# CIT COURSE STUDENT LEARNING OUTCOMES

## CIT 107 - Databases

Students will be able to design and create a simple database to satisfy pre-defined requirements.

Students will be able to join tables, sort data and create queries and reports.

## CIT 112 - Network +

Students will be able to correctly cable a LAN and troubleshoot cabling problems.

Students will be able to design, implement, test and troubleshoot an IP addressing plan for a small network.

Students will be able to explain the purpose and function of common network protocols.

## CIT 114 - IT Essentials

CSLOs are under review.

## CIT 128 - Introduction to Software Development

Students will be able to describe the basic processes that a computer uses to execute software.

Students will be able to design a software system (prior to coding).

Students will be able to implement a structured solution (program or algorithm) to a small software specification.

## CIT 130 - Beginning Java

Students will be able to apply basic object-oriented programming skills.

Students will be able to analyze software code and predict the output.

Students will be able to apply principles of algorithm design.

## CIT 134 - Beginning C# Programming

Students will be able to apply essential object oriented programming skills.

Students will be able to analyze software code and predict the output.

Students will be able to apply principles of algorithm design.

## CIT 135 - Introduction to Swift Coding

Students will be able to explain the fundamentals of Swift, building modern mobile apps, iOS, Xcode, and other tools in the Xcode development environment.

Students will be able to explain the type system of the Swift library.

Students will be able to identify strings, functions, structures, collections, and loops.

Students will be able to incorporate variables, conditionals, loops, arrays, objects, and functions to build apps.

Students will be able to apply error handling and techniques.

Students will be able to identify well-written code from poorly written code.

Students will be able to apply Interface Builder and storyboards to build the user interface for apps with multiple views.

## CIT 136 - Application Development with Swift

Students will be able to explain why UIKit is a critical part of app development.

Students will be able to design an app using views and controls in UIKit.

Students will be able to incorporate design controls and responses to events.

Students will be able to build an app using ARKit, (augmented reality).

Students will be able to construct customized user interfaces.

Students will be able to apply Xcode's project navigator, debug area, assistant editor, and version editor.

Students will be able to define and explain the importance of abstraction and simple enumerations.

Students will be able to differentiate between a structure and a class.

## CIT 148 - Beginning Python Programming

Students will be able to solve programming problems using the fundamental syntax and semantics of Python.

Students will be able to create programs that include appropriate looping, decision, and data structures.

Students will be able to implement and use functions effectively in Python programs.

## CIT 151 - Beginning Web Development

Students will be able to organize the content of a website and publish Web pages.

Students will be able to create well-designed, accessible web pages that validate and conform to web standards.

Students will be able to enhance web pages with interactive features.

## CIT 152 - Web Script Language Programming

Students will be able to create Web pages that use the Window Object of the Browser Object Model appropriately to provide dynamic Web content.

Students will be able to use functions, events, and control structures in JavaScript when processing Web form information.

Students will be able to save state information with JavaScript.

## CIT 173 - Introduction to Linux

Students will be able to show proficiency with basic Linux shell commands.

Students will be able to show proficiency with the Linux Operating System by using the graphical user interface and the command line.

## CIT 174 - Linux System Administration

Students will be able to show proficiency with user security and user access terms and procedures.

Students will be able to demonstrate an understanding of processes and services on a Linux system.

## CIT 176 - Linux Shell Programming

Students will be able to demonstrate proficiency in using Linux tools.

Students will be able to demonstrate proficiency in integrating all key language features: arrays, functions, pattern matching, loops, and variables.

Students will be able to show proficiency in developing interactive scripts.

## CIT 180 - Database Concepts and SQL

CSLOs are under review.

## CIT 198 - Special Topics in CIT

CSLOs are under review.

## CIT 201 - Word Certification Preparation

Students will be able to show proficiency with Microsoft Word by creating tables of content and bibliographies, performing mail merges and securing documents.

Students will be able to show proficiency with Microsoft Word by editing documents and customizing Word, creating templates, tables, and lists.

Students will be able to use the features of Microsoft Word to add pictures and shapes to documents, work with captions and add navigation tools to documents.

## CIT 202 - Excel Certification Preparation

Students will be able to show proficiency with Microsoft Excel by creating and editing workbooks and formatting and managing worksheets.

Students will be able to show proficiency with Microsoft Excel by creating charts, adding pictures and shapes and securing documents.

Students will be able to use the features of Microsoft Excel by working with data and creating and editing basic and advanced formulas.

## CIT 211 - MCITP/MCTS Windows Workstation OS

CSLOs are under review.

## CIT 212 - MCITP/MCTS Windows Server OS

CSLOs are under review.

## CIT 213 - MCITP/MCTS Network Infrastructure

CSLOs are under review.

## CIT 214 - MCITP Application Infrastructure

CSLOs are under review.

## CIT 215 - MCITP Active Directory

CSