**COMPUTER AND INFORMATION TECHNOLOGY**

The Certificate in Microcomputer Applications is designed for students interested in microcomputer operations and systems. Upon completion, students are prepared to take the Microsoft Office Specialist certification exams in Word and Excel.

The Associate of Applied Science Degree in Computer and Information Technology equips students for employment which involves the analysis and design of computerized information and management decision systems. Graduates of the program are prepared to take the CompTIA A+ certification exam which demonstrates competency in the maintenance of PCs, mobile devices, operating systems and printers. The program is broken down into three concentrations. Students must take 15 credit hours in one of the following concentrations to obtain their degree in that field: IT Specialist Concentration, Networking Concentration or Programming Concentration.

**Graduation Requirements**

**Certificate in Microcomputer Applications**: WorkKeys® scores of level 5 in Reading for Information, level 4 in Locating Information, and level 5 in Applied Mathematics; cumulative GPA of 2.0 or higher; the last 15 credits taken at NMSU.

AAS in Computer and Information Technology: ENGL 111G Rhetoric and Composition with a C or higher; placement into college-level math and reading courses or completion of developmental courses with a C or higher; cumulative GPA of 2.0 or higher; the last 15 credits taken at NMSU.

Microcomputer Applications - Certificate (http://catalogs.nmsu.edu/carlsbad/associate-degree-certificate-programs/computer-information-technology/microcomputer-applications-certificate)

Gainful Employment Disclosure: Important information about the educational debt, earnings, and completion rates of students who attend this program can be found on the following Gainful Employment Disclosure (https://carlsbad.nmsu.edu/about-us/gainful-employment)

Computer and Information Technology - Associate of Applied Science (http://catalogs.nmsu.edu/carlsbad/associate-degree-certificate-programs/computer-information-technology/computer-and-information-technology-associate-applied-science)

**OECS 101. Computer Basics**  
1 Credit  
Hands-on instruction to introduce computer use and commonly used software. Graded S/U.

**OECS 105. Introduction to Information Technology**  
3 Credits  
Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communication, data analysis, information management and decision-making. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

**OECS 108. Operating Systems**  
3 Credits  
Installation, configuration and optimization of computer operating systems. Restricted to: Community Colleges only.

**OECS 109. Operating Systems**  
3 Credits  
Introduction to operating systems. Restricted to: Community Colleges only.

**OECS 110. Introduction to Power Point**  
1-3 Credits (1-3)  
An introduction to Power Point software to develop business presentations. Includes concepts of basic presentation methods and graphic design principles. Students will create and deliver presentations using text, charts, digitized images, and sound. Restricted to Community Colleges campuses only.

**OECS 125. Operating Systems**  
1-3 Credits  
Installation, configuration and optimization of current operating systems. Restricted to: Community Colleges only.

**OECS 128. Operating Systems Linux/Unix**  
3 Credits  
Installation, configuration, and use of Linux/Unix operating system software and utilities including hardware management, file management, use of command line, and scripting. Restricted to: Community Colleges only.

**OECS 140. Introduction to Game Production Industry**  
1-3 Credits (1-3)  
Students explore the business behind game production, understanding how game companies are organized and funded, positions within the game industry, and what skills game producers need. Restricted to Community Colleges campuses only.

**OECS 141. Introduction to Interactive Game Programming**  
1-3 Credits (1-3)  
This introductory programming class reviews the basics of programming, including the object-oriented approach. Students will de-construct existing games, develop their own code, and gain an appreciation for coding strategies. May be repeated for a maximum of 6 credits. Restricted to Community Colleges campuses only.

**OECS 145. Mobile Application Development**  
1-3 Credits (1-3)  
Introduction to elements of mobile application coding including concepts, design strategies, tools needed to create, test and deploy applications for mobile devices. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

**OECS 150. Visual Basic Programming**  
3-4 Credits (3-4)  
Introduction to algorithmic problem-solving concepts, structured programming design-oriented application programing interface development. Solutions to problems are implemented using the Visual Basic programming language in the Windows environment, with connection to Access databases as applicable.

Prerequisite(s)/Corequisite(s): OECS 220. Restricted to Community Colleges campuses only.

**OECS 155. Special Topics - Introductory Computer Technology**  
0.5-4 Credits (.5-4)  
Topics to be announced in the Schedule of Classes. May be repeated up to 8 credits.

