:** Business and Computing Studies

**CIS220DF / Adobe Photoshop Level II: Advanced Digital Imaging****3 Credits / 4.0 Periods for Lecture & Lab**

Goes beyond the basic use of palettes, selections, layers, menus, and tool options, and focuses on using Photoshop software's advanced features to manipulate and correct digital and digitally produced images. Prerequisites: A grade of C or better in CIS120DF or permission of Instructor.

**Division:** Business and Computing Studies

**CIS224 / Project Management Microsoft Project for Windows****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to project management concepts while working with MS Project to solve complex project management networks, including creating Gantt and PERT charts, tracking project progress, planning for restrictions, and integrating MS Project with other software packages such as Excel, Word, Powerpoint, and cc Mail. Prerequisites: None.

**Division:** Business and Computing Studies

**CIS225 / Business Systems Analysis and Design****3 Credits / 4.0 Periods for Lecture & Lab**

Investigation, analysis, design, implementation and evaluation of business computer systems. Prerequisites: Any programming language or permission of Instructor.

**Division:** Business and Computing Studies

**CIS225AB / Object-Oriented Analysis and Design****3 Credits / 4.0 Periods for Lecture & Lab**

Methodologies and notations for fundamental object-oriented analysis and design including use cases, objects, classes, stereotypes, and relationships. Object-oriented iterative process for system development. A continuous application development exercise for applying the analysis and design concepts. Prerequisites: Any programming language or permission of Instructor.

**Division:** Business and Computing Studies

**CIS227 / Assembly Language****3 Credits / 4.0 Periods for Lecture & Lab**

Concepts and use of the Assembly programming language, including basic arithmetic operations, flow control, and memory management. Prerequisites: A grade of C or better in CIS162++ or permission of Instructor.

**Division:** Business and Computing Studies

**CIS233DA / Internet/Web Development Level II****3 Credits / 4.0 Periods for Lecture & Lab**

Plan, design and create web sites using HTML and Advanced Cascading Style Sheets (CSS). Expedite the development process using CSS frameworks and libraries. Enhance user experience and web site functionality using supporting technologies. Exploration of User Interface (UI) and User Experience (UX), best practices, accessibility, strategies, and careers in web design and development. Prerequisites: A grade of C or better in CIS133DA or permission of Instructor.

**Division:** Business and Computing Studies

**CIS235 / E-Commerce****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to Electronic Commerce on the Internet. Designing an electronic storefront including web page content and development, e-commerce site marketing, advertisement, legal and security considerations, credit card and other debit transaction covered. Also includes current issues in e-commerce. Prerequisites: A grade of C or better in CIS133DA or permission of Instructor.

**Division:** Business and Computing Studies

**CIS238DL / Linux System Administration****3 Credits / 4.0 Periods for Lecture & Lab**

Managing Linux Operating Systems including sophisticated manipulation of file structures, backup systems, printing processes, troubleshooting, user account management, hard disk maintenance and configuration, process monitoring and prioritizing, kernel customization, and system resource control. Preparation for industry certifications such as the CompTIA Linux+, the Red Hat Certified System Administrator (RHCSA), the Red Hat Certified Engineer (RHCE) and the Linux Professional Institute (LPIC-1). Prerequisites: A grade of C or better in CIS126DL or CIS126RH or permission of Instructor.

**Division:** Business and Computing Studies

**CIS238RH / Red Hat System Administration II****3 Credits / 4.0 Periods for Lecture & Lab**

Continue to develop core administration skills needed to manage a Red Hat Enterprise Linux system. This Red Hat Academy course helps to prepare students for the Red Hat certification exams using a hands-on, task-focused curriculum. Prerequisites: A grade of C or better in CIS126RH, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS239DL / Linux Shell Scripting****3 Credits / 4.0 Periods for Lecture & Lab**

Linux Shell Scripting syntax and methods including the automation of system tasks as well as interpreted user-level programming. Course includes the Linux Borne Again Shell (BASH) as well as a variety of industry competitors. Prerequisites: A grade of C or better in CIS238DL or CIS238RH or permission of Instructor.

