

BUSINESS & COMPUTING STUDIES

Barbara Gonzalez, Division Chair
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Courses

Prefix	Course
ACC	Accounting
BPC	Business-Personal Computers
CIS	Computer Information Systems
CLD	Cloud Computing
CNT	Cisco Network Technology
CSC	Computer Science
GBS	General Business
IBS	International Business
ITS	Information Technology Security
MGT	Management
MKT	Marketing
MST	Microsoft Technology
SBS	Small Business Management
SBU	Society and Business

Career Programs

Accounting
Administrative Professional
Adobe Foundations: Animation and Graphics Production
Amazon Web Services Cloud Associate
Amazon Web Services Cloud Practitioner
Amazon Web Services Cloud Specialist
Android App Development
Cisco Certified Network Professional Enterprise
Cisco Certified Network Professional: Enterprise Advanced Routing and Services
Cisco Certified Network Professional: Enterprise Core
Cisco Network Administration and Security
Cisco Network Administration: CCNA
Cisco Network Administration: CCNP
Computer System Configuration and Support
Computer System Configuration and Support, Linux
Computer System Configuration and Support, Network
Computer System Configuration and Support, Security
Cyber Engineering
Cyber Operations
Cybersecurity
Cybersecurity Fundamentals
Data Analytics
Desktop Support
Enrolled Agent
Esports
General Business
Information Technology
iOS App Development
Kubernetes Administration
Kubernetes Application Development
Kubernetes Security
Linux Associate

Linux System Administration
Management
Microsoft Desktop Associate
Microsoft Office Professional
Microsoft Office Specialist
Microsoft System Administration
Network and Systems Administration
Oracle Database Operations
Organizational Leadership
Organizational Management
Programming and Systems Analysis
Programming and Systems Analysis Level I
Programming and Systems Analysis Level II
Python Applications
Red Hat Linux Administrator
Red Hat Linux Engineer
Retail Management
Securities Industry Essentials
Securities Industry Essentials: Pre-licensure
Small Business Management
Small Business Start-Up
Social Media Marketing
VMware Network Administrator
Web App Development
Web Design
Web Design/Development
Web Development
Web Foundations

Associate in Applied Science (AAS)

- Accounting, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/accounting-aas/>)
- Cybersecurity, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cybersecurity-aas/>)
- Data Analytics, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/data-analytics-aas/>)
- General Business, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/general-business-aas/>)
- Information Technology, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/information-technology-aas/>)
- Management, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/management-aas/>)
- Network and Systems Administration, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/network-systems-administration-aas/>)
- Organizational Management, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/organizational-management-aas/>)
- Programming and Systems Analysis, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/programming-systems-analysis-aas/>)
- Web Design/Development, Associate in Applied Science (<https://catalog.cgc.edu/educational-programs/business-computing-studies/web-designdevelopment-aas/>)

Certificate of Completion (CCL)

- Accounting, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/accounting-ccl/>)
- Administrative Professional, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/administrative-professional-ccl/>)
- Adobe Foundations: Animation and Graphics Production, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/adobe-foundations-animation-graphics-production-ccl/>)
- Amazon Web Services Cloud Associate, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/amazon-web-services-cloud-associate-ccl/>)
- Amazon Web Services Cloud Practitioner, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/amazon-web-services-cloud-practitioner-ccl/>)
- Amazon Web Services Cloud Specialist, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/amazon-web-services-cloud-specialist-ccl/>)
- Android App Development, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/android-app-development-ccl/>)
- Cisco Certified Network Professional: Enterprise Advanced Routing and Services, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cisco-certified-network-professional-enterprise-advanced-routing-services-ccl/>)
- Cisco Certified Network Professional: Enterprise Core, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cisco-certified-network-professional-enterprise-core-ccl/>)
- Cisco Certified Network Professional: Enterprise, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cisco-certified-network-professional-enterprise-ccl/>)
- Cisco Network Administration and Security, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cisco-network-administration-security-ccl/>)
- Cisco Network Administration: CCNA, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cisco-network-administration-ccna-ccl/>)
- Cisco Network Administration: CCNP, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cisco-network-administration-ccnp-ccl/>)
- Computer System Configuration and Support, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/computer-system-configuration-support-ccl/>)
- Computer System Configuration and Support, Linux, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/computer-system-configuration-support-linux-ccl/>)
- Computer System Configuration and Support, Network, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/computer-system-configuration-support-network-ccl/>)
- Computer System Configuration and Support, Security, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/computer-system-configuration-support-security-ccl/>)
- Cyber Engineering, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cyber-engineering-ccl/>)
- Cyber Operations, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cyber-operations-ccl/>)
- Cybersecurity Fundamentals, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/cybersecurity-fundamentals-ccl/>)
- Data Analytics, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/data-analytics-ccl/>)
- Desktop Support, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/desktop-support-ccl/>)
- Enrolled Agent, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/enrolled-agent-ccl/>)
- Esports, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/esports-ccl/>)
- General Business, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/general-business-ccl/>)
- iOS App Development, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/ios-app-development-ccl/>)
- Kubernetes Administration, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/kubernetes-administration-ccl/>)
- Kubernetes Application Development, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/kubernetes-application-development-ccl/>)
- Kubernetes Security, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/kubernetes-security-ccl/>)
- Linux Associate, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/linux-associate-ccl/>)
- Linux System Administration, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/linux-system-administration-ccl/>)
- Microsoft Desktop Associate, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/microsoft-desktop-associate-ccl/>)
- Microsoft Office Professional, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/microsoft-office-professional-ccl/>)
- Microsoft Office Specialist, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/microsoft-office-specialist-ccl/>)
- Microsoft System Administration, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/microsoft-system-administration-ccl/>)
- Oracle Database Operations, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/oracle-database-operations-ccl/>)

