Computer & Information Technologies

Credentials/Credit Hours:
Degrees:
AAS

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Description:
COMPUTER & INFORMATION TECHNOLOGIES

With tracks in Applications, Internet Technologies, Network Technologies, Programming, and Computer Science

This program includes tracks in Applications, Information Security, Internet Technologies, Network Administration, Network Technologies, and Programming, with a core of courses common to all. The core includes a general education component essential to a collegiate education and a technical component giving students an introduction to information systems, computer applications, program development, system maintenance, networking, security, Internet technologies, database design, and collaborative system development. In addition to core courses, students take specialty courses for their selected track.

- Students graduating with a degree or certificate in Computer & Information Technologies may only use a course with a grade of "C" or higher (or a "Pass" for Pass/Fail courses) to fulfill a core or track graduation requirement.
- The Computer & Information Technologies department does not accept non-General Education courses older than 5 years from returning or transfer students without consent from the local program coordinator.
- Students may not use one course to fulfill multiple requirements.

The **Applications track** emphasizes several aspects of application software. It includes such productivity applications as: word processing, spreadsheets, database management, presentation, geographic information systems, website

development/maintenance, and help desk tracking systems. Completion of this track will prepare students to work with computer-based systems in business and industry.

Business Software Specialist - Designed to train students to operate a wide variety of software packages and to assist businesses in developing and maintain databases, producing financial statements, and developing applications using various software packages

Computer Support - Provides an in-depth knowledge of application software, computer system configurations, Help Desk Tools/Software, end-user documentation, user training, and other user support skills.

Geographic Information Systems - Provides students with practical GIS skills and a solid foundation for geographical manipulation through developing and implementing GIS Applications.

Software Support - Provides an in-depth knowledge of application software, computer system configurations, and data driven websites.

The **Information Security track** will provide a solid background in information security. Fundamentals of information security, offensive and defensive techniques, and security topics such as operating system security, network security design, or other security topics are covered. This track will help prepare students for entry-level positions of network security, auditing and penetration testing, firewall configuration, and computer crime investigation.

The **Internet Technologies track** prepares students to design, program, and maintain Internet-based services. With specializations in web programming and web server administration, this track will help prepare students for positions developing and maintaining interactive web sites.

The **Network Administration track** provides the concepts and skills needed to design, set-up, maintain and expand network and telecommunications systems. The curriculum provides specific training in Cisco, and/or Microsoft network systems. Upon completion of the track, the graduate will be qualified to take industry designed and recognized certification examinations. Employment opportunities include entry-level positions in installation and administration of local and wide area networks in medium to large businesses and organizations, and computer network administration positions in small businesses.

The **Network Technologies track** provides the concepts and skills needed to set up, maintain, and expand networked computer systems. This track requires sequences in Microsoft Windows, Cisco, and UNIX/Linux as well as courses providing deeper insight into Internet protocols and network security. Employment opportunities include entry-level positions in installation and administration of local area networks in medium to large organizations and as computer network administrators in small businesses.

The **Programming track** prepares students to design, develop, and maintain computer programs written in current and emerging programming languages. With tracks in Information Systems and Software Development, students successfully completing this track are prepared for entry-level positions in computer programming.

Information Systems - This track is designed with an emphasis on programming for a business environment. Students completing the Information Systems track study basic business concepts, one programming language at an advanced level, and two programming languages at an introductory level.

Software Development - This track emphasizes computer software development. Students completing the Software Development track study a minimum of two computer programming languages at an advanced level and additional programming language(s) at an introductory level. Flexibility within this track allows students to focus on a specific area of software development by means of the programming languages they choose to study (object-oriented programming, database programming, game development, etc.).

The **Computer Science track** prepares students interested in an advanced study of computer programming. The curriculum couples the study of programming with computer science concepts such as computational complexity, advanced data structures, and proof techniques. The curriculum may also be used to prepare students for entry into bachelor-level programs in computer science

- Students graduating with a degree or certificate in Computer & Information Technologies may only use a course with a grade of "C" or higher (or a "Pass" for Pass/Fail courses) to fulfill a core or track graduation requirement.
- The Computer & Information Technologies department does not accept non-Gen Ed courses older than 5 years from returning or transfer students without consent from the local program coordinator.
- Students may not use one course to fulfill multiple requirements.

Computer Technician Certificate

The Computer Technician Certificate offers students the opportunity to earn a credential demonstrating computer technician competencies. This certificate consists of the core skills that students need to achieve the industry A+ and Security+ certifications. In addition, this certificate will provide a way for professionals currently in the industry to update their technician skills and for new students to show progress in the CIT program.

CIT Fundamentals Certificate

The CIT Fundamentals Certificate offers students the opportunity to earn a credential demonstrating basic competency in the area of computers. The certificate consists of a natural progression of classes that are required for the Associate in Applied Science degree in Computer & Information Technologies. It gives those who are unable, or do not need, to complete a degree a way of demonstrating their level of computer proficiency.