**Division:** Business and Computing Studies

**CIS240 / Local Area Network Planning and Design****3 Credits / 3.0 Periods for Lecture**

Analysis of the needs and requirements for a local area network (LAN). Emphasis on basic systems analysis and design for a local area network, selection of appropriate hardware and software components. Includes current and future issues, needs analysis, cost estimation, selection of connectivity and network components, and issues relating to access, security, and support. Prerequisites: A grade of C or better in CIS190 or MST140, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS240DL / Linux Network Administration****3 Credits / 4.0 Periods for Lecture & Lab**

In depth networking based on Linux servers and the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite. Integrating Linux servers and workstations into a network environment with multi-platform network operating systems including a variety of open-standard and proprietary protocols. Preparation for industry certifications such as the CompTIA Linux+, the Red Hat Certified System Administrator (RHCSA), the Red Hat Certified Engineer (RHCE) and the Linux Professional Institute (LPIC-1). Prerequisites: A grade of C or better in CIS238DL or permission of Instructor.

**Division:** Business and Computing Studies

**CIS240RH / Red Hat System Administration III****3 Credits / 4.0 Periods for Lecture & Lab**

Provides solid understanding of how to automate services on a Linux system. Covers use of Ansible to automate provisioning, configuration, application deployment, and orchestration on Red Hat Enterprise Linux 8. Content aligns with the Red Hat Certified Engineer (RHCE - EX294) exam, a professional certification. Prerequisites: A grade of C or better in CIS238RH or permission of Instructor.

**Division:** Business and Computing Studies

**CIS250 / Management of Information Systems****3 Credits / 4.0 Periods for Lecture & Lab**

The study of business information systems and its management, communication, e-business strategies, emerging technologies, database concepts, and project management. Overview of systems analysis and design. Learn about the competitive and strategic uses of information systems and how they are transforming organizations and their management. Prerequisites: A grade of C or better in CIS105.

**Division:** Business and Computing Studies

**CIS251 / Computer Game Development - Level II****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced object-oriented game development, advanced game design, and advanced game theory. Use of game development software tools to demonstrate advanced concepts for modeling real-time simulations and creating computer games using object oriented development tools. In depth coverage of game programming (scripting) techniques, and decision logic using object oriented techniques. Prerequisites: A grade of C or better in CIS151, or permission of Instructor.

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**CIS252 / Introduction to Kubernetes Administration****4 Credits / 5.0 Periods for Lecture & Lab**

Provides students skills and knowledge to perform the responsibilities of a Kubernetes administrator. Includes covering the cluster architecture, installation, configuration, workloads, scheduling, services, networking, storage and troubleshooting. Helps students prepare for the Certified Kubernetes Administrator (CKA) certification. Prerequisites: A grade of C or better in CIS238DL or CIS238RH or permission of Instructor.

**Division:** Business and Computing Studies

**CIS256 / Python Programming Level II****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced Python object-oriented programming concepts and applications. Emphasis on code documenting, versioning, unit testing strategies, and security practices for Python project/package development. Includes Python applications for data analysis, networking, database manipulation, and web application development. Prerequisites: A grade of C or better in CIS156 or permission of Instructor.

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**CIS256DA / Python for Data Analysis****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to data analysis concepts using Python's rich set of tools, libraries, and packages. Includes basic data analysis, creation of meaningful data visualizations, and advanced topics such as supervised and unsupervised machine learning techniques. Prerequisites: A grade of C or better in CIS156 or permission of Instructor.

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**CIS259 / Visual Basic Programming II****3 Credits / 4.0 Periods for Lecture**

Use of the Visual Basic programming language to identify and solve advanced problems using suitable examples from business or other disciplines. Prerequisites: A grade of C or better in CIS159, or permission of Instructor.

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**CIS262AB / C++: Level II****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced level C++ programming with emphasis on arrays, data management, dynamic memory allocation, object-oriented programming concepts, input/output operations, libraries, and debugging techniques. Includes overview of other advanced applications of C++. Prerequisites: A grade of C or better in CIS162AB, or permission of Instructor.

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**CIS262AD / C# Level II****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced C# programming with emphasis on data structures, dynamic memory allocation, object-oriented programming, user interfaces, and database processing. Overview of web applications, network programming, and reporting tools. Prerequisites: A grade of C or better in CIS162AD, or permission of Instructor.

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**CIS263AA / Java Programming: Level II****3 Credits / 4.0 Periods for Lecture & Lab**

Intermediate Java programming. Includes features needed to construct object-oriented programming, multithreading, multimedia, files, streams and data structure. Prerequisites: A grade of C or better in CIS163AA or permission of Instructor.

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**CIS265 / Advanced iOS Application Development****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced iOS device programming utilizing the Swift/XCode application, and the programming languages Objective-C and/or Swift, utilizing various iOS frameworks. Understand iOS hardware and feature basics. Go through entire design process from concept to final product delivery. Prerequisites: A grade of C or better in CIS150++ and CIS165, or permission of Instructor.

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**CIS265DA / Advanced Android Application Development****3 Credits / 4.0 Periods for Lecture & Lab**

Advanced Android device programming utilizing an Android Integrated Development Environment, and an Android-focused programming language such as Java or Kotlin, utilizing various advanced activity layouts, views, and intents. Covers advanced Object Oriented Programming (OOP) practices, local and cloud-based database backends, threading, incorporating device features and sensors, and unit testing. Prerequisites: A grade of C or better in CIS165DA or permission of Instructor.

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**CIS266 / Network Integration Capstone****4 Credits / 5.0 Periods for Lecture & Lab**

Application of project management, installation and troubleshooting to integrate multiple operating systems. Topics include: diagnostic and troubleshooting procedures, security vulnerability and penetration software to installation. Prerequisites: A grade of C or better in [(CIS238DL or CIS238RH) and (CIS240DL or CIS240RH)], or CNT160AB, or [(MST155DC and MST157DC) and (CIS270 or CIS271DL or CIS271RH or CNT205)], or associated industry certifications, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS270 / Essentials of Network and Information Security****3 Credits / 4.0 Periods for Lecture & Lab**

Threats to security of information systems; responsibilities and basic tools for information security, including communication security, infrastructure security, organizational security and basic cryptography. Introduction to the language of network security and hardware, software and firmware components of an information security system for local, metropolitan, enterprise, and wide area networks. Helps prepare participants for the Comptia Security+ exam and the GIAC Security Essentials Certificate (GSEC). Prerequisites: A grade of C or better in BPC270 or CIS190 or CNT140AB or MST150++ or permission of Instructor.

**Division:** Business and Computing Studies

**CIS271DB / Information Security Essentials****3 Credits / 4.0 Periods for Lecture & Lab**

Overview of information security principles, access control, risk management, and compliance. Provides partial preparation for certification in one or all of the following: Comptia Security + exam, International Information Systems Security Certification Consortium (ISC)2, Systems Security Certified Practitioner (SSCP) exam, the Committee on National Security Systems (CNSS) 4011 certification, or GIAC Security Essentials Certificate (GSEC). Prerequisites: A grade of C or better in (BPC270 or CIS126DL or CIS126RH or MST150++) and (CIS190 or CNT140++) and (CIS111 or ITS120).

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**CIS271DL / Linux Security****3 Credits / 4.0 Periods for Lecture & Lab**

Implementing in-depth security methods and techniques in a Linux-based network environment. Utilize programs, utilities and configuration techniques to provide user-level, file system, and network security. Gain knowledge in a variety of security cracking techniques and how to guard against them. In all aspects of security, the standard of practicing professional ethics seriously emphasized. Preparation for industry certifications such as the SAIR/GNU LCP and LCA certificates, CompTIA's Linux+, RHCT, RHCE, and LPIC. Prerequisites: A grade of C or better in CIS240DL or permission of Instructor.

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**CIS271RH / Red Hat System Administration IV****3 Credits / 4.0 Periods for Lecture & Lab**

Provides solid understanding on containers, containerized applications, and orchestration of containers using Kubernetes and Red Hat OpenShift on Red Hat Enterprise Linux. Prerequisites: A grade of C or better in CIS238RH or permission of Instructor.

**Division:** Business and Computing Studies

**CIS272DB / Information Security Principles****3 Credits / 4.0 Periods for Lecture & Lab**

Covers threats to the IT infrastructure and how they can impact operations. Demonstrates strategies to mitigate risk impacts as they relate to the IT infrastructure. Provides technical knowledge required to execute on the essentials of information security. Provides partial preparation for certification in one or all of the following: CompTia Security + exam, International Information Systems Security Certification Consortium ((ISC)2), Systems Security Certified Practitioner (SSCP) exam, the Committee on National Security Systems (CNSS) 4011 certification, or GIAC Security Essentials Certificate (GSEC). Prerequisites: A grade of C or better in CIS271DB.

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**CIS275DL / Linux Capstone****3 Credits / 4.0 Periods for Lecture & Lab**

The Linux Capstone course aggregates the skills, knowledge, communication, and critical thinking skills from the Linux Program. This course is to emulate a production environment that prepares students to work as a Linux Systems Administrator. The course helps to prepare students for Linux Industry certification exams. Prerequisites: A grade of C or better in CIS240DL, or CIS240RH, or permission of Instructor.

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**CIS276DA / MySQL Database****3 Credits / 4.0 Periods for Lecture & Lab**

A broad overview of the MySQL database. Includes Structured Query Language (SQL) instruction for data definition, data manipulation, and data retrieval. Develops knowledge and skills required to install MySQL, model and create new databases, manage users, authentication, and stored procedures, and develop backup/restore strategies. Prerequisites: A grade of C or better in CIS105, or CIS117DM, or permission of Instructor.

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**CIS276DB / SQL Server Database****3 Credits / 4.0 Periods for Lecture & Lab**

A broad overview of the Microsoft Structured Query Language (SQL) Server database. Includes SQL instruction for data definition, data manipulation, and data retrieval. Develops knowledge and skills required to install SQL Server, model and create new databases, manage users, authentication, and stored procedures, and develop backup/restore strategies. Prerequisites: A grade of C or better in CIS105, or CIS117DM, or permission of Instructor.

**Division:** Business and Computing Studies

**CIS280 / Current Topics In Computing****3 Credits / 4.0 Periods for Lecture & Lab**

Critical inquiry of current topics in computing. Application of industry trends to solve problems and/or investigate issues. Prerequisites: None.

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**CIS290AA / Computer Information Systems Internship****1 Credit / 6.0 Periods for Laboratory**

Work experience in business or industry. Prerequisites: Permission of Instructor.

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**CIS290AB / Computer Information Systems Internship****2 Credits / 12.0 Periods for Laboratory**

Work experience in business or industry. Prerequisites: Permission of Instructor.

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**CIS290AC / Computer Information Systems Internship****3 Credits / 18.0 Periods for Laboratory**

Work experience in business or industry. Prerequisites: Permission of Instructor.

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**CIS296WB / Cooperative Education****2 Credits / 10.0 Periods for Laboratory**

Work-college experiences that involve the combined efforts of educators and employers to accomplish an outcome related to the career objectives of the students. Prerequisites: Completion of at least twelve (12) college credits, minimum 2.6 grade point average and be able to obtain a position related to student's academic or career goals (student's present job may qualify) or permission of Instructor. Corequisites: Must be concurrent in at least one class which is related to student's major or career interest or with permission of the Instructor.

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**CIS296WC / Cooperative Education****3 Credits / 15.0 Periods for Laboratory**

Work-college experiences that involve the combined efforts of educators and employers to accomplish an outcome related to the career objectives of the students. Prerequisites: Completion of at least twelve (12) college credits, minimum 2.6 grade point average and be able to obtain a position related to student's academic or career goals (student's present job may qualify) or permission of Instructor. Corequisites: Must be concurrent in at least one class which is related to student's major or career interest or with permission of the Instructor.

**Division:** Business and Computing Studies

**CIS298AA / Special Projects****1 Credit / 1.0 Periods for Laboratory**

Organized and tailored around the interests and needs of the individual student. Structured to provide an atmosphere of individualized research and study paralleled by professional expertise and guidance. Professional-type facilities and equipment available for student use. Allows the best aspects of independent study and individualized learning to be combined to maximize student development. Prerequisites: Permission of Program Director or Instructor.

**Division:** Business and Computing Studies

**CIS298AB / Special Projects****2 Credits / 2.0 Periods for Laboratory**

Organized and tailored around the interests and needs of the individual student. Structured to provide an atmosphere of individualized research and study paralleled by professional expertise and guidance. Professional-type facilities and equipment available for student use. Allows the best aspects of independent study and individualized learning to be combined to maximize student development. Prerequisites: Permission of Program Director or Instructor.

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**CIS298AC / Special Projects**

**3 Credits / 3.0 Periods for Laboratory**

Organized and tailored around the interests and needs of the individual student. Structured to provide an atmosphere of individualized research and study paralleled by professional expertise and guidance. Professional-type facilities and equipment available for student use. Allows the best aspects of independent study and individualized learning to be combined to maximize student development. Prerequisites: Permission of Program Director or Instructor.

**Division:** Business and Computing Studies