- Organizational Leadership, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/organizational-leadership-ccl/>)
- Programming and Systems Analysis Level I, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/programming-systems-analysis-level-i-ccl/>)
- Programming and Systems Analysis Level II, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/programming-systems-analysis-level-ii-ccl/>)
- Python Applications, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/python-applications-ccl/>)
- Red Hat Linux Administrator, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/red-hat-linux-administrator-ccl/>)
- Red Hat Linux Engineer, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/red-hat-linux-engineer-ccl/>)
- Retail Management, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/retail-management-ccl/>)
- Securities Industry Essentials, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/securities-industry-essentials-ccl/>)
- Security Industry Essentials: Pre-licensure, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/security-industry-essentials-pre-licensure-ccl/>)
- Small Business Management Level I, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/small-business-management-level-one-ccl/>)
- Small Business Management Level II, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/small-business-management-level-two-ccl/>)
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- Social Media Marketing, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/social-media-marketing-ccl/>)
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Microcert

- Amazon Web Services Cloud Practitioner, Certificate of Completion (<https://catalog.cgc.edu/educational-programs/business-computing-studies/amazon-web-services-cloud-practitioner-ccl/>)

Accounting

Cojanu, Gabriela

- M.B.A., Xavier University

Gonzalez, Barbara

Division Chair

- B.B.A., University of New Mexico
- M.B.A., Regis University
- CPA

Fisher, Matthew A.

- B.S., Brigham Young University
- M.Acc., University of Arizona; CPA

Business Personal Computers

Short, Lana

Business and Personal Computers & Computer Information Systems (BPC/CIS)

- AAS, Phoenix College
- M.Ed, St. Petersburg State Pedagogical University
- Ed.D., Northern Arizona University

Cisco Network Technology

Miller, Scott

- B.A., American Intercontinental University

Computer Information Systems

Cherner, Elliot

- B.S., M.B.A., University of Phoenix
- Ed.D., North Central University

Grafel, Deidre

- B.A., University of Florida
- M.A., Jacksonville University
- MCSE, MCT, MCSA

Computer Science

Rayappa, Prema

Computer Science & Computer Information Systems

- OCA Oracle Developer Certified Associate
- B.S., Bangalore University (India)
- M.S., Arizona State University

Huber, Wade

- M.S., University of Texas at Dallas

General Business

Goff, Jamie

- M.Ed., Northern Arizona University

Lopez, Ann

- B.A., B.S., University of Arizona

Lynn, Nicki

- B.S., Townson University
- M.B.A., University of Baltimore

Nuneviller, Beth

- B.S., Arkansas State University
- M.B.A., University of Arkansas

Swan, Gregory C.

- A.A.S., Mesa Community College
- B.S., M.Acc., Arizona State University
- Ed.D., Northern Arizona University
- CPA, MCP, CDP

Information Technology Security

Rahman, Mizan

- B.S., Bangladesh University
- M.S., North Dakota State University
- M.B.A., Arizona State University

Accounting (ACC)

ACC105 / Payroll, Sales and Property Taxes

3 Credits / 3.0 Periods for Lecture

Tax reporting for payroll, sales, and personal property. Prerequisites: None.

Division: Business and Computing Studies

ACC111 / Accounting Principles I

3 Credits / 3.0 Periods for Lecture

Fundamental theory of accounting principles and procedures. Prerequisites: None.

Division: Business and Computing Studies

ACC112 / Accounting Principles II

3 Credits / 3.0 Periods for Lecture

Continuation of the fundamental theory of accounting principles and procedures, including interpretation of general purpose financial statements. Prerequisites: ACC111 with a grade of "C" or better, or permission of Department or Division.

Division: Business and Computing Studies

ACC115 / Computerized Accounting

3 Credits / 3.0 Periods for Lecture & Lab

Understanding of fundamental accounting principles and mastery of an accounting information systems including the general ledger, accounts receivable, accounts payable and payroll. Prerequisites: None.

