Computer Information Systems

Computer Information Systems

Business, Management, Marketing and Technology

Auburn Hills and Orchard Ridge Campuses

Associate Degrees

The Computer Information Systems (CIS) associate degrees are designed for students who need general education (e.g., communication, science, mathematics, fine arts, social science) combined with a solid foundation in the fundamental computer skills that are generally required to design, create, and test software, or analyze business system requirements and design solutions, or support and protect the operation of technology resources. These fundamental computer skills are commonly required by most four-year educational programs that offer the types of bachelor degrees most employers look for when hiring information technology professionals. All CIS courses use current computer tools and place an emphasis on practical application to provide a relevant learning environment.

Four CIS associate degree choices are available:

- Business Systems Analysis Option (CIS.BSA.AAS)
- Cybersecurity Option (CIS.CYS.AAS)
- Information Technology Support Option (CIS.ITS.AAS)
- Software Engineering Option (CIS.SWE.AAS)

Certificates

The Computer Information Systems (CIS) certificates are designed for students who need specialty skills in a particular area of information technology that will help satisfy current of future employment requirements. Unlike associate degrees, certificate programs assume that students already have obtained or do not require general education skills and are now looking for education in a specific area of computer technology. Therefore, all of the courses within a certificate program are chosen to develop these specific technical skills in a shorter amount of time than what would be required in an associate degree program.

Five CIS certificate choices are available. Two of the five choices (Software Engineering and Information Technology Support) are fairly broad areas that require multiple types of focus areas within them. The courses within each focus area have been chosen to match with popular employer requirements for that particular skill type.

- Cybersecurity Certificate (CIS.CYS.CT)
- Information Technology Support Certificate (CIS.ITS.CT)[1]
    - Computer and Systems Support (focus area)
    - Database Technology and Administration (focus area)
    - Network Technology and Administration (focus area)
- Software Engineering Certificate (CIS.SWE.CT)[1]
    - Game Design and Development (focus area)
    - General Software Development (focus area)
    - Mobile Application Development (focus area)
    - Web Application Development (focus area)
- Web Designer Certificate (CIS.WDE.CT)

- Cisco Internetworking Certificate of Achievement (CIS.CIN.CA)

1. **A separate certificate is not awarded for each focus area. For the CIS.ITS.CT program, students choose 1 of 3 focus areas. For the CIS.SWE.CT program, students choose 1 of 4 focus areas.**

Other Training Options

Professional certification preparation courses are offered through the OCC CIS department as well as the Economic and Workforce Development office. Industry exam preparation courses cover material from certifying organizations such as Microsoft, Cisco, Sun, Oracle, Novell, and CompTIA. Several exam preparation courses (e.g., CIS-1305, CIS-1310, CIS-1320, CIS-1330, CIS-1600, CIS-2434, CIS-2515, CIS-2535, CIS-2616, CIS-2980) offered for credit through the CIS department are listed in the OCC course catalog. Custom-designed non-credit courses for local businesses are also available through Workforce Development. CIS course details may be obtained by contacting the CIS department at the Orchard Ridge or Auburn Hills campus. Custom course details and related information may be obtained by contacting the Economic and Workforce Development office at (248) 232-4000 in the M-TEC building on the Auburn Hills Campus.

The M-TEC building also serves as a Pearson VUE Authorized Test Center where students can take official certification exams. Information about testing and related Economic and Workforce Development services is available within the OCC website at www.oaklandcc.edu.

Degrees

- Computer Information Systems - Business Systems Analysis Option (CIS.BSA.AAS) (http://catalog.oaklandcc.edu/programs/computer-information-systems/business-systems-analysis-option-aas)
- Computer Information Systems - Cybersecurity Option (CIS.CYS.AAS) (http://catalog.oaklandcc.edu/programs/computer-information-systems/cybersecurity-option-aas)
- Computer Information Systems - Information Technology Support Option (CIS.ITS.AAS) (http://catalog.oaklandcc.edu/programs/computer-information-systems/tech-support-option-aas)
- Computer Information Systems - Software Engineering Option (CIS.SWE.AAS) (http://catalog.oaklandcc.edu/programs/computer-information-systems/software-engineering-option-aas)