Productivity Software Specialist Certificate

The Productivity Software Specialist Certificate offers students the opportunity to earn a credential demonstrating productivity software competencies. This certificate consists of the core skills that students need to effectively use various productivity software products. In addition, this certificate will provide a way for professionals currently in the industry to update their productivity software skills and for new students to show progress in the CIT program.

Computer Tech Basic Certificate

The Computer Tech Basic Certificate offers students the opportunity to earn a credential demonstrating basic competency in the area of computer information technology. The certificate consists of a natural progression of classes that are required for the Associate in Applied Science degree in Computer & Information Technologies. It gives those who are unable, or do not need, to complete a degree a way of demonstrating their level of computer proficiency. The Computer Tech Basic Certificate prepares students for the CompTIA A+ and Net+ certification exams which are recognized by the computer industry around the world.

Computer Support Technician Certificate

The Computer Support Technician Certificate offers students the opportunity to earn a credential demonstrating computer support technician competencies. The certificate consists of the core skills that students need for computer and end-user support. In addition, this certificate will provide a way for professionals currently in the industry to update their computer support technician skills and for new students to show progress in the CIT program.

Information Security Specialist Certificate

The Information Security Specialist Certificate offers students the opportunity to earn a credential demonstrating the fundamentals of information security. This certificate consists of the core skills that students need to effectively build and maintain information security systems. In addition, this certificate will provide a way for professionals currently in the industry to update their information security skills and for new students to show progress in the CIT program.

Microsoft Network Administrator Certificate

The Microsoft Network Administrator Certificate offers students the opportunity to earn a credential demonstrating the fundamentals of computer networking. This certificate consists of the core skills that students need to effectively build and maintain computer networks. In addition, this certificate will provide a way for professionals currently in the industry to update their computer networking skills and for new students to show progress in the CIT program.

CISCO Networking Associate Certificate

The CISCO Networking Associate Certificate offers students the opportunity to earn a credential demonstrating the fundamentals of computer networking. This certificate consists of the core skills that students need to effectively build and maintain computer networks. In addition, this certificate will provide a way for professionals currently in the industry to update their computer networking skills and for new students to show progress in the CIT program. The

CISCO Networking Associate Certificate prepares students for the CCNA exam which is recognized by the computer industry around the world.

Network Technologies Specialist Certificate

The Network Technologies Specialist Certificate offers students the opportunity to earn a credential demonstrating network technology competencies. This certificate consists of specialized networking classes that students need to effectively configure and maintain networks using network technologies specialist skills. In addition, this certificate will provide a way for professionals currently in the industry to update their network technologies specialist skills.

Net + Certificate

The Net+ Certificate offers students the opportunity to earn a credential demonstrating the fundamentals of computer networking. This certificate consists of the core skills that students need to effectively build and maintain computer networks. In addition, this certificate will provide a way for professionals currently in the industry to update their computer networking skills and for new students to show progress in the CIT program. The Net+ Certificate prepares students for the CompTia Net+ exam which is recognized by the computer industry around the world.

Security +Certificate

The Security+ Certificate offers students the opportunity to earn a credential demonstrating the fundamentals of information security. This certificate consists of the core skills that students need to effectively build and maintain information security systems. In addition, this certificate will provide a way for professionals currently in the industry to update their computer networking skills and for new students to show progress in the CIT program. The Security+ Certificate prepares students for the CompTia Security+ exam which is recognized by the computer industry around the world.

CISCO Networking Enhanced Certificate

The CISCO Networking Enhanced Certificate offers students the opportunity to earn a credential demonstrating the fundamentals of computer networking. This certificate consists of the core skills that students need to effectively build and maintain computer networks. In addition, this certificate will provide a way for professionals currently in the industry to update their computer networking skills and for new students to show progress in the CIT program. The CISCO Networking Associate Certificate prepares students for the CCNA and Net+ exams which are recognized by the computer industry around the world.

A+ Certificate

The A+ Certificate offers students the opportunity to earn a credential demonstrating basic competency in the area of computer hardware and software. The certificate consists of one course that prepares students for the CompTIA A+ certification exams which are recognized by the computer industry around the world. It gives those who are unable, or do not need, to complete a degree a way of demonstrating their level of proficiency.

Microsoft Enterprise Administrator Certificate

The Microsoft Enterprise Administrator certificate offers students the opportunity to earn a credential demonstrating skills in the administration and design of Microsoft enterprise networks. This certificate consists of the core skills that students need to effectively plan, build, and maintain a Microsoft network. In addition, this certificate will provide a way for professionals currently in the industry to update their Microsoft network administrator skills.