**OECS 185. PC Maintenance and Repair I**  
1-3 Credits  
Introduction to most common types of PC configurations, installations, and failures. This course will explore troubleshooting skills for maintaining and repairing common hardware and software related problems. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.
OECS 192. C++ Programming I

3 Credits
Development of skills in programming using the C++ programming language. Restricted to: Community Colleges only.

OECS 195. Java Programming I

1-3 Credits
Developing of skills in programming using the Java programming language. Restricted to: Community Colleges only.

OECS 200. Accounting on Microcomputers

3 Credits
Fundamental accounting principles using popular microcomputer software to include G/L, A/R, A/P, purchase order, billing, inventory, and forecasting modules.
Prerequisite: ACCT 221 or BOT 121.

OECS 203. UNIX Operating System

1-3 Credits
Introduction to the UNIX operating system using Telnet to access a remote UNIX system. Basic UNIX commands and file system concepts.
Prerequisite: C S 110, BCIS 110 or OECS 105.

OECS 204. Linux Operating System

1-3 Credits
Install and configure the Linux operating system on X86 systems. Covers issues involved in maintaining operating system, networking, creating and managing users, and installing and updating software. General procedures for working with operating system includes maintaining disk space, preserving system security, and other related topics. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

OECS 205. Advanced Operating Systems: Administration

3 Credits
Examines operating systems designed for PC, minicomputers and mainframes. Covers maintaining operating systems, creating and managing users, and installing and updating software. General procedures for working with operating systems will include maintaining disk space, preserving system security, providing mail services, among other topics. May be repeated for a maximum of 6 credits.
Prerequisite: OECS 128.

OECS 207. Windows

0.5-3 Credits
Covers local installation, configuration of core local services, managing users, and the general local management and maintenance of Windows workstations. May be repeated up to 6 credits.
Prerequisite(s)/Corequisite(s): OECS 185. Prerequisite(s): Restricted to Community Colleges campuses only.

OECS 208. Internet Applications

1-3 Credits
Survey of the Internet to include e-mail, file transfer, current search techniques, the World Wide Web and basic Web page development. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

OECS 209. Computer Graphic Arts

1-3 Credits
Basic graphics composition using computer programs to include editing and manipulating graphic images, clip-art, and printing of pictures. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes.
Prerequisite: OECS 105, C S 110, or OECS 101.

OECS 211. Word Processing Applications

1-3 Credits
Basic word processing to include composing, editing, formatting, and printing of documents. May be repeated under different subtitles listed in the Schedule of Classes for a maximum of 6 credits.
Prerequisites: C S 110, BCIS 110 or OECS 105.

OECS 213. Image Processing

1 Credit
Introduction to digital imaging acquisition and editing. Use of digital cameras and computer graphic software for business and personal use. Graded S/U.
Prerequisites: C S 110, BCIS 110 or OECS 105.

OECS 214. Creating a Web Page

1 Credit
Introduction to creating Web pages for business and personal use. Graded S/U.
Prerequisites: C S 110, BCIS 110 or OECS 105.

OECS 215. Spreadsheet Applications

1-3 Credits
Use of spreadsheets to include graphics and business applications. May be repeated for a maximum of 6 credits.
Prerequisites: C S 110, BCIS 110 or OECS 105.

OECS 216. Programming for the Web

3 Credits
Designing web-based applications using appropriate programming language(s) such as, but not limited to HTML, PHP, MySQL, SQL, Java, Perl, C or C++. May be repeated up to 6 credits. Restricted to: Community Colleges only.
Prerequisite(s): One semester of any programming course.

OECS 220. Database Application and Design

1-3 Credits
Creating, sorting, and searching of single and multifile databases to include report generation and programming database commands. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes. Restricted to: Community Colleges only.
Prerequisite(s): C S 110 OR BCIS 110 OR E T 120 OR E T 122 OR OECS 105.

OECS 221. Internship I

1-3 Credits
Work experience that directly relates to a student’s major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.
Prerequisite(s): Consent of instructor.

OECS 222. Internship II

1-3 Credits
Continuation of OECS 221. Each credit requires specified number of hours of on-the-job work experience. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 221 and consent of instructor.
OECS 227. Computer Applications for Technicians
3 Credits
Computer applications for service technicians in various disciplines. Hardware and software applications explored. Includes operating systems, high level programming, and networking hardware and software.

OECS 230. Data Communications and Networks I
1-3 Credits
Definition of data communication; survey of hardware applications and teleprocessor software; examination and design of networks. May be repeated for a maximum of 6 credits.
Prerequisite: OECS 185.