Certificates

- Computer Information Systems - Cybersecurity Certificate (CIS.CYS.CT) (http://catalog.oaklandcc.edu/programs/computer-information-systems/cybersecurity-option-ct)
- Computer Information Systems - Information Technology Support Certificate (CIS.ITS.CT) (http://catalog.oaklandcc.edu/programs/computer-information-systems/tech-support-option-ct)
    - Computer and Systems Support Focus Area *or*
    - Database Technology and Administration Focus Area *or*
    - Network Technology and Administration Focus Area
- Computer Information Systems - Software Engineering Certificate (CIS.SWE.CT) (http://catalog.oaklandcc.edu/programs/computer-information-systems/software-engineering-option-ct)
    - Game Design and Development Focus Area *or*
    - General Software Development Focus Area *or*
    - Mobile Application Development Focus Area *or*
    - Web Application Development Focus Area

- Computer Information Systems - Web Designer Certificate (CIS.WDE.CT) (http://catalog.oaklandcc.edu/programs/computer-information-systems/web-designer-option-certificate)

Certificate of Achievement

- Cisco Internetworking Certificate of Achievement (CIS.CIN.CA)

Computer Information Systems Courses

CIS 1000   Computer Literacy   .... 1 Credit Hour
English/ESL Placement: Placement into ENG 1055 or higher (or placement into ESL 1011 or higher for students taking the ESL sequence of courses.)
Note: DUE TO FEDERAL REGULATION THIS COURSE MAY NOT BE ELIBIGLE FOR FEDERAL FINANCIAL AID. PLEASE CHECK WITH YOUR FINANCIAL AID OFFICE.
Students will be provided an understanding of fundamental computer concepts and personal computer operation. Students will utilize a personal computer to acquire basic skills necessary to power up a computer and access common computer programs. Topics to be covered include elementary word processing, system commands and operation, and general computer concepts. Students will be required to complete computer-based assignments outside of class. BILLABLE CONTACT HOURS: 1

CIS 1050   Personal Computer Productivity Tools   ..... 4 Credit Hours
Equivalent: DPR 1030,DPR 1010
English/ESL Placement: Placement into ENG 1060 or higher (or placement into ESL 2510 or higher for students taking the ESL sequence of courses).
Students will be introduced to the essentials of personal computer usage. Students will explore and utilize software products such as business graphics, Internet usage, spreadsheets, databases, and word processing. Material in this course will assist students in the use of common desktop productivity tools used by most other disciplines. Consult the footnotes in the Schedule of Classes for information on the software package being used in specific sections. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 1060   Personal Computer Spreadsheet Concepts   ..... 3 Credit   Hours
Equivalent: DPR 1060
English/ESL Placement: Placement into ENG 1510.
Students will use a personal computer spreadsheet package to solve problems and develop solutions that lend themselves to the spreadsheet environment. Topics covered include spreadsheet menus, macros, charting, importing data files, graphics facilities, data tables and creating web pages. Consult the coursenote in the Schedule of Classes for information on the software package being used in specific sections. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 3

CIS 1070   Personal Computer Presentation Concepts   ..... 3 Credit   Hours
English/ESL Placement: Placement into ENG 1510.
Students will utilize a personal computer presentation package to create software-based slide show presentations. Topics covered include planning an effective slide presentation; creating and editing a presentation by adding, deleting and modifying slides and slide content; creating tables and charts; using design templates; adding transition, animation and sound effects; and inserting clip art. Linking and embedding objects from other programs, setting up a self-running presentation and setting up a presentation to run on another computer will also be covered. Consult the Schedule of Classes for information on the software package being used for the course. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 3

CIS 1080   Personal Computer Database Concepts   ..... 3 Credit Hours
Equivalent: DPR 1080
English/ESL Placement: Placement into ENG 1510.
Students will use a personal computer database package to implement database solutions in common application areas involving personal computers. Topics covered include relational database concepts, menus, queries, report writing features, screen design, importing and exporting data files, macros and creating hyperlinks and web pages. Consult the course notes in the Schedule of Classes for information on the software package being used in specific sections. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 3

CIS 1090   Web Graphic Concepts   .... 3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
This course will introduce students to the fundamental concepts, techniques and tools for understanding, creating and manipulating graphics (image files) suitable for use on web pages. Students will learn to use a graphics editor to create image based web components such as banners, buttons, GIF animation, splash page graphics, montages and will also learn to integrate those components to create an overall interface for a website. Students will learn about file formats, image compression techniques, web page typography, color choices for web pages as well as layout and composition for web-based projects. Students will create a web-based portfolio of all the graphics created during the course of the semester. BILLABLE CONTACT HOURS: 3