Programming Certificate

The Software Developer Certificate offers students the opportunity to earn a credential demonstrating programming competencies. This certificate consists of the core skills that students need to effectively develop programs using multiple computer languages. In addition, this certificate will provide a way for professionals currently in the industry to update their programming skills and for new students to show progress in the CIT program.

Web Programming Certificate

The Web Programming Certificate offers students the opportunity to earn a credential demonstrating web programming competencies. This certificate consists of the core skills that students need to effectively develop websites using web

programming. In addition, this certificate will provide a way for professionals currently in the industry to update their web programming skills and for new students to show progress in the CIT program.

Web Administration Certificate
The Web Administration Certificate offers students the opportunity to earn a credential demonstrating web administration competencies. This certificate consists of the core skills that students need to effectively maintaining web sites through network and web server administration. In addition, this certificate will provide a way for professionals currently in the industry to update their web administration skills and for new students to show progress in the CIT program.

Social Media Specialist Certificate
The Social Media Specialist Certificate prepares students for careers as social media analysts to leverage social media tools to increase business awareness and presence.

Implementation: Spring 2013

Program Title: Computer & Information Technologies—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.

Program Title: **Computer Technician Certificate**

Upon completion of this program, the graduate can:
1. Use computer terminology correctly.
2. Resolve technical questions using existing documentation.
3. Explore computer hardware and software.
4. Employ basic diagnostic tools to identify and solve hardware and software problems in multiple operating systems.
5. Use network applications effectively.
6. Describe communication protocols for computer networks.
7. Implement basic computer system security measures.

Program Title: **CIT Fundamentals Certificate**

Upon completion of this program, the graduate can:
1. Use computer terminology.
2. Explore computer hardware and software.
3. Employ basic diagnostic tools to identify and solve hardware and software problems in multiple operating systems.
4. Use logic and design methods to understand computational thinking.
5. Explore database fundamentals.
6. Manage and use network applications.
7. Describe communication protocols for computer networks.
8. Implement basic computer system security measures.
9. Use a programming language to design and run basic level programs.

Program Title: **Productivity Software Specialist Certificate**

Upon completion of this program, the graduate can:
1. Describe common categories of productivity software and their uses in a work environment.
2. Use and support word processing software at an intermediate level.
3. Use and support spreadsheet software at an intermediate level.
4. Use and support database software at an intermediate level.
5. Use and support presentation software at an intermediate level.
6. Develop and debug modules and macros for software applications.
7. Describe facets of customer service.
8. Conduct end-user training and develop end-user training materials.
9. Use collaborative software.

Program Title: **Computer Tech Basic Certificate**

Upon completion of this program, the graduate can:
1. Install, use, and maintain systems software and applications software.
2. Analyze and implement simple applications.
3. Resolve technical questions using existing documentation.
4. Write end-user documentation using technical resources.
5. Employ basic diagnostic tools to identify and solve hardware and software problems.
6. Utilize logical, mathematical, and analytical skills to facilitate problem solving.
7. Discuss ethical and legal issues in computing such as privacy, corporate property, copyright, and security of software, hardware, and information.
8. Use and use network applications.

Program Title: **Computer Support Technician Certificate**

Upon completion of this program, the graduate can:

1. Explore computer hardware and software.
2. Employ basic diagnostic tools to identify and solve hardware and software problems in multiple operating systems.
3. Describe common categories of productivity software and their uses in a work environment.
4. Use and support application software at an intermediate level.
5. Develop and debug modules and macros for software applications
6. Explore help-desk skills that provide customer service and support including processes and associated technologies in a technical or non-technical environment.

Program Title: Information Security Specialist Certificate
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: Microsoft Network Administrator Certificate
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: CISCO Networking Associate Certificate
Upon completion of this program, the graduate can:
1. Install, configure, operate, and troubleshoot medium-size Cisco route and switched networks.
2. Explain how the OSI (Open Systems Interconnection) model relates to development and troubleshooting of network communications.
3. Implement TCP/IP (Transmission Control Protocol/Internet Protocol) addressing and subnetting schemes.

Program Title: Network Technologies Specialist Certificate
Upon completion of this program, the graduate can:
1. Describe 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 and implement advanced network security measures.

Program Title: **Net+ Certificate**
Upon completion of this program, the graduate can:
1. Plan and install a home or small business network and connect it to the Internet.
2. Identify and explain the types of transmission media used for communications channels.
3. Verify and troubleshoot network and Internet connectivity.
4. Share resources such as files and printers among multiple computers.
5. Recognize and mitigate security threats to a home network.
6. Configure and verify common Internet applications.
7. Configure basic IP services through a GUI.
8. Explain the OSI 7-layer model.
9. Terminate cable and understand cable specifications.