Division: Business and Computing Studies

ACC121 / Individual Tax Preparation

3 Credits / 3.0 Periods for Lecture & Lab

Theory and practice of accounting for individual taxation. Prerequisites: None.

Division: Business and Computing Studies

ACC211 / Financial Accounting

3 Credits / 3.0 Periods for Lecture

Introduction to theory and practice in the preparation and interpretation of general purpose financial statements. Prerequisites: None.

 SUN# ACC 2201

Division: Business and Computing Studies

ACC212 / Managerial Accounting

3 Credits / 3.0 Periods for Lecture

Development and analysis of accounting information for managerial planning and control. Prerequisites: A grade of "C" or better in (ACC111 and ACC112), or ACC211, and (CIS105 or permission of Department or Division).

 SUN# ACC 2202

Division: Business and Computing Studies

ACC219 / Intermediate Accounting I**3 Credits / 3.0 Periods for Lecture**

Continuation of the theory and practice of financial accounting, applicable to assets, liabilities, equity related problems of income determination and financial reporting. Prerequisites: A grade of C or better in ACC212 or ACC240 or permission of Department or Division.

Division: Business and Computing Studies

ACC221 / Tax Accounting**3 Credits / 3.0 Periods for Lecture**

Theory and practice of accounting for personal, corporate, and non-corporate taxation. Prerequisites: A grade of C or better in ACC111 or ACC211 or permission of Department or Division.

Division: Business and Computing Studies

ACC224 / Tax Practice Administration and Business Entity Analysis**3 Credits / 3.0 Periods for Lecture**

Federal income tax representation, practices, and procedures, including trust and estate income tax, exempt organizations, and retirement plans. Prerequisites: A grade of C or better in ACC121 or ACC221.

Division: Business and Computing Studies

Business-Personal Computers (BPC)**BPC110 / Computer Usage and Applications****3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to business and personal computer operations and usage. Software applications for analyzing and solving business problems including word processing, spreadsheet, database, and presentation graphics. Prerequisites: None.

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

Division: Business and Computing Studies

BPC111AA / Computer Keyboarding I**1 Credit / 1.7 Periods for Lecture & Lab**

Mastery of essential microcomputer keyboarding skills. Emphasis on touch typing of alphabetic and numeric keys and symbols. Prerequisites: None.

Crosslisted: OAS111AA

Division: Business and Computing Studies

BPC171 / Recycling Used Computer Technology**1 Credit / 2.0 Periods for Lecture & Lab**

Use of hardware maintenance knowledge and skills to refurbish used computers. A grade of C or better required in all Prerequisites. Prerequisites or Corequisites: BPC170 or permission of instructor. Course Notes: BPC171 may be repeated for a total of three (3) credit hours.

Division: Business and Computing Studies

BPC270 / A+ Exam Prep: Operating System Configuration and Support**3 Credits / 4.0 Periods for Lecture & Lab**

Explore advanced technical aspects of maintaining and servicing computers. Emphasis placed on OS installation, maintenance, mobile devices, security, software troubleshooting, and on proper usage of tools, safety procedures, and professionalism. Helps prepare students for the CompTIA A+ examinations. Prerequisites: A grade of C or better in CIS105 or permission of Instructor.

Division: Business and Computing Studies

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.

Division: Business and Computing Studies

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

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.

Division: Business and Computing Studies

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.

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.

Division: Business and Computing Studies

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.

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

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

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

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

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

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

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

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

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

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

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.

Division: Business and Computing Studies

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.

Division: Business and Computing Studies

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.

Division: Business and Computing Studies

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

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

Division: Business and Computing Studies

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

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

Division: Business and Computing Studies

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

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

Division: Business and Computing Studies

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.

Division: Business and Computing Studies

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

Cloud Computing (CLD)**CLD110 / Amazon Web Services Cloud Foundations****3 Credits / 4.0 Periods for Lecture & Lab**

Provides a detailed overview of cloud concepts, Amazon Web Services (AWS) core services, security, architecture, pricing, and support. Intended for students who seek an overall understanding of cloud computing concepts, independent of specific technical roles. Helps to prepare students for the AWS Certified Cloud Practitioner exam. Prerequisites: None. CIS105 suggested but not required.

Division: Business and Computing Studies

CLD120 / Amazon Web Services Cloud Architect Associate**3 Credits / 4.0 Periods for Lecture & Lab**

Fundamentals of building IT infrastructure on Amazon Web Services (AWS). Focus on how to optimize use of the AWS Cloud by understanding AWS services and best practices for the AWS Cloud and how they fit into cloud-based solutions. Covers design patterns for architecting optimal IT solutions on AWS, as well as strategies and services implemented on AWS. Prerequisites: A grade of C or better in CLD110 or permission of Instructor.