CIS 1100   Fundamentals of Information Systems   ..... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
This course provides an overview of business information systems and aims to present the central information systems principles, and demonstrate how they form an integral part of modern organizations. Topics include computer hardware and software fundamentals, use of software packages, an introduction to the Internet, systems analysis, the design of management information systems, as well as the impact of computers on business and society. The students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 1200   Introduction to Database Systems   ...... 4 Credit Hours
Equivalent: DPR 1200
English/ESL Placement: Placement into ENG 1510.
This course will focus on the fundamentals of database systems. Students will study the basics of database vs. file management systems; functions, components, and personnel involved in a database; database, client-server, and transaction processing architectures; and relational data models and operations. Students will also study business requirements analysis, perform data definition, manipulation, and queries using basic SQL, create forms and reports; and analyze macros, procedures and triggers. Concepts of database planning, design, and administration fundamentals, data warehousing, and data mining will be covered. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 1295   Voice and Data Cabling   .... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Students will become familiar with cabling issues related to data and voice connections, media (copper and fiber) and transmissions practices, and cabling customer support. This course stresses documentation, design and installation issues, laboratory safety and on-the-job safety, as well as working effectively in group environments. BILLABLE CONTACT HOURS: 4

CIS 1300   Networking Concepts   .... 4 Credit Hours
Equivalent: CIS 2710
English/ESL Placement: Placement into ENG 1510.
Students will explore the components of networks and network designs. Communications hardware and the interconnection of servers and clients within LANs and WANs will be presented. Network architectures, standards, protocols and access methods used within intranets and the Internet will be described. The functions of network operating systems such as Windows Server, Unix, and Novell NetWare will be explored. Centralized computing, client/server and peer-to-peer environments, their services and their program-to-program communication protocols will be presented. Data security and system component protection will be studied. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 1305   CCNA Studies I: Introduction to Networks   ..... 4 Credit   Hours
English/ESL Placement: Placement into ENG 1510.
This course is the first of four courses training students on the topics tested in CCNA (Cisco Certified Network Associate) certificate. Introduces the architecture, structure, functions, components, and models of the Internet and computer networks. The principles of IP addressing and fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. BILLABLE CONTACT HOURS: 4

CIS 1310   CCNA Studies II: Routing and Switching Essentials   .... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1305 or consent of instructor.
This course is the second of four courses training students on the topics tested in CCNA (Cisco Certified Network Associate) certificate. Describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. BILLABLE CONTACT HOURS: 4

CIS 1320   CCNA Studies III: Scaling Networks   .... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1310
This course is the third of four courses training students on the topics tested in CCNA (Cisco Certified Network Associate) certificate. Describes the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP, and VTP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement DHCP and DNS operations in a network. BILLABLE CONTACT HOURS: 4

CIS 1330   CCNA Studies IV: Connecting Networks   ..... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1320
This course is the fourth of four courses training students on the topics tested in CCNA (Cisco Certified Network Associate) certificate. Discusses the WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students also develop the knowledge and skills needed to implement IPSec and virtual private network (VPN) operations in a complex network. BILLABLE CONTACT HOURS: 4

CIS 1400   Web Design I   .... 4 Credit Hours
Equivalent: CIS 1510,CIS 1110
English/ESL Placement: Placement into ENG 1510.
This course focuses on the fundamentals of web site content development. Students will be introduced to the fundamental HTML5 structure of a webpage and then proceed to creating pages using a professional web editing tool. Students will create a fully functional original website using the web design editing tool that has elements such as images, hyperlinks, cascading style sheets for formatting, tables and integration of certain multimedia elements such as sound files, videos and Flash objects. Discussions will include accessibility of the design, overall site maintenance and publishing using FTP technologies. Students taking this course should have working knowledge of Windows and basic knowledge of the Internet. BILLABLE CONTACT HOURS: 4

CIS 1420   HTML5 Programming   ....3 Credit Hours
Equivalent: CIS 2781
English/ESL Placement: Placement into ENG 1510.
This course focuses on designing and coding internet web pages using HTML5. The student will develop web pages by designing, entering, and testing code using this standard (with a simple text editor) rather than by using web development tools. Topics include - HTML5 element structure, web forms, multimedia, style sheets (CSS3) to apply formatting and layout characteristics in addition to applying special effects. This course will also include an introduction to the JavaScript programming language. Students should be familiar with the basics of both word processing and Windows file management techniques before enrolling in this course. BILLABLE CONTACT HOURS: 3

