

CS: Information Technology

Course Abbreviation	Program Student Learning Outcomes <i>Course Level Learning Competencies</i> 	Use pattern recognition and logic to predict, analyze and solve problems.	Work autonomously and/or in teams to effectively solve information technology concerns.	Demonstrate knowledge of cyber security threats and concepts of information security	Communicate through verbal and written methods, using clear, accurate and concise language.
	CIS112	Create and use a range formulas and functions from basic to advanced including database functions	I	I	
Use NestedIF functions		I			
Use/Create Financial Functions and Data Tables such as pivot table and break even analysis		I			
Perform what-if analysis using goal seeks and data tables		I			
Create and use data validations and lookup functions		I			
Create Excel templates that locks and protects the worksheet		I			
Develop and edit macros to automate a process		I	I		
Create a spreadsheet with appropriate labels for associated data		I			
Import and export various file formats into and from Excel			I		I
CIS113		Create databases to organize and analyze business or personal records	I,R	I	
	Design the structure and properties of tables, queries, reports, and forms	I,R	I		
	Import/export data into/from a Database	I,R			
	Create relationships between tables, while enforcing referential integrity, and setting join types	I,R	I		
	Create Queries in Access and in SQL to sort, omit duplicates and join tables	I,R	I		
	Plan, design, and create custom forms and sub forms containing calculated controls	I,R	I		
	Use the database splitter, encrypt and decrypt databases	I	I	I	
CIS114	Utilize soft skills with all modes of customer correspondence	I,R	I,R	I	I,R
	Achieve high customer satisfaction	I,R	I,R	I	I,R
	Develop strong listening and communication skills	I,R	I,R	I	I,R
	Recognize and use utilize winning telephone skills	I,R	I,R	I	I,R
	Develop technical writing skills for the Help Desk	I,R	I,R	I	I,R
	Manage difficult customer situations	I,R	I,R	I	I,R
	Solve and prevent incidents and problems	I,R	I,R	I	I,R
	Understand and implement business skills for technical professionals	I,R	I,R	I	I,R
	Actively participate in a team setting with other team players in a service desk setting	I,R	I,R		I,R
	Minimize stress and avoid burnout	I,R	I,R		I,R
CIS115	Explain and Identify top threats to a computer network such as DDOS, password crackers, Spyware and Malware, and how to prevent them.	I	I	I	I
	Explain how to avoid online fraud and identity theft		I	I	I
	Compare and contrast perimeter and layered approaches to network security using best practices		I	I	I
	Explain and demonstrate how to guard against malware, including viruses, worms and trojan horses and how they propagate, and understand how virus scanners operate.	I		I	I
	Describe related legal aspects to computer crimes, including cyber stalking			I	I

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	Describe key terms such as assurance, authenticity, cracker and firewall			I	I
	Explain the basics of modern cryptographic concepts and methods; encryption, digital signatures and certificates	I		I	I
	Describe the basics of privacy, including the function of VPNs, browser settings and anonymity			I	I
	Describe how to implement usable security such as passwords, authentication and physical security	I	I	I	I
	Describe how to protect yourself against social engineering threats			I	I
CIS117	Use the command line to gather information about the network and running processes	I	I		
	Open, edit, and save files using VI and/or Emacs	I	I		
	Combine tools and features such as filters, pipes, appends and redirections to solve problems	I	I		
	Read, write and debug bash scripts which include variables, control structures and system commands	I	I		
	Utilize resources, online and off, to find additional information about the commands and system	I	I		
CIS140	Write algorithms to solve specific problems	I	I		
	Define the concept of abstraction, detail how it relates to computer science, and identify an example	I	I		
	Write programs to solve specific problems using variables	I	I		
	Convert from to and from various number systems and data representations	I	I		
	Summarize the history of computation and the evolution of computer hardware and software	I	I		
	Discuss the impact of computer science on our society and how it impacts our lives and culture	I	I		I
	Explain introductory concepts in a variety of areas in computer science including (but not limited to) Computer Architecture, Computer Security, and Data/Information Systems	I	I	I	I
CIS153	Be able to read, write and test Python scripts at a shell prompt	R	R		I
	Use Python types and expressions	R	R		
	Use Python statements (such as conditionals)	R	R		
	Write and call Python functions	R	R		I
	Write simple Python classes and access methods	R	R		I
	Use and understand a package manager		R		
	Use Python 2 and Python 3 for some simple scripting		R		
	Understand what a unit test is, how to write them and why they are useful	R	R		
	Use a version control system (such as github)	R	R		I
CIS245	Utilize virtualization and container technology such as Docker	R	R		
	Knowledge of virtualization, and virtualization best practices	R	R		
	Experience with storage and backup systems	R	R	R	
	Knowledge of app stacks, such as LAMP	R	R		
	Create and maintain users and passwords	R	R	R	
	Using different Linux operating systems including booting into different run levels, starting and stopping processes and controlling services	R	R		
	Deploy, configure and maintain a system	R	R	R	R
	Do software installations, updates and maintenance	R	R	R	
	Manage basic security including firewalls and system hardening	R	R	R	R
	Read, utilize and produce technical documentation	R	R		R
	State the principles of how computers work including typical computer architecture using standard terminology				I
	Write algorithms to solve specific problems.	I	I		I
	Demonstrate basic Operating system usage for Windows and Linux (command based) including basic file and folder management	I	I		I
	Demonstrate safe computer usage including basic PC security and information assurance	I	I	I	I
	Describe what happens when you email, use a web browser or IM		I		I