Division: Business and Computing Studies

Cisco Network Technology (CNT)**CNT140AB / Introduction to Networks****4 Credits / 6.0 Periods for Lecture & Lab**

Focus on the architecture, structure, functions, components, and models of the Internet and other computer networks. Principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations are introduced. Students will build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. Preparation for Cisco certification examination. Prerequisites: None.

Division: Business and Computing Studies

CNT150AB / Switching, Routing, and Wireless Essentials**4 Credits / 6.0 Periods for Lecture & Lab**

Focus on configuring switches and routers for use in small and medium size networks. Including Virtual Local Area Networks (VLANs), VLAN trunking, Inter-VLAN routing, Spanning Tree Protocol (STP), EtherChannel, Dynamic Host Configuration Protocol (DHCP), First Hop Redundancy, Local area Network (LAN) and Switch security, and Static routing. Knowledge and skills needed to implement a Wireless Local Area Network (WLAN) is also covered. Preparation for Cisco certification examination. Prerequisites: A grade of C or better in CNT140AB or permission of Instructor.

Division: Business and Computing Studies

CNT160AB / Enterprise Networking, Security, and Automation**4 Credits / 6.0 Periods for Lecture & Lab**

Focus on the configuration of routers and switches within small and medium size networks for advanced functionality including Open Shortest Path First (OSPF), Network security, Access Control Lists (ACLs), Network Address Translation (NAT), Wide Area Network (WAN) concepts, Virtual Private Networks (VPNs), Quality of Service (QoS), network management, design, troubleshooting, virtualization, and automation. Preparation for Cisco certification examination. Prerequisites: A grade of C or better in CNT150AB or permission of Instructor.

Division: Business and Computing Studies

CNT202 / Cisco Secure Firewall Appliance Configuration**4 Credits / 5.0 Periods for Lecture & Lab**

Applications of Cisco Networking technologies in designing and implementing security solutions to reduce risk of revenue loss and vulnerability. Hands-on experience and skills in security policy design and management, security technologies, products and solutions, secure firewall design, installation, configuration and maintenance, Authentication, Authorization, and Accounting (AAA), Failover, and Virtual Private Network (VPN) implementation using firewalls. Prerequisites: A grade of C or better in CNT160AB or permission of Instructor.

Division: Business and Computing Studies

CNT205 / Cisco Certified Network Associate Security**4 Credits / 6.0 Periods for Lecture & Lab**

Associate-level knowledge and skills required to secure Cisco networks. Development of a security infrastructure, identification of threats and vulnerabilities to networks. Mitigation of security threats. Core security technologies. Installation, troubleshooting and monitoring of network devices to maintain integrity, confidentiality and availability of data and devices. Competency in the technologies that Cisco uses in its security structure. Prerequisites: A grade of C or better in CNT160AB, or Cisco Certified Network Associate (CCNA) certification, or permission of Instructor.

Division: Business and Computing Studies

CNT206 / Cisco Certified Network Associate Wireless**4 Credits / 6.0 Periods for Lecture & Lab**

Associate-level knowledge and skills required in Cisco wireless networks. Includes comprehensive hands-on labs to design, plan, implement, operate, secure, and troubleshoot wireless networks. Prerequisites: A grade of C or better in CNT160AB or permission of Instructor. Course Notes: Prepares students to earn Cisco Certified Network Associate Wireless (CCNA Wireless) designation by taking the Implementing Cisco Unified Wireless Networks Essentials (IUWNE) exam.

Division: Business and Computing Studies

Computer Science (CSC)**CSC100AA / Introduction to Computer Science (C++)****3 Credits / 4.0 Periods for Lecture & Lab**

Concepts of problem solving, structured programming in C++, fundamental algorithms and techniques, and computer system concepts. Social and ethical responsibilities. Intended for majors other than Computer Science. Prerequisites: A grade of C or better in MAT095, or MAT096, or MAT114, or MAT115, or MAT12+, or an appropriate District placement for MAT15+ or higher, or permission of Instructor or Department/Division Chair.

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

Division: Business and Computing Studies

CSC110AA / Introduction to Computer Science (Java)**3 Credits / 4.0 Periods for Lecture & Lab**

Concepts of problem-solving, structured and object-oriented programming in Java, fundamental algorithms and techniques and computer system concepts. Social and ethical responsibilities. Intended for Computer Science and Computer Systems Engineering majors.

Prerequisites: A grade of C or better in MAT095, or MAT096, or MAT114, or MAT115, or MAT12+, or an appropriate District placement for MAT15+ or higher, or permission of Instructor or Department/Division Chair.

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

Division: Business and Computing Studies

CSC110AB / Introduction to Computer Science (Java)**4 Credits / 4.0 Periods for Lecture & Lab**

Concepts of problem-solving, structured and object-oriented programming in Java, fundamental algorithms and techniques and computer system concepts. Social and ethical responsibilities. Intended for Computer Science and Computer Systems Engineering majors.