Program Title: **Security+ Certificate**
Upon completion of this program, the graduate can:
1. Explain basic security concepts.
2. Identify and explain appropriate use of security tools to facilitate security.
3. Evaluate current security issues related to computer and network systems.
4. Evaluate and select appropriate incident response procedures, disaster recovery, and risk identification techniques to ensure business continuity.
5. Differentiate various malware and systems security threats against computers and networks.
6. Explain the vulnerabilities and mitigations associated with computers and network devices.
7. Explain the proper use of common tools for carrying out vulnerability assessments.
8. Identify and describe potential application and data vulnerabilities, including buffer overflow, DLL injection, and SQL injection.
9. Explain how host firewalls, malware protection, and updates are important to application and data security.
10. Describe the importance of user accounts and associated permissions.
11. Compare and discuss logical and physical access control security methods.
12. Explain authentication models and identify components of each model.
13. Summarize and explain general cryptography concepts.
14. Demonstrate public and private key pairs for digital signing and encryption/decryption.

Program Title: CISCO Networking Enhanced Certificate
Upon completion of this program, the graduate can:
1. Install, configure, operate, and troubleshoot medium-size Cisco route and switched networks.
2. Explain how the OSI (Open Systems Interconnection) model relates to development and troubleshooting of network communications.
3. Implement TCP/IP (Transmission Control Protocol/Internet Protocol) addressing and subnetting schemes.

Program Title: A+ Certificate
Upon completion of this program, the graduate can:
1. Identify and explain motherboard components.
2. Identify, install, configure, and upgrade personal computer components.
3. Perform device driver installation, scheduled maintenance, and memory and firmware updates.

4. Identify common tools, basic diagnostic procedures, troubleshooting techniques, and preventive maintenance methods.
5. Explain and apply the troubleshooting process to diagnose and repair common hardware and software problems.
6. Demonstrate an understanding of conversion between binary, decimal, hexadecimal number systems.
7. Compare and contrast client operating systems and their features.
8. Use multiple user interfaces, including command-line, to perform operating system management tasks; to configure, optimize, and upgrade the current client operating systems; and to diagnose network connection issues.
9. Use and manage file systems, operating system utilities, backup programs, and optimization tools.
10. Describe the process to install, configure, secure, and troubleshoot a basic small or home office network.
11. Identify the fundamental principles of networking and security.
12. Describe and apply appropriate operational procedures including safety, environmental procedures, good communication skills, and professional behavior.

Program Title: Microsoft Enterprise Administrator Certificate
Upon completion of this program, the graduate can:
1. Install, configure, and manage Microsoft Windows client operating systems.
2. Use a Microsoft Windows server to create and manage user accounts.
3. Use a Microsoft Windows server to share and secure resources.
4. Use a Microsoft Windows server to establish and maintain Internet connections.
5. Deploy, configure, and manage Microsoft Windows servers such as Web Servers, Terminal Servers, SharePoint Servers, and File Servers.
6. Design an overall IT environment for an enterprise including both mid-range and long-term strategies.
7. Plan a forest restructuring including cross-forest authentication, backward compatibility, object migration, migration planning, implementation planning, and environment preparation.
8. Design and implement public key infrastructure including certificate services, PKI operations and maintenance, and certificate life cycle management.
9. Design enterprise-level network services including network access policies, remote access strategy, perimeter networks, and server and domain isolation.
10. Design core identity and access management components including forest and domain functional levels, intra-organizational authorization and authentication, and schema modifications.

Program Title: Programming Certificate
Upon completion of this program, the graduate can:
1. Demonstrate proficiency in problem solving and critical thinking skills.
2. Demonstrate proficiency in programming.

Program Title: Web Programming Certificate
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. Design and develop programs using primitive data types in a web programming language.
5. Create interactive web pages utilizing client-side and server-side scripting.

Program Title: Web Administration Certificate
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. Install, configure and maintain a web server.
5. Use knowledge of Internet protocols to support and troubleshoot Internet services.

Program Title: **Social Media Specialist Certificate**
Upon completion of this program, the graduate can:
1. Describe the components, definitions, and uses of Social Media.
2. Demonstrate an understanding of the Internet and web page development.
3. Identify appropriate social tools and technologies.
4. Develop skills to leverage social media applications and marketing to increase business presence.
5. Utilize technology to track, collect, and analyze a diverse range of social media metrics and data.