CIS 1440   JavaScript Programming for Websites   .....4 Credit Hours
Equivalent: CIS 1125
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1420
This course introduces the student to the fundamentals of JavaScript as a client-side scripting language for the purpose of developing dynamic Web-based applications that run within a Web browser. Emphasis is placed on programming techniques and Web technology. Topics include functions, data types, operators, strings, arrays, control structures, form validation, event handling, the Document Object Model, and debugging. Students should be familiar with fundamental computer usage, word processing, and HTML prior to enrolling in this class. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 1500   Introduction to Programming (Java)   ... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Students should have elementary Algebra skills and be familiar with both elementary word processing and Windows file management techniques prior to enrolling in this class. Students will be introduced to the fundamental techniques and syntax for understanding, designing, constructing, debugging, and testing object-oriented programs by studying the Java programming language. The structured programming basics of process, selection and iteration will be covered as well as primitive and complex data typing, methods, parameters and input/output. The basics of graphical user interface (GUI) programming such as event handling, windows and widgets will be introduced. Fundamental object-oriented concepts of classes, methods, abstraction, encapsulation and inheritance will also be introduced. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 1512   Principles of Software Engineering   ......3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
This course is focused on formal methods and approaches used in the design, development, testing and maintenance of computer software. Each stage of the software development life cycle (SDLC) will be studied in detail. Topics such as low-level design, high-level design, modeling with UML (Unified Modeling Language), iterative development models, rapid application development (RAD), formal testing methods, incremental deployment, formal metrics, as well as appropriate use of associated tools will be covered with practical applications. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 3

CIS 1550   Introduction to Secure Programming   . 3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
This course presents cybersecurity content related to analyzing software risks, understanding likely points of application attack, and making preliminary decisions about how software applications mitigate attack. The student will learn how to identify systemic threats in any deployment environment, understand the vulnerabilities of common software applications, and how to construct software that are responsive to identified vulnerabilities. BILLABLE CONTACT HOURS: 3

CIS 1600   Fundamentals of Cybersecurity   .... 4 Credit Hours
Equivalent: CIS 2839,CIS 2839
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1300
This course is designed for aspiring security professionals, system or network administrators, or other information technology professionals who want to learn about computer security. Students will be well prepared for the Security+ Exam after taking this class. This course focuses on General security concepts, Communication security, Infrastructure security, Basics of Cryptography, and Operational Organizational security. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 1610   Data Security   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1600
This course is focused on the structure of data and database systems, their vulnerabilities to cyber attacks, and the proper techniques required to protect these systems from damage. Material covered will include: analysis of database-related malware; data system architecture; database system installation and configuration; data access controls and authentication; data security tools and devices; and security testing and auditing. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 1620   Introduction to Cryptography   .... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1600
This course is focused on basic techniques of encryption and decryption and their application to computer security. Topics covered will include: basic number theory and finite field arithmetic used in cryptography; symmetric ciphers; asymmetric ciphers; block and stream ciphers; implementation of popular encryption algorithms (e.g., AES); hash algorithms; digital signatures; and key management and distribution. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 1630   Security Policy, Legal, Ethics and Compliance   ....3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1600
This course provides a comprehensive introduction to the identification, selection, assessment, and continuous monitoring of management controls that provide a cyber security governance structure throughout an organization and its supply chain. The course will emphasize security policies and frameworks, their organizational implications, to the psychology, ethics, and legal considerations of their implementation. BILLABLE CONTACT HOURS: 3

CIS 1720 Multimedia Data Management .... 4 Credit Hours
Equivalent: CIS 1001
English/ESL Placement: Placement into ENG 1510.
This course will give students a broad foundation in issues surrounding multimedia, including the role of and design of multimedia systems which incorporate digital audio, graphics and video, underlying concepts and representations of sound, pictures and video, data compression, transmission and storage, integration of media, multimedia authoring, and delivery of multimedia. Course will also include industry overview, societal issues, cultural implications, visual literacy and career opportunity. The students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 1721 Web Design II .... 3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
This course will provide students with intermediate to advanced skills in web publishing focusing on abilities to design web pages with variations in web browsers in mind. Students will continue to work with a web design editing tool and create pages that include forms, validation, and cascading style sheet based design layout. Students will create a website that is ADA (American Disabilities Act) compliant. Students should be familiar with elementary word processing and MS Windows file management techniques prior to enrolling in this class. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 3