Prerequisites: A grade of C or better in MAT095, or MAT096, or MAT114, or MAT115, or MAT12+, or an appropriate District placement for MAT15+ or higher, or permission of Instructor or Department/Division Chair.

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

Division: Business and Computing Studies

CSC120 / Digital Design Fundamentals**4 Credits / 6.0 Periods for Lecture & Lab**

Number systems, conversion methods, binary and complement arithmetic, Boolean switching algebra and circuit minimization techniques. Analysis and design of combinational logic, flip-flops, simple counters, registers, ROMs, PLDs, synchronous and asynchronous sequential circuits, and state reduction techniques. Building physical circuits. Prerequisites: None. Corequisites: CSC100 or CSC110 or permission of Instructor or Division or Department Chair.

Crosslisted: EEE120

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

Division: Business and Computing Studies

CSC180AA / Computer Literacy**3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to computers and technology and their impact on society. Explores technology, current topics in computing, applications and related issues. Students gain fluency in integrating technology to solve problems using computational thinking. Use of application software to create documents, spreadsheets, databases, e-mail and text files, and use of Internet browsers. Prerequisites: None.

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

Division: Business and Computing Studies

CSC180AB / Computer Literacy**4 Credits / 4.0 Periods for Lecture**

Introduction to computers and technology and their impact on society. Explores technology, current topics in computing, applications and related issues. Students gain fluency in integrating technology to solve problems using computational thinking. Use of application software to create documents, spreadsheets, databases, e-mail and text files, and use of Internet browsers. Prerequisites: None.

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

Division: Business and Computing Studies

CSC181AA / Applied Problem Solving With Visual Basic**3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to systematic definition of problems, solution formulation, and testing. Visual BASIC programming language applied to problems in mathematics, science, and business. Prerequisites: None.

Division: Business and Computing Studies

CSC181AB / Applied Problem Solving With Visual Basic**4 Credits / 4.0 Periods for Lecture**

Introduction to systematic definition of problems, solution formulation, and testing. Visual BASIC programming language applied to problems in mathematics, science, and business. Prerequisites: None.

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

Division: Business and Computing Studies

CSC182AA / Principles Of Programming With C#.NET**3 Credits / 4.0 Periods for Lecture & Lab**

Introduction to object-oriented program analysis, design, and development using Visual C#.NET. Includes general concepts, data types, expressions, flow control, methods, classes, arrays, event-driven models, Windows applications, and Web applications. Prerequisites: None.

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

Division: Business and Computing Studies

CSC205AA / Object Oriented Programming and Data Structures**3 Credits / 4.0 Periods for Lecture & Lab**

Covers Object-Oriented design and programming; elementary data structures; arrays; lists; stacks; queues; binary trees; recursion; searching and sorting algorithms. Prerequisites: A grade of C or better in CSC110 or permission of Instructor.

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

Division: Business and Computing Studies

CSC220 / Programming for Computer Engineering**3 Credits / 5.0 Periods for Lecture & Lab**

Introduction to procedural programming (C/C++) and hardware description language (VHDL). Prerequisites: A grade of C or better in (CSC/EEE120 and CSC205), or permission of Instructor or Division or Department Chair.

Division: Business and Computing Studies

CSC230 / Computer Organization and Assembly Language**4 Credits / 5.0 Periods for Lecture & Lab**

Assembly language programming including input/output (I/O) programming and exception/interrupt handling. Register-level computer organization, I/O interfaces, assemblers, and linkers. Processor organization and design, data path, control, pipelining, and input/output. Memory organization with cache and virtual memory. Prerequisites: A grade of C or better in [(CSC100 or CSC110) and CSC/EEE120], or permission of Instructor or Division or Department Chair.

Crosslisted: EEE230

Division: Business and Computing Studies

CSC240 / Introduction to Different Programming Languages**3 Credits / 5.0 Periods for Lecture & Lab**

Introduction to procedural (C/C++), applicative (LISP), and declarative (Prolog) languages.

Division: Business and Computing Studies

General Business (GBS)**GBS109 / Introduction to Esports Management****3 Credits / 3.0 Periods for Lecture**

Introduction to Esports will introduce the business, economics, operations and marketing of the Esports industry. Historical and cultural implications will be examined from the early days of competitive video gaming, to today's billion dollar industry. Global awareness and diverse cultural viewpoints and trends will be studied as they relate to the Esports industry. This course will introduce students to the numerous business opportunities to work and grow in the dynamic Esports industry. Prerequisites: None.

Division: Business and Computing Studies

GBS120 / Workplace Communication Skills**3 Credits / 3.0 Periods for Lecture & Lab**

Reviews planning, organization, development, and evaluation of written and oral communication in business settings, including informative and persuasive messages. Prerequisites: None.

