

## Computer & Information Technologies

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### Competencies

#### General Education

Students should prepare for twenty-first century challenges by gaining:

- A. Knowledge of human cultures and the physical and natural worlds through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts.
- B. Intellectual and practical skills, including
  - inquiry and analysis
  - critical and creative thinking
  - written and oral communication
  - quantitative literacy
  - information literacy
  - teamwork and problem solving
- C. Personal and social responsibility, including
  - civic knowledge and engagement (local and global)
  - intercultural knowledge and competence
  - ethical reasoning and action
  - foundations and skills for lifelong learning
- D. Integrative and applied learning, including synthesis and advanced accomplishment across general and specialized skills.

#### Program Title: Computer & Information Technologies—Core

Upon completion of this program, the graduate can:

1. Use fundamental computer literacy knowledge including concepts and basic productivity software packages.
2. Use a graphical user interface with a working knowledge of at least one operating system.
3. Install, use, and maintain systems software and applications software.
4. Analyze, design, implement, and document simple applications.
5. Resolve technical questions using existing documentation.
6. Write end-user documentation using technical resources.
7. Employ basic diagnostic tools to identify and solve hardware and software problems.
8. Utilize logical, mathematical, and analytical skills to facilitate problem solving.
9. Discuss ethical and legal issues in computing such as privacy, corporate property, copyright, and security of software, hardware, and information.
10. Demonstrate the concept of management information systems, including security of software, hardware, and information.

11. Communicate with appropriate individuals (programmers, vendors, management, and users) in developing a team approach to problem solving.
12. Demonstrate and use network applications.
13. Implement basic computer system security measures.

**Program Title: Computer & Information Technologies—Applications Track**

Upon completion of this program, the graduate can:

1. Evaluate, select, customize, and maintain software and hardware
2. Demonstrate proficiency in the use of application software
3. Demonstrate a fundamental knowledge of business principles and practices
4. Business Software Specialist
  - a. Demonstrate proficiency in the use of advanced application tools
  - b. Assist others in the use of computer systems and software, including face-to-face professional communication and the development of training material
  - c. Demonstrate an understanding of designing, querying, and updating a database using SQL
5. Computer Support
  - a. Demonstrate proficiency in the use of advanced application tools
  - b. Assist others in the use of computer systems and software, , including face-to-face professional communication and the development of training material
  - c. Demonstrate proficiency in the use of Help Desk tools, technology and techniques
  - d. Demonstrate a methodical approach to the problem-solving process
6. Geographic Information Systems
  - a. Understand basic and advanced concepts relating to Geographic Information Systems
  - b. Use current Geographic Information Systems software to analyze maps
  - c. Use database programming to alter and enhance new and existing databases
7. Software Support
  - a. Demonstrate proficiency in the use of advanced application tools
  - b. Assist others in the use of computer systems and software, , including face-to-face professional communication and the development of training material
  - c. Use database programming to alter and enhance new and existing databases
  - d. Use writing and research skills to understand technical manuals and help files.

**Program Title: Computer & Information Technologies- Information Security Track**

Upon completion of this program, the graduate can:

1. Explain the fundamental principles of information security.
2. Prepare for the common attacks and exploits against computers and networks.
3. Apply data security methodologies in situational cases to scan network computers and applications for vulnerabilities.
4. Configure firewalls and other perimeter defenses against attacks.
5. Install and configure intrusion detection software.
6. Describe basic functions of the Linux operating system.
7. Demonstrate a working knowledge of an elective security topic, such as operating system security, network security, computer forensics, or another selected security topic.
8. Recognize and recall major elements and methods of securing networks and workstations.
9. Identify basic attributes, purposes, and functions of network components including wireless technologies.
10. Assess the security needs of computer and network systems to recommend safeguard solutions for maintenance of security devices, systems, and procedures.

**Program Title: Computer & Information Technologies—Internet Technologies Track**

Upon completion of this program, the graduate can:

1. Use HTML and CSS in page layout.
2. Utilize principles of graphic and content creation for online media.
3. Design and develop integrated web database applications such as inventory, billing, and shipping.
4. Web Programming
  - a. Design and develop programs using primitive data types in a web programming language.
  - b. Create interactive web pages utilizing client side and server side scripting.
5. Web Administration
  - a. Install and configure and maintain a web server.
  - b. Use knowledge of Internet protocols to support and troubleshoot Internet services.

**Program Title: Computer & Information Technologies—Network Administration Track**

Upon completion of this program, the graduate can:

1. Set up and manage user accounts including e-mail and Internet capability.
2. Install and maintain vendor-specific network components including servers, workstations, printers and communication infrastructure.
3. Analyze business information needs and design vendor-specific network solutions to enhance productivity and competitiveness.
4. Explain how the OSI (Open Systems Interconnection) model relates to development and troubleshooting of network communications.
5. Implement TCP/IP (Transmission Control Protocol/Internet Protocol) addressing and subnetting schemes.
6. Design communications solutions in an enterprise environment.
7. Implement a disaster recovery protection plan.

**Program Title: Computer & Information Technologies—Network Technologies Track**

Upon completion of this program, the graduate can:

1. Describe the communication protocols for computer networks.
2. Use a platform-specific network operating system to create and manage user accounts.
3. Use a platform-specific network operating system to share and secure resources.
4. Use a platform-specific network operating system to establish and maintain Internet connections.
5. Implement advanced network security measures

**Program Title: Computer & Information Technologies—Programming Track**

Upon completion of this program, the graduate can:

1. Demonstrate proficiency in problem solving and critical thinking skills in programming.
2. Demonstrate proficiency in programming.
3. Demonstrate proficiency in productivity software.
4. Demonstrate proficiency in written and electronic communications as they relate to program documentation.

**Program Title: Computer & Information Technologies—Computer Science Track**

Upon completion of this program, the graduate can:

1. Utilize fundamental programming techniques such as structured programming and object-oriented programming.
2. Develop advanced programs using high-level data structures such as lists, stacks, queues, trees, and graphs.
3. Use software engineering skills to solve system-level computing problems.
4. Utilize proof techniques to establish the truth of propositions including program correctness.