CIS 1722 Web Animation ....3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
This course will provide introductory level knowledge of effectively working with vector based design applications aimed at the creation of animation, games, and interactive components for use on the internet. Students will focus on the creation of basic animation and navigation components for use on web sites as well as for projects aimed at offline use. Students taking this course should have basic Windows background and general knowledge of internet technologies. BILLABLE CONTACT HOURS: 3

CIS 1801 Special Topics I: Network Remediation .....3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Network Remediation. BILLABLE CONTACT HOURS: 3

CIS 1802 Special Topics I: Introduction to Cybersecurity and Risk Management .... 3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Introduction to Cybersecurity and Risk Management. BILLABLE CONTACT HOURS: 3

CIS 1803 Special Topics I .... 1-4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Students will be introduced to a particular contemporary topic or issue in information science that is relevant in today's environment. See footnotes in the current Schedule of Classes for current topics. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 1 - 4

CIS 1804 Special Topics I: Macro Media Director ..... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Macro Media Director. BILLABLE CONTACT HOURS: 4

CIS 1805 Special Topics I: Introduction to Adobe Creative Suite CS2 .... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Introduction to Adobe Creative Suite CS2. BILLABLE CONTACT HOURS: 4

CIS 1811 Special Topics II .... 1-4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Students will be introduced to a particular contemporary topic or issue in information science that is relevant in today's environment. See footnotes in the current Schedule of Classes for current topics. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 1 - 4

CIS 1812 Special Topics II .... 1-4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Students will be introduced to a particular contemporary topic or issue in information science that is relevant in today's environment. See footnotes in the current Schedule of Classes for current topics. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 1 - 4

CIS 1813 Special Topics II .... 1-4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Students will be introduced to a particular contemporary topic or issue in information science that is relevant in today's environment. See footnotes in the current Schedule of Classes for current topics. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 1 - 4

CIS 1814 Special Topics II .... 1-4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Students will be introduced to a particular contemporary topic or issue in information science that is relevant in today's environment. See footnotes in the current Schedule of Classes for current topics. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 1 - 4

CIS 1815   Special Topics II: Introduction to C Sharp Programming Language   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: The prerequisites for a specific special topics section will depend on the content of that section. See footnotes in the current Schedule of Classes for associated prerequisites.
Introduction to C Sharp Programming Language. BILLABLE CONTACT HOURS: 4