Division: Business and Computing Studies

GBS131 / Business Calculations**3 Credits / 3.0 Periods for Lecture**

Review of basic arithmetic and application of mathematics to business problems, includes percentage, interest, discount, and markups. Prerequisites: None.

Division: Business and Computing Studies

GBS132 / Personal and Family Financial Security**3 Credits / 3.0 Periods for Lecture**

Principles and practices of personal and family financial planning, includes savings, budgeting, credit, buying versus renting, and general principles of consumerism. Prerequisites: None.

Division: Business and Computing Studies

GBS151 / Introduction to Business**3 Credits / 3.0 Periods for Lecture**

Characteristics and activities of current local, national, and international business. An overview of economics, marketing, management and finance. Prerequisites: None.

Division: Business and Computing Studies

GBS205 / Legal, Ethical, and Regulatory Issues in Business**3 Credits / 3.0 Periods for Lecture**

Legal theories, ethical issues and regulatory climate affecting business policies and decisions. Prerequisites: None.

Division: Business and Computing Studies

GBS220 / Quantitative Methods in Business**3 Credits / 3.0 Periods for Lecture**

Business applications of quantitative optimization methods in operations management decisions. Prerequisites: (A grade of C or better in MAT150 or MAT151 or MAT152) or satisfactory District math placement.

Division: Business and Computing Studies

GBS221 / Business Statistics**3 Credits / 3.0 Periods for Lecture**

Business applications of descriptive and inferential statistics, measurement of relationships, and statistical process management. Includes the use of spreadsheet software for business statistical analysis. Prerequisites: A grade of C or better in GBS220 or MAT217 or MAT218.

 SUN# BUS 2201

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

Division: Business and Computing Studies

GBS233 / Business Communication**3 Credits / 3.0 Periods for Lecture**

Internal and external business communications, including verbal and nonverbal techniques. Prerequisites: ENG101 or ENG107 with grade of "C" or better, or permission of Department or Division.

Fulfills: Literacy & Critical Inquiry [L]; Literacy & Critical Inquiry [L]-in combo

Division: Business and Computing Studies

GBS261 / Investments I**3 Credits / 3.0 Periods for Lecture**

Evaluation of various investment forms including study of inflation, taxation, government securities, stocks and bonds, real estate and retirement plans. Securities industry knowledge and skills for individuals to prepare for careers in Financial Services. Includes capital markets, types of products and their risks, trading, customer accounts, prohibited activities, and regulatory agencies and their functions. Helps to prepare students for the Financial Industry Regulatory Authority (FINRA) Securities Industry Essentials (SIE) Examination required for entry-level positions in the security industry. Prerequisites: None. Corequisites: Concurrent enrollment in GBS261LL recommended but not required. Course Notes: Students interested in taking the Financial Industry Regulatory Authority (FINRA) Securities Industry Essentials (SIE) Examination should also enroll in the GBS261LL Securities Industry Essentials (SIE) Exam Prep course.

Division: Business and Computing Studies

GBS261LL / Securities Industry Essentials (SIE) Exam Prep**1 Credit / 1.0 Periods for Lecture & Lab**

Helps to prepare students for the Financial Industry Regulatory Authority (FINRA) Securities Industry Essentials (SIE) Examination required for prospective securities industry professionals. Focuses on reviewing key concepts, practicing skills, and preparing to successfully demonstrate existing knowledge on the SIE certification exam. The course is designed to provide an overview of exam topics and study and test-taking strategies. It also will include structured study time, group discussions, and the use of practice exams to assess test readiness. Prerequisites: None. Corequisites: Concurrent enrollment in GBS261 recommended but not required. Course Notes: GBS261 is recommended for students who are not already employed in the financial services industry and need more in-depth content related to the SIE exam.

Division: Business and Computing Studies

International Business (IBS)**IBS101 / Introduction to International Business****3 Credits / 3.0 Periods for Lecture**

A basic overview of international business to introduce students to international trade concepts. Focus of the course is on international business environment issues that influence global business practices, decisions and applications. Prerequisites: None.

Fulfills: Global Awareness [G]; Global Awareness [G]-in combo

Division: Business and Computing Studies

Information Technology Security (ITS)**ITS110 / Information Security Fundamentals****3 Credits / 4.0 Periods for Lecture & Lab**

Fundamental concepts of information technology security. Topics include authentication methods, access control, cryptography, Public Key Infrastructure (PKI), network attack and defense methods, hardening of operating systems and network devices, securing remote access and wireless technologies and securing infrastructures and topologies. Emphasis on hands-on labs in both the Windows and Linux environments. Builds on thorough understanding of Transmission Control Protocol/Internet Protocol (TCP/IP) and security concepts and Microsoft (MS) Windows and Linux Administration. Prerequisites: A grade of C or better in CIS126DL, or CIS126RH, or permission of Program Director. Corequisites: BPC270 or MST150++.