Curriculum:

Course Prefix	Course Number	Program Title: Computer & Information Technologies (AAS) Course Title	Credit Hours
		General Education	
ENG	101	Writing I	3
MAT	126	Technical Algebra and Trigonometry (or higher)	3
		Social/Behavioral Science Course	3
		Heritage/Humanities Course	3
		Natural Sciences Course	3
		Subtotal	**15**
		General Education for Computer Science Track	
ENG	101	Writing I	3
MAT	174	Calculus	4
		Social/Behavioral Science Course	3
		Heritage/Humanities Course	3
PHY	231	General University Physics	4
PHY	241	General University Physics Laboratory	1
		Subtotal	**18**
		Technical Core Requirements	
CIT	105	Introduction to Computers	3
CIT	111	Computer Hardware and Software	4
CIT	120	Computational Thinking	3
CIT	150	Internet Technologies OR	3
CIT	155	Web Page Development OR	(3)
CIT	157	Web Site Design and Production	(3)
CIT	170	Database Design Fundamentals	3
CIT	180	Security Fundamentals	3
		Level I Networking Course	4
		Approved Level I Programming Language Course	3
CIT	291	CIT Capstone	3
		Subtotal	**29**
		Applications Track	
CIT	130	Productivity Software	3
		Approved Business or Management Course	3
		Approved CIT Technical Course	3

		Completion of Applications Track Course Sequences in Business Software Specialist or Computer Support or Geographic Information Systems or Software Support	12
		Track Subtotal	**21**
Business Software Specialist:			
CIT	234	Advanced Productivity Software	3
CIT	236	Adv Data Organization Software	3
CIT	171	SQL I	3
		Approved Business or Management Course	3
		Subtotal	**12**
Computer Support:			
CIT	232	Help Desk Operations	3
CIT	234	Advanced Productivity Software	3
CIT	236	Adv Data Organization Software	3
		CIT Technical Course	3
		Subtotal	**12**
Geographic Information Systems:			
CIT	125	Introduction to GIS	3
CIT	225	GIS Software Tools	3
CIT	229	Selected Topics in GIS	3
CIT	253	Data-Driven Web Pages: Topic	3
		Subtotal	**12**
OR			
GIS	110	Spatial Data Analysis and Map Interpretation	3
GIS	120	Introduction to Geographic Information Systems	3
GIS	210	Advanced Geographic Information Systems	3
CIT	253	Data-Driven Web Pages: Topic	3
		Subtotal	**12**
Software Support:			
CIT	234	Advanced Productivity Software	3
CIT	236	Adv Data Organization Software	3
CIT	253	Data-Driven Web Pages: Topic	3
ENG	102	Writing I OR	3
		Oral Communications	(3)
		Subtotal	**12**

	Computer Science Track		
ENG	102	Writing II	3
MAT	184	Calculus II	3
		Approved Computer Science Sequence (One course in the sequence is taken as part of the core)	9-11
		Track Subtotal	**15-17**
		Total	**62-64**

	Information Security Track		
CIT	182	Perimeter Defense	3
CIT	184	Attacks and Exploits	3
CIT	217	UNIX/Linux Administration	3
		Approved Network Elective Courses	6
		Approved Security Elective Course	3
		Approved Technical Course(s)	6
		Track Subtotal	**24**

	Internet Technologies Track		
CIT	150	Internet Technologies OR	3
CIT	155	Web Page Development	(3)

		(whichever was not taken in core)	
CIT	157	Web Site Design and Production	3
CIT	253	Data-Driven Web Pages: Topic	3
CIT	257	Applied Internet Technologies OR	3
CIT	258	Internet Technologies Seminar	(3)
		Completion of Internet Technologies Specialization Sequences	12
		Track Subtotal	**24**

Web Programming Specialization Sequence:

		Approved Level I Web Programming Language	3
		Approved Level II Web Programming Language	3
CIT	171	SQL I	3
		Approved CIT Technical Course	3
		Subtotal	**12**

Web Administration Specialization Sequence:

CIT	219	Internet Protocols	3
CIT	255	Web Server Administration	3
CIT	261	MS Active Directory Services AND	3
CIT	213	MS Client/Server Config	3
		OR	
CIT	262	MS Network Infrastructure AND	(3)
CIT	213	MS Client/Server Config	(3)
		OR	
CIT	217	UNIX/Linux Administration AND	(3)
CIT	218	UNIX/Linux Net Infrastructure	(3)
		Subtotal	**12**

Network Administration Track

		Network Administration Specialization Sequence	12
		Approved CIT Technical Courses	8-12
		Subtotal	**20-24**

Microsoft Windows Administration Specialization Sequence

CIT	213	MS Client/Server Config	3
CIT	214	Server Infrastructure Admin	3
CIT	261	MS Active Directory Services	3
CIT	264	MS Server Admin	3
		Subtotal	**12**

Cisco Network Associate - Exploration Specialization Sequence

CIT	210	Routing Protocols and Concepts	4
CIT	211	LAN Switching and Wireless	4
CIT	212	Accessing the WAN	4
		Subtotal	**12**

Cisco Network Associate – Discovery Specialization Sequence

CIT	163	Small-Medium Office or ISP	4
CIT	164	Intro to Routing and Switching	4
CIT	165	Network Design and Support	4
		Subtotal	**12**