CIS 2111   Systems Analysis and Design (UML)   .. 4 Credit Hours
Equivalent: CIS 2030,DPR 2030
English/ESL Placement: Placement into ENG 1510.
Students should be familiar with the basics of both word processing and Windows file management techniques before enrolling in this course. Students will survey and practice the techniques used by system analysts and programmers in the analysis and design of computer-based business information systems with focus on the Unified Modeling Language (UML). Both traditional and object-oriented methods will be presented. System and object-oriented development life cycles (SDLC and ODLC) and subjects in computer-aided software engineering (CASE) such as project management, requirements modeling, data flow and entity relationship diagrams (DFD and ERD) and data dictionaries are among the included topics. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2115   Business Analysis and Processes   ......4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1050 CIS 1060 CIS 1200 and CIS 2111.
In this course emphasis will be placed on tools and techniques to help with the analysis and process of solving business problems with technology. This course will cover process analysis, process flow diagrams, data analysis, predictive analysis and modeling, data modeling, Entity Relationship Diagrams (ERD), data dictionary, data mapping and the software tools available. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2120   Problem Solving and Information Technology   ..... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1050 and CIS 1060.
This course demonstrates how information technology impacts organizations, with an emphasis on using information technology to solve problems and introduces the need for business processes and IT alignment. Topics include main concepts of information technology at a general level, on-line collaboration tools, application software, and information literacy as applied to searching and using the Internet. In addition, students will use application software at an intermediate level and apply it to problem solving scenarios. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2151   Object-Oriented Programming (Java)   . 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1500
Students will be exposed to more complicated programming problems and will study the techniques and structures used to solve these problems with the Java language. Topics will include multidimensional arrays and class design using both composition and inheritance. Advanced Graphic User Interface (GUI) design and implementation techniques will be discussed. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2212   Project Management   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Students should be familiar with the basics of both word processing and Windows file management techniques before enrolling in this course. This course focuses on management strategies and analysis of business information systems projects. Project management issues and techniques specific to projects will be emphasized. Emphasis is on creating plans and implementing projects that are within budget, on time, and deliver useful results. Technology and project management standards, design tools (e.g., UML), product evaluation criteria, infrastructure integration, and communication of technical implementation details will be covered in group discussion and project work. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2232   Fundamentals of System Support   ....4 Credit Hours
Equivalent: DPR 2050
English/ESL Placement: Placement into ENG 1510.
Students will be introduced to the basic software and hardware concepts and facilities needed for simple support tasks. Topics covered include system boot sequences, disk partitioning, disk fragmentation, system configuration files, types of memory and memory management, basic OS commands and batch file construction. Emphasis is given to the Windows OS relationships and facilities. Hardware factors related to system and software evaluation, selection, purchase and installation are presented. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2252   Object-Oriented Programming (C++)   .. 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Students should have a basic understanding of general programming concepts and techniques prior to enrolling in this class. Students will be instructed in the syntax and semantics of the ANSI C++ language. Topics covered include control structures, arrays, pointers, strings, dynamic memory management, class definition and object-based development, file I/O, overloading, exception handling, and template libraries. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2313   E-Business and E-Commerce   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Students should have a basic knowledge of Internet technologies before enrolling in this course. Introduction is provided to a broad range of theories, practices, standards, and procedures related to the strategic implementation of e-commerce systems aimed at supporting one or more organizational business initiatives. A series of topics will be presented and cases analyzed that teach the student material ranging from: e-commerce business models, e-commerce technologies, supporting standards, to ecommerce analysis and design methodologies. The students will be required to complete computerbased assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2333 **Web System Administration** .... **4 Credit Hours**
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1300
This course focuses on the operation and administration of Web application servers such as Apache HTTP, IIS, Tomcat and WebSphere. Students will study the basic structure and function of Web servers as well as the common tasks and services performed by administrators. Topics include Web protocols and related networking; Web server installation and configuration; integration with other essential services such as email, database management, file transfer, domain name services, and authentication; security; monitoring and performance; and virtualization. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2353 **Data Structures** .... **4 Credit Hours**
Equivalent: DPR 2810
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1500
Students will investigate the programming techniques and theories involved in implementing linked lists, queues, stacks and tree structures. Recursion, searching techniques and sorting algorithms will also be considered. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2434 **Introduction to Linux and Unix Administration** ..... **3 Credit** **Hours**
Equivalent: CIS 2332
English/ESL Placement: Placement into ENG 1510.
Students should be familiar with elementary word processing and basic computer concepts prior to enrolling in this course. This hands-on class covers the concepts related to Linux/Unix installation and system administration. Students will install and administer a Linux/Unix operating system using a virtual machine software product. It is intended for students who plan to work as Linux/Unix system administrators or for those who plan to take one or more certification tests as part of their professional preparation. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 3

CIS 2454 **Web System Development (PHP, Java)** ..... **4 Credit Hours**
Equivalent: CIS 1930
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1500 or CIS 2151
This course focuses on design and implementation techniques for Web-based application software. Server-side software design and development techniques associated with Web Developer job skills will be emphasized. Topics to be covered will include: Web application architecture; design patterns and application frameworks; PHP language basics; Java technologies for server-side Web development; database access; Extensible Markup Language (XML) and Asynchronous JavaScript and XML (AJAX)-based request processing; and Web application security. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2515 **Database Design and Management with Oracle SQL** .... **4 Credit Hours**
Equivalent: DPR 2830
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1200 or consent of instructor.
This course will focus on design and management of database environments using Oracle SQL and associated Oracle technologies. Topics include enterprise information resource planning and object-oriented and entity-relationship data modeling methodologies, normalization and the relational model, logical and physical database design, and implementation, population and processing of a relational database for data access, report generation, database definition, data manipulation, and access control. Oracle-specific materials used in this course are designed to prepare students for an Oracle Database SQL exam which is the first exam required to become an Oracle Certified Associate or Oracle Certified Professional. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2535 **Microsoft Windows Server Administration** ..... **3 Credit** **Hours**
English/ESL Placement: Placement into ENG 1510.
Students should be familiar with the basics of both word processing and Microsoft Windows file management techniques and basic hardware, software, and network operating system, architecture, and protocol concepts needed for simple support tasks prior to enrolling in this course. Concepts of electronic business communications and local area networks will be covered. The Microsoft Windows Server operating system will be used and studied in this course. Installation of network operating system, setup of users and groups, files and folder trustee rights, and console management will be covered. Students will be required to complete computer-based assignments inside/outside of class. This course covers material in and prepares students for the first part of Microsoft's MCSA and MCSE certification tracks. BILLABLE CONTACT HOURS: 3