Division: Business and Computing Studies

ITS120 / Legal, Ethical and Regulatory Issues**3 Credits / 3.0 Periods for Lecture**

Exploration of legal and ethical issues unique to information security. Analysis of professional ethical codes and their application to information security practitioners. Federal and state laws as they relate to information security. Prerequisites: None.

Division: Business and Computing Studies

ITS240 / Ethical Hacking and Network Defense**3 Credits / 4.0 Periods for Lecture & Lab**

Preparation for the EC-Council Certified Ethical Hacking examination. In-depth exploration of how to effectively protect computer networks from risks ranging from malicious infiltration to cyber-warfare. Includes examination of ethical hacking, relevant tools and methodologies, and its importance to network security. Resources to identify new computer network vulnerabilities and counter security strategies will be discussed as well as an overview of relevant computer crime laws and penalties. Prerequisites: A grade of C or better in ITS110, or CNT205, or CIS270, or CIS271DB, or CIS272DB, or permission of Instructor.

Division: Business and Computing Studies

ITS291 / Computer Forensics Foundations**4 Credits / 5.0 Periods for Lecture & Lab**

Development of foundational computer forensic skills. Introduction to preserving, identifying, extracting, interpreting, and documenting computer data as part of a forensically sound analysis. Examination of the physical and logical structure of hard drives. Study of the logical structure of Windows-based file systems and common applications. Introduction to the logical structure of Unix/Linux-based file systems and common applications of commercial forensic tools. Prerequisites: A grade of C or better in BPC170 and ITS110 or permission of Instructor.

Division: Business and Computing Studies

ITS292 / Advanced Computer Forensics**4 Credits / 5.0 Periods for Lecture & Lab**

Advanced computer forensics analysis techniques with commercial tools. Introduction to open-source forensic tools. Emphasis on data recovery from complex applications and media types. Study of the logical structure of Unix/Linux-based file systems. Advanced search techniques. Analysis of unallocated space, compound files, and NTFS artifacts. Prerequisites: A grade of C or better in ITS291 or permission of Instructor.

Division: Business and Computing Studies

Management (MGT)

MGT101 / Techniques of Supervision

3 Credits / 3.0 Periods for Lecture

Overview of the foundations of supervision and how to get things done within an organization through other people. The functions of planning, organizing, staffing, motivating and controlling presented. Prerequisites: None.

Division: Business and Computing Studies

MGT126 / Customer Service Skills and Strategies

3 Credits / 3.0 Periods for Lecture & Lab

Explores strategies to help improve job performance and develop a service-oriented philosophy. Uses practical training concepts and techniques to demonstrate how superior customer service can lead to competitive advantage and profitability in business. Focuses on both internal and external customers, interactions among people, processes, and systems within the organization and how to integrate these areas into a total quality delivery program. Prerequisites: None.

Division: Business and Computing Studies

MGT175 / Business Organization and Management

3 Credits / 3.0 Periods for Lecture

Covers basic principles of managing quality and performance in organizations. Covers management functions: planning, organizing, leading, and controlling. Emphasizes continual improvement, ethics, and social responsibility. Prerequisites: None.

Division: Business and Computing Studies

MGT229 / Management and Leadership I

3 Credits / 3.0 Periods for Lecture

Covers management concepts and applications for business, industry, and government organizations. Prerequisites: None.

Fulfills: Social-Behavioral Sciences [SB]; Social-Behavioral Sciences [SB]-in combo

Division: Business and Computing Studies

MGT251 / Human Relations in Business

3 Credits / 3.0 Periods for Lecture

Analysis of motivation, leadership, communications, and other human factors. Cultural differences that may create conflict and affect morale individually and within organizations. Prerequisites: None. MGT101 or MGT175 or MGT229 suggested, but not required.

Division: Business and Computing Studies

MGT253 / Owning and Operating a Small Business

3 Credits / 3.0 Periods for Lecture

Starting, organizing, and operating a small business, including location, finance management processes, advertisement and promotion, credit, inventory control and ethics. Prerequisites: None.

Division: Business and Computing Studies

Marketing (MKT)

MKT101 / Introduction to Public Relations

3 Credits / 3.0 Periods for Lecture

Emphasizes public relations techniques used both within and outside the business organization, including operation of a PR counseling firm. Prerequisites: None.

Division: Business and Computing Studies

MKT110 / Marketing and Social Networking

3 Credits / 3.0 Periods for Lecture

Theory and practice in the use of social media in marketing. Topics may include a history of social media, preparation for social marketing, the power of collective influence, and how to engage with social media. Reviews social mediums, social networks, platforms and other marketing tools used to create a social media campaigns. Prerequisites: None.