Network Technologies Track

CIT	219	Internet Protocols	3
CIT	288	Network Security	3
		Approved Level I and Level II Network Technology Microsoft Windows Course Sequence OR	12
		Approved Level I and Level II Network Technology Cisco Course Sequence OR	(12)

		Approved Level I and Level II Network Technology UNIX/Linux Course Sequence	(12)
		Approved Level I, Level II, or Level III Network Technologies Specialization Sequence	4-6
		Track Subtotal	**22-24**

Programming Track

CIT	130	Productivity Software	3
		Approved CIT Technical Courses	6
		Completion of Programming Track Specialization Sequence Development	15
		Subtotal	**24**

Programming Information Systems Specialization Sequence

CIT	171	SQL I	3
		Approved Level II Programming Language	3
		Approved Level I, II, Or III Programming Language	3
		Approved Programming Management Course	3
		Approved Programming Business Course	3
		Subtotal	**15**

Programming Software Development Specialization Sequence

		Approved Level I Programming Language	3
		Approved Level II Programming Language	3
		Approved Level II Programming Language	3
		Approved Level I, II, Or III Programming Language	3
CIT	253	Data-Driven Web Pages: Topic	3
		Subtotal	**15**
		Total	**65-68**

Course Choice Lists

Approved Business Courses*

ACT	101	Fundamentals of Accounting	3
ACC	201	Financial Accounting I	3
BAS	160	Introduction to Business	3
		Any business course approved by Program Coordinator	3

Approved Management Courses*

BAS	200	Small Business Management	3
BAS	274	Human Resource Management	3
BAS	283	Principles of Management	3
BAS	287	Supervisory Management	3
BAS	288	Personal and Organizational Leadership	3
MGF	256	Production Management	3
OST	275	Office Management	3
QMS	101	Introduction to Quality Systems	3
QMS	201	Customer Service Improvement Skills	3
		Any management course approved by Program Coordinator	3

Approved Level I Networking Course*

CIT	160	Intro to Networking Concepts	4
CIT	161	Network Fundamentals	4
CIT	162	Home and Small Office Fundamentals	4

Approved Network Elective Course*

CIT	163	Small-Medium Business or ISP	4
CIT	164	Intro to Routing and Switching	4
CIT	165	Network Design and Support	4
CIT	210	Routing Protocols and Concepts	4
CIT	211	LAN Switching and Wireless	4
CIT	212	Accessing the WAN	4
CIT	213	MS Client/Server Config	3
CIT	214	Server Infrastructure Admin	3
CIT	217	UNIX/Linux Administration	3
CIT	218	UNIX/Linux Net Infrastructure	3
CIT	219	Internet Protocols	3
CIT	260	Network Hardware Installation and Troubleshooting	3
CIT	261	MS Active Directory Services	3
CIT	262	MS Network Infrastructure	3
CIT	264	MS Server Administration	3
CIT	265	MS Applications Servers	3
CIT	266	MS Enterprise Administration	3

Approved Security Elective Course*

CIT	284	Computer Forensics	3
CIT	285	Windows OS Security	3
CIT	286	UNIX/Linux OS Security	3
CIT	287	Cisco OS Security	3
CIT	288	Network Security	3

Approved Level I Network Technologies Course Sequences*

Microsoft Windows Course Sequence I

		Any 6 credit hours of course work from the Microsoft Windows Network Specialization Course list	6

UNIX/Linux Course Sequence

CIT	217	UNIX/Linux Administration AND	3
CIT	218	UNIX/Linux Net Infrastructure	3

Cisco Course Sequence I

CIT	210	Routing Protocols and Concepts	4

Security Course Sequence I
Any 6 credit hours of course work from the Security Specialized
Sequence Course list which is not taken as part of another sequence.

Approved Level II Network Technology Specialization Sequences*

Microsoft Windows Course Sequence II

		Any 6 credit hours of course work from the Microsoft Windows Network Specialization Course list (after completing the requirements for the Microsoft Windows Specialization Sequence I)	6

UNIX/Linux Course Sequence II
Choose two:

CIT	286	UNIX/Linux OS Security	3
CIT	255	Web Server Administration	3
CIT	145	Perl I	3

Cisco Course Sequence II

CIT	211	LAN Switching and Wireless AND	4
CIT	212	Accessing the WAN	4

Approved Level III Network Technology Specialization Sequences*

Internet <u>Servers Administration Course Sequence</u>

CIT	255	Web Server Administration AND	3
CIT	265	MS Applications Servers	3

<u>Microsoft Windows Course Sequence III</u>

		Any 6 credit hours of course work from the Microsoft Windows Network Course list (after completing the requirements for the Microsoft Windows Sequence II)	6