CIS 2555 **Web System Development (ASP.NET, C#)** ..... **4 Credit Hours**
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 2757
Students should have a basic knowledge of Internet technologies before enrolling in this course. This course focuses on design and implementation techniques for Web-based application software. Server-side software design and development techniques associated with Web Developer job skills will be emphasized. Topics to be covered will include: Web application architecture; C# language basics; ASP.NET technologies for server- side Web development; database access; asynchronous JavaScript and JSON or XML-based request processing; and Web application security. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2616   Database Application Design and Development with Oracle PL/SQL   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1200 or consent of instructor.
This course will focus on design and development of database applications using Oracle PL/SQL, Oracle development tools, and use of Oracle XML data types for implementation of PL/SQL programs, procedures, functions, packages, and triggers. Oracle-specific materials used in this course are designed to prepare students for the Oracle Program with PL/SQL exam which is the second exam required to become an Oracle Certified Associate or Oracle Certified Professional. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2636   Network Administration   .... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1300
This course is designed for Information Technology professionals who want to learn advanced topics in network administration. Areas covered include topics like routing protocols, congestion control algorithms, Quality of Service. The student will also be exposed to network security, trouble shooting networks, remote access technologies like VPN and some router switch configuration. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2637   Big Data and NoSQL Systems   ....3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1200
This course is focused on the architecture, design, implementation and support of Big Data systems and non-traditional information retrieval techniques (i.e. techniques that do not use structured query languages). Topics covered include: characteristics and analysis of big data; big data life cycle; big data platforms and highly distributed file systems; big data processing and storage technologies; and NoSQL. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 3

CIS 2656   Visual Basic.NET Programming   .... 4 Credit Hours
Equivalent: CIS 1250,DPR 1250
English/ESL Placement: Placement into ENG 1510.
This course focuses on software design and development techniques with the Visual Basic .NET programming language. Topics to be covered will include: Overview of the Microsoft .NET architecture; user interface forms and controls; variables, arrays, procedures, and control structures; object-oriented programming techniques; exception handling; data access with ADO.NET; and simple integration with Web technologies. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2737   Database Administration   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1200
The purpose of the Database Administration course is to train students on typical activities performed by a database administrator (DBA) and on issues important to efficient performance of a database. The course will involve significant hands-on and lab work using the Oracle and/or MySQL server DBMS. Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2757   C# Programming   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Students should have a basic understanding of general programming concepts and techniques prior to enrolling in this class. This course focuses on the design and implementation of software using the C# programming language. Students will learn how to develop programs that utilize classes and objects, arrays, graphical user interfaces, event-driven programming and exception handling. Visual Studio .NET will be used as the primary integrated development environment. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2818   Mobile Application Development (Android)   .....4 Credit   Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1500 or consent of instructor.
This course focuses on the design and implementation of wireless handheld application software on the Android platform for business and personal use. Students will use the Android Studio integrated development environment (IDE) to develop and test application software. Development techniques will focus on operational aspects of mobile devices that distinguish them from PCs and general computing platforms. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2819   Mobile Application Development (iOS)   .....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
In this course, students will learn how to write computer software using the SWIFT programming language that runs on Apple iOS-based mobile devices. Topics covered will include: the iOS platform execution environment; basic SWIFT language features such as data types, conditional statements, iteration, data collections, classes, functions, and error handling; user interface design and event-based processing; persistent data management; and integration with local and remote services. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2838   System Security   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1600
This course is designed for aspiring security professionals, system or network administrators, or other information technology professionals who want to learn about computer security. Being a part of two courses, this part focuses on the security engineer who needs to worry about the attacks used by hackers and the defenses against them. The course makes an effort to understand defenses against Reconnaissance, Scanning, Gaining Access, Maintaining access and covering tracks. Last but not the least, the course covers computer ethics. The Students will be required to complete computer-based assignments inside/outside of class. BILLABLE CONTACT HOURS: 4