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CTN110	Describe the differences among network types and the typical network equipment	I	I		I
	Explain the basic use of office application software and use it for basic problem solving in an Information Technology context.		I		I
	Demonstrate the implementation of an algorithm using a programming system (basic)	I	I		
	Demonstrate the basic process of Help Desk calls.		I		I
	Describe the importance of ethics in Information Technology using specific examples		I		I
	Demonstrate an understanding of web terminology including protocols, ports and IP addresses		I	I	I
	Demonstrate a proficiency with virtualization	I	I		
CTN201	Demonstrate the differences among Cable types		I		
	Construct and test cables using standard connectors and techniques		I		
	Plan a network layout	I	I		I
	Use cable management hardware		I		
	Use diagnostic procedures to locate network problems	I	I		
	Understand layered protocols	I	I	I	
	Detect and interpret network packets	I	I	I	
	Describe the use of hubs and switches		I		I
	Troubleshoot routing issues	I	I		
	Use a firewall		I	I	
	Diagnose DNS problems	I	I		
	Monitor and troubleshoot local networks	I	I	I	
Create and manage a local network	I	I	I		

Electives

CIS154	Write algorithms and programs, in the procedural paradigm, to solve specific problems using variables, console and file IO, loops, decision structures, functions, arrays, and pointers.	I	I		
	Debug and correct programs	I	I		
	Write functions that utilize the differences between pass-by-reference and pass-by-value	I	I		
	Explain the concept of a pointer (reference) and describe how it relates to memory allocation	I	I		
	Draw and explain a model of system memory throughout program execution	I	I		
CIS160	structures, methods, arrays, classes, and objects	I	I		
	Design and implement programs with multiple classes that includes the use of encapsulation, inheritance (by extension and by interface), and polymorphism to solve a problem	I	I		
	Write a program that declares, initializes, accesses, and mutates arrays to solve a problem	R	I,R		
	Design and implement a program creates a GUI	I	I,R		
	Debug and correct programs	R	I,R		
	Explain the concept of a reference variable and describe how it relates to memory allocation	R	I,R		
CIS215	Represent a model of system memory throughout program execution	R	I,R		
	Demonstrate knowledge of a core set of security tools	R	R	R	R
	Use existing monitoring tools for intrusion detection	R	R	R	R
	Demonstrate proper use of cryptographic systems to secure information in storage and transit			R	R
	Demonstrate knowledge of tools analyzing intrusions	R	R	R	R
	Demonstrate knowledge of system hardening processes and policies	R	R	R	R
	Produce appropriate policies for a variety of security issues		R	R	R
	Demonstrate knowledge of data access and control systems	R	R	R	R
	Perform the basic steps of a security audit and vulnerability analysis	R	R	R	R
	Demonstrate the ability to use appropriate tools to recover from an intrusion		R	R	R
	Demonstrate the use of basic tools for cleaning systems		R	R	R
CIS210	Plan disaster recovery policies and procedures	R	R	R	R
	Choose appropriate data models for projects	R	R		
	Implement data design in a relational database	R	R		R
	Use query language (SQL) to create, access, update and delete.	R	R		
	Program a complex project using industry standard techniques.	R	R		R
	Describe the issues related to database performance	R	R		E
CIS220	Show the advantages and disadvantages of various database types	R	R		
	Use alternate database types	R	R		
	Describe the role of computer forensics in a criminal investigation.		R		E
	Demonstrate the ability to perform a basic computer forensic analysis using computer and network-based tools.		R		
	Locate and recover available digital information from digital systems using standard tools			R	R
CIS220	Articulate how the laws and regulations apply to the appropriation of computers and digital systems for forensic analysis, citing what laws			R	E
	Describe the underlying concepts of how data is stored on computers and the general structure of the Internet.		R		R

	Apply current industry best-practices to the analysis of some hypothetical and real case scenarios	R	R	R	E
	Explain the processes involved in cryptography and steganography as it applies to forensic investigations			R	
	Use method authentication systems to verify files		R	R	
CIS225	Detail the organization and architecture of embedded systems	I	I,R		
	Write a program to transfer data between multiple support devices	I	I,R		
	Write a program that utilizes the instruction set of the embedded controller including macros, jumps/branches, stacks, and subroutines	I, R	I,R		
	Write programs that utilize the differences between direct and indirect address	R	I,R		
	Write programs that utilize logical operations, bit manipulation, and arithmetic operations.	I	I,R		
	Perform conversions from one number base to another	R	I,R		
	Write a program that switches, LEDs, keyboards, LCDs	I	I,R		
CTN222	Install, configure and manage Microsoft Servers		R		
	Analyze and explain the use of Active Directory	R	R		R
	Compare and contrast the different types of user and group management		R	R	R
	Evaluate and classify various network security and backup strategies	R	R	R	
	Detail Security strategies and tactics	R	R	R	R
	Install, configure and manage SharePoint (collaboration server)		R		
	Install, configure and manage Exchange (eMail server)		R		
CTN 223	Manage and troubleshoot a Router		E	E	
	Configure a router including enhanced editing and security		E	E	
	Manage and troubleshoot a switch	E	E	E	
	Understand and be able to implement dual stack IP addressing	E	E		
	Configure HyperTerminal for router and switch access	E	E		
	Use Cisco for security device manager and discovery protocol	E	E		
	Design and implement a VLAN	E	E	R	
	Design and implement an enterprise WAN	E	E	R	
	Differentiate between Exterior and Interior Gateway Protocols	E	E		E
	Configure and maintain a VPN	E	E	R	
	Configure and troubleshoot a hybrid Network	E	E	R	