OECS 231. Data Communications and Networks II
1-3 Credits
Installation and application of popular microcomputer network software. May be repeated for a maximum of 6 credits.
Prerequisite: OECS 230.

OECS 232. Implementing and Supporting Networks I
3 Credits
Knowledge and skills relating to post-installation and day-to-day administration tasks in a single-domain or multiple-domain network.
Prerequisite: OECS 230 or OECS 261.

OECS 234. Linux Server
3 Credits
This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Linux Server(s). It provides in-depth, hands-on training for planning, implementation, management and support of Linux networking services. May be repeated up to 6 credits.
Prerequisite(s): OECS 128, OECS 203 or OECS 204.

OECS 235. Structured Query Language (SQL)
1-3 Credits
Installation, configuration, administration, and troubleshooting of SQL client/server database management system. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): OECS 220. Restricted to Community Colleges campuses only.

OECS 237. Windows Server
3 Credits
This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Microsoft Windows Server Active Directory Domain Services in medium to large businesses. It provides in-depth, hands-on training for Information Technology (IT) professionals responsible for the planning, implementation, management, and support of Windows Active Directory services. Restricted to: Community Colleges only.
Prerequisite(s): OECS 207.

OECS 245. Game Programming I
3 Credits
Development of programming skills for games and animation using current programming languages and tools. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

OECS 246. Game Programming II
3 Credits
Continuation of OECS 245. May be repeated for a maximum of 6 credits.
Prerequisite: OECS 245.

OECS 250. Systems Analysis and Design I
3 Credits
Analysis, configuration, design and testing of organizations' work flow as it relates to hardware, software, data, procedures and personnel. Systems Life Cycle approach matching end users' needs to feasible financial, technical and operational solutions. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 220.

OECS 255. Special Topics
1-4 Credits
Topics to be announced in the Schedule of Classes.

OECS 260. Hypertext Markup Language (HTML)
1-3 Credits
Coverage of HTML as used for web-page development for Internet and Intranet. Text manipulation, graphics, hypertext links, lists, and tables. May be repeated for a maximum or 3 credits.
Prerequisite: C S 110, BCIS 110 or OECS 105.

OECS 261. Introduction to Networks
3-4 Credits (3-4)
Introduction to networking principles including the practical and conceptual skills for understanding basic networking, planning and designing networks, implementing IP addressing schemes, examining the OSI and TCP/IP layers, and performing basic configurations for routers and switches. Aligns to the first course of the Cisco Networking Academy CCNA curriculum. Restricted to Community Colleges campuses only.

OECS 262. Essentials of Routing and Switching
3-4 Credits (3-4)
Examination of the architecture, components, and operations of routers and switches in a small network. Student will learn how to configure, verify and troubleshoot: routers and switches, static routing, default routing, VLANs, and ACLs. Aligns to the second course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 261.

OECS 263. Network Fundamentals
3-4 Credits (3-4)
Fundamentals of networking architecture, components, and operations including practical and conceptual skills using routers and switches. Student will learn how to configure, verify and troubleshoot static routing, default routing, VLANs, and ACLs. Aligns to the third course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 262.

OECS 264. Network Routing Protocols
3-4 Credits (3-4)
Fundamentals of routing protocols for troubleshooting advanced network operations. Covers common networking issues such as RIP, OSPF, and EIGRP for IPv4 and IPv6 networks. This course aligns to the fourth course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 263.

OECS 269. Network Security
3-4 Credits (3-4)
Fundamentals of design and implementation of network security solutions that will reduce the risk of system vulnerability. May be repeated up to 8 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 204 or OECS 207 or OECS 261 or consent of instructor.
OECS 275. PC Maintenance and Repair II
1-3 Credits
Continuation of OECS 185. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 185.

OECS 280. Desktop Publishing I
3 Credits
Design and production of publication materials to fill the needs of business communities, using a microcomputer. May be repeated for a maximum of 6 credits. Same as BOT 280.
Prerequisites: either BCIS 110, C S 110, OECS 105.

OECS 290. Computer Technology Capstone
1-3 Credits
Refines skills learned in the OECS program. Culminates in a review and practice of advanced software applications. May be repeated up to 3 credits. Restricted to: OECS & OECT majors. Restricted to Community Colleges campuses only.
Prerequisite(s): (OECS 125, OECS 128, OECS 207, OR OECS 203) AND (OECS 185 OR E T 283).

OECS 299. Independent Study
1-3 Credits
Specific subjects to be determined based on need. DAS Occupational Education, Dental Assisting. Restricted to: Community Colleges only.