Approved Microsoft Windows Network Courses*

CIT	213	MS Client/Server Config	3
CIT	261	MS Active Directory Services	3
CIT	262	MS Network Infrastructure	3
CIT	264	MS Server Administration	3
CIT	265	MS Applications Servers	3
CIT	266	MS Enterprise Administration	3

Approved Security Sequence Courses*

CIT	182	Perimeter Defense and Countermeasures	3
CIT	184	Attacks and Exploits	3
CIT	284	Computer Forensics	3
CIT	285	Windows OS Security	3
CIT	286	UNIX/Linux OS Security	3

Approved Level I Programming Language Courses*

CIT	140	JavaScript I	3
CIT	141	PHP I	3
CIT	142	C++ I	3
CIT	145	Perl I	3
CIT	147	Programming I: Language	3
CIT	148	Visual Basic I	3
CIT	149	Java I	3
CIT	171	SQL I	3
		University Level I programming Languages as approved by local Program Coordinator	3-4

Approved Level II Programming Language Courses*

CIT	241	PHP II	3
CIT	242	C++ II	3
CIT	246	2D Game Development: Language	3
CIT	247	Programming II: Language	3
CIT	248	Visual Basic II	3
CIT	249	Java II	3
CIT	271	SQL II	3
		University Level II programming Languages as approved by local Program Coordinator	3-4

Approved Level III Programming Language Courses*

CIT	276	3D Game Development: Language	3
CIT	277	Programming III: Language	3
CIT	278	Visual Basic III	3
		University Level III programming Languages as	3-4

Approved Level I Web Programming Language Courses*

CIT	141	PHP I	3
CIT	148	Visual Basic I	3
CIT	149	Java I	3

Approved Level II Web Programming Language Courses*

CIT	241	PHP II	3
CIT	248	Visual Basic II	3
CIT	249	Java II	3

Approved Social Media Courses*

CIT	151	Social Media I	3
CIT	152	Social Media Tools and Technologies	3
CIT	251	Social Media II	3

Approved Computer Science Sequences:

Offerings vary per college.

Approved CIT Technical Courses*

Additional CIT Course(s) EXCEPT CIT 103		1-3

*Or other courses approved by Computer & Information Technologies Program Coordinator
Note:
Students may not use one course to fulfill multiple requirements.
Students may choose CIT 290 or COE 199 for a maximum of 3 credit hours.

Approved University Computer Science Sequences:

University of Kentucky

CS	215	Introduction to Program Design, Abstraction, and Problem Solving and	4
CS	216	Introduction to Software Engineering and	3
CS	275	Discrete Mathematics	4

CERTIFICATES

Program Title: Computer Technician Certificate

Course Prefix	Course Number	Course Title	Credit Hours
CIT	105	Introduction to Computers	3
CIT	111	Computer Hardware and Software	4
CIT	160	Intro to Networking Concepts OR	4
CIT	161	Network Fundamentals OR	(4)
CIT	162	Home and Small Office Networks	(4)
CIT	180	Security Fundamentals	3
		Total	**14**

Program Title: CIT Fundamentals Certificate

Course Prefix	Course Number	Course Title	Credit Hours
CIT	105	Introduction to Computers	3
CIT	111	Computer Hardware and Software	4

Course Prefix	Course Number	Course Title	Credit Hours
CIT	120	Computational Thinking	3
CIT	150	Internet Technologies	3
CIT	170	Database Design Fundamentals	3
CIT	180	Security Fundamentals	3
CIT	160	Intro to Networking Concepts OR	4
CIT	161	Network Fundamentals OR	(4)
CIT	162	Home and Small Office Networks	(4)
		Approved Level I Programming Language	3
		Total	**26**

Program Title: Productivity Software Specialist Certificate

Course Prefix	Course Number	Course Title	Credit Hours
CIT	105	Introduction to Computers	3
CIT	130	Productivity Software	3
CIT	234	Advanced Productivity Software	3
CIT	236	Adv Data Organization Software	3
		Total	**12**

Program Title: Computer Tech Basic

Course Prefix	Course Number	Course Title	Credit Hours
CIT	105	Introduction to Computing	3
CIT	111	Hardware and Software Systems Concepts	4
		Level I Network Course	4
		TOTAL	**11**

Program Title: Computer Support Technician

Course Prefix	Course Number	Course Title	Credit Hours
CIT	130	Productivity Software	3
CIT	111	Hardware and Software Systems Concepts	4
CIT	232	Help Desk Operations	3
CIT	234	Advanced Productivity Software	3
CIT	236	Adv Data Organization Software	3
		TOTAL	**16**

Program Title: Information Security Specialist

Course Prefix	Course Number	Course Title	Credit Hours
		Level I Network Course	4
CIT	180	Security Fundamentals	3
CIT	182	Perimeter Defense	3
CIT	184	Attacks and Exploits	3
		Approved Security/Network Elective Courses	6
		Total	**19**