Division: Business and Computing Studies

MKT111 / Applied Marketing and Social Networking

3 Credits / 4.0 Periods for Lecture & Lab

Examination of the strategic use of digital and social media marketing platforms and tools for global communication and networking, including analysis of various digital and social media platforms and tools for developing brands, creating professional networks and creating engaging content. Hands-on use of social media platforms and tools to conduct research, develop strategies for creating, integrating, and evaluating social media marketing campaigns, and development of metrics to measure effectiveness. Prerequisites: A grade of C or better in MKT110.

Division: Business and Computing Studies

MKT112 / Retail Customer Service

1 Credit / 1.0 Periods for Lecture

Introduction to the field of retail sales. Emphasis on customer service and sales techniques. Prerequisites: None.

Division: Business and Computing Studies

MKT114 / Retail Inventory Control

1 Credit / 1.0 Periods for Lecture

Retail inventory control procedures. Emphasis on the role of the professional sales associate within a retail company and in the handling of merchandise. Prerequisites: A grade of C or better in MKT112.

Division: Business and Computing Studies

MKT267 / Principles of Sales

3 Credits / 3.0 Periods for Lecture

Analyzes and applies the steps and techniques used in personal selling. Highlights the role of the professional sales representative and his/her functions as they relate to the company's mission and customer expectations. Prerequisites: None.

Division: Business and Computing Studies

MKT271 / Principles of Marketing

3 Credits / 3.0 Periods for Lecture

An analysis of the marketing process and environment with regard to the product, pricing, distribution, and communication in order to satisfy buyer needs. Prerequisites: None.

Division: Business and Computing Studies

MKT280AB / Marketing Internship

2 Credits / 2.0 Periods for Lecture & Lab

Marketing work experience in a business or industry. 80 hours of designated work per credit. Prerequisites: Permission of Department or Division.

Division: Business and Computing Studies

Microsoft Technology (MST)

MST150WT / Installing and Configuring Microsoft Windows 10

3 Credits / 4.0 Periods for Lecture & Lab

In-depth exploration of how to effectively install and configure Windows 10. Includes features of Windows 10, virtualization improvements, network connectivity, access to resources, monitor and maintain Windows clients and backup and recovery. Designed to prepare students for the Microsoft Windows 10 certification examination. Prerequisites: None. CIS190 or CNT140AB suggested but not required.

Division: Business and Computing Studies

Small Business Management (SBS)

SBS200 / Small Business Operations

2 Credits / 2.0 Periods for Lecture

In-depth analysis of and individual plan development for the "day-to-day" problems encountered in the operation of a small business. Includes the development of an individual business operations plan including finance, purchasing, production scheduling, maintenance, shipping/receiving, personnel management and insurance/risk management requirements. Investigation of daily problems related to inventory control and business expansion. Prerequisites: None.

Division: Business and Computing Studies

SBS213 / Hiring and Managing Employees

1 Credit / 1.0 Periods for Lecture

Methods and techniques for managing employees in a small business. Includes supervisor's role, leadership styles, interpersonal communications, staff planning, employee work styles, techniques for handling problem employees, and employee motivation. Focuses on real life situations to enable the business owner to gain high performance from their employee team. Includes segment on hiring, new employee orientation, training, benefits, and developing future staffing needs assessment. Prerequisites: None.

Division: Business and Computing Studies

SBS214 / Small Business Customer Relations

1 Credit / 1.0 Periods for Lecture

Developing and improving customer relations for the small business. Planning and delivering quality customer service. Includes topics on attitude of employees, customer perceptions and motivations, handling customer dissatisfaction, and developing customer, supplier, vendor, and distributor loyalty. Prerequisites: None.

Division: Business and Computing Studies

SBS220 / Internet Marketing For Small Business

2 Credits / 2.0 Periods for Lecture

Focuses on "e-Commerce"-doing business on the Internet and planning a web site. Topics include: how the Internet can help growth and success of business; examples of successful marketing on the Internet; availability of Internet services; necessary hardware and software for marketing on the Internet; determining products/services appropriate for Internet marketing; budget constraints and ongoing operations of the Internet site. Prerequisites: None.

Division: Business and Computing Studies

SBS230 / Financial and Tax Management for Small Business

2 Credits / 2.0 Periods for Lecture

An overview of accounting and recordkeeping for the successful management of a small business. Develops an understanding of the accounting cycle and preparation of financial statements. Includes section on tax consequences and the choice of legal entity choice based on taxation. Prerequisites: None.

Division: Business and Computing Studies

Society and Business (SBU)

SBU200 / Society and Business

3 Credits / 3.0 Periods for Lecture

The study and scientific inquiry of issues and demands placed on business enterprise by owners, customers, government, employees and society. Included are social, ethical and public issues and analysis of the social impact of business responses. Prerequisites: None.

Fulfills: Global Awareness [G]; Global Awareness [G]-in combo; Social-Behavioral Sciences [SB]; Social-Behavioral Sciences [SB]-in combo

Division: Business and Computing Studies