CIS 2845   Computer Forensics   ....4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1600
With ever growing reliance on computers for every day life projects, and increased focus on security and breach of security and privacy, there is a need for a course which can help security professionals and law enforcement agencies learn ways to investigate security breaches. This course is designed to introduce a variety of operating systems investigation techniques, incident response tactics, and legal issues. The course helps learn forensic techniques and tools for both Windows and Linux investigations. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2858   Web System Integration and Service Development   ....4 Credit Hours
Equivalent: CIS 2414
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 1500 or CIS 2151 or CIS 2454
This course focuses on design and implementation strategies for integration of distributed client-server software and development of Web application services. Topics to be covered will include: Web middleware-related technologies such as the Java Enterprise Edition platform (Java EE), multi-tier application frameworks; Extensible Markup Language (XML) processing; Simple Object Access Protocol (SOAP); Representational State Transfer (RESTful) Web services; Web Services Description Language (WSDL); and Cloud Computing services. Students will use a popular IDE tool to create and integrate Web application components. Completion of computer-based assignments inside and outside of class will be required. BILLABLE CONTACT HOURS: 4

CIS 2859   Foundations of Game Software Development   .....4 Credit   Hours
English/ESL Placement: Placement into ENG 1510.
Students should have a basic understanding of object-oriented programming prior to enrolling in this class. This course focuses on the fundamentals and techniques of game software development. Students will use a popular game engine and associated software tools to learn how various elements of games are created, integrated into a system, and used in game play. Game system elements include: game engine functions; scripts; graphical interface; models; terrains and worlds; textures; sound; and support infrastructure. Students will also apply mathematical foundations used in computer graphics. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 4

CIS 2862   Game Design   ....3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
This course is focused on the essential principles of designing game software. The philosophy of video games as a form of entertainment as well as important design concepts that feature player-centric approaches will be explored. Other topics to be covered include: the genres of games; design components and processes; game analysis frameworks; storyboarding; creative and expressive play; character development; storytelling and narrative; game play mechanics; defining appropriate physical models and game worlds; and level design. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 3

CIS 2901   CIS Internship/Co-Op I   .... 4 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: 19 CIS credit hours.
Prerequisite: Consent of instructor.
The student will be employed in an industry position that relates to specific career goals. Appropriate meeting and student reporting times will be arranged at the college for faculty/coordinator guidance. Students will work a minimum of 12 hours per week at a worksite. Entrance into this course will be on a limited basis depending upon industry positions available. Opportunities may include worksite assignments that foster relationships with sponsoring organizations and create possible carryover internship/co-op tracks with other educational institutions. The CIS department must approve the worksite assignment prior to enrollment. BILLABLE CONTACT HOURS: 4

CIS 2980   Computer Service Technologies & Techniques A + ...4 Credit Hours
Equivalent: ECT 2150
English/ESL Placement: Placement into ENG 1510.
Prerequisite: CIS 2232 or consent of instructor.
This course provides the necessary preparation to take the industry standard Core Hardware Certification exams. Topics studies include, but are not limited to: core hardware requirements, installation, configuration and upgrading, diagnosing and troubleshooting, preventive maintenance, motherboard/processors/memory, basic networking and security. Students will be required to complete computer-based assignments outside of class. Note: certification exams are administered and charged separately by an outside agency. BILLABLE CONTACT HOURS: 4

CIS 2991   Special Project in Software Engineering   .....3 Credit Hours
English/ESL Placement: Placement into ENG 1510.
Prerequisite: Successful completion of all required core courses in the CIS.SWE.CT CIS Software Engineering Certificate program: CIS 1200 CIS 1500 CIS 1512 and CIS 2353.
Prerequisite: Complete a minimum of 6 credits in one focus area of the CIS.SWE.CT CIS Software Engineering Certificate program.
This course is focused on development of material for a personal 'software' portfolio that may be used to support employment opportunity applications. Common tools and techniques used in work environments as well as typical workplace processes will be explored with the purpose of preparing students for employment as software developers. Students will be required to complete computer-based assignments inside and outside of class. BILLABLE CONTACT HOURS: 3