Program Title: Microsoft Network Administrator

Course Prefix	Course Number	Course Title	Credit Hours
		Level I Network Course	4
CIT	213	MS Client/Server Config	3
CIT	214	Server Infrastructure Admin OR	3

Course Prefix	Course Number	Course Title	Credit Hours
CIT	262	MS Network Infrastructure	(3)
CIT	261	MS Active Directory Services	3
CIT	264	MS Server Admin	3
		Approved CIT Technical Course	3
		Total	**19**

Program Title: CISCO Networking Associate

Course Prefix	Course Number	Course Title	Credit Hours
CIT	161	Network Fundamentals OR	4
CIT	162	Home and Small Office Networks	(4)
		Network Associate Track Course Sequence	12
		Total	**16**

Program Title: Network Technologies Specialist

Course Prefix	Course Number	Course Title	Credit Hours
CIT	219	Internet Protocols	3
CIT	288	Network Security	3
		Approved Level I and Level II Network Technology Microsoft Windows Course Sequence OR	12
		Approved Level I and Level II Network Technology Cisco Course Sequence OR	(12)
		Approved Level I and Level II Network Technology UNIX/Linux Course Sequence	(12)
		Approved Level I, Level II, or Level III Network Technologies Course Sequence	4-6
		Total	**22-24**

Program Title: CISCO Networking Enhanced

Course Prefix	Course Number	Course Title	Credit Hours
CIT	161	Network Fundamentals OR	4
CIT	162	Home and Small Office Networks	(4)
		Network Associate Track Course Sequence	12
		Approved CIT Technical Courses	8-9
		Total	**24-25**

Program Title: A+

Course Prefix	Course Number	Course Title	Credit Hours
CIT	111	Hardware and Software Systems Concepts	4
		Total	**4**

Program Title: Net+

Course Prefix	Course Number	Course Title	Credit Hours
CIT	160	Intro to Networking Concepts	3
		Total	**3**

Program Title: Security+

Course Prefix	Course Number	Course Title	Credit Hours

Course Prefix	Course Number	Course Title	Credit Hours
CIT	180	Security Fundamentals	3
		Total	**3**

Program Title: Microsoft Enterprise Administrator

Course Prefix	Course Number	Course Title	Credit Hours
		Level I Network Course	4
CIT	213	MS Client/Server Config	3
CIT	214	Server Infrastructure Admin OR	3
CIT	262	MS Network Infrastructure	(3)
CIT	261	MS Active Directory Services	3
CIT	265	MS Applications Server	3
CIT	266	MS Enterprise Admin.	3
		Approved CIT Technical Course	3
		Total	**22**

Program Title: Programming

Course Prefix	Course Number	Course Title	Credit Hours
CIT	120	Computational Thinking	3
		Approved Level I Programming Language	3
		Approved Level II Programming Language	3
		Approved Level I, II or III Programming Language	3
		Total	**12**

Program Title: Web Programming

Course Prefix	Course Number	Course Title	Credit Hours
CIT	120	Computational Thinking	3
CIT	150	Internet Technologies	3
CIT	155	Web Page Development	3
CIT	157	Web Site Design and Production	3
CIT	171	SQL I	3
CIT	253	Data-Drive Web Pages: Topic	3
		Approved Level I Web Programming Language	3
		Approved Level II Web Programming Language	3
		Total	**24**

Program Title: Web Administration

Course Prefix	Course Number	Course Title	Credit Hours
CIT	120	Computational Thinking	3
CIT	150	Internet Technologies	3
CIT	155	Web Page Development	3
CIT	157	Web Site Design and Production	3
CIT	253	Data-Drive Web Pages: Topic	3
CIT	219	Internet Protocols	3
CIT	255	Web Server Administration	3
CIT	261	MS Active Directory Services AND	3
CIT	213	MS Clinet/Server Config	3
		OR	
CIT	262	MS Network Infrastructure AND	(3)
CIT	213	MS Client/Server Config	(3)
		OR	

Course Prefix	Course Number	Course Title	Credit Hours
CIT	217	UNIX/Linux Administration AND	(3)
CIT	218	UNIX/Linux Net Infrastructure	(3)
		Total	**27**

Program Title: Social Media Specialist

Course Prefix	Course Number	Course Title	Credit Hours
CIT	105	Introduction to Computers/Digital Literacy	0-3
CIT	155	Webpage Development	3
CIT	151	Social Media I	3
CIT	152	Social Media Tools and Technologies	3
CIT	251	Social Media II	3
BAS	160	Introduction to Business	3
BAS	282	Introduction to Marketing	3
		TOTAL	**18-21**

Dates of Actions:

Revisions: December 2008, October 2010, August 2011, December 2011, April 2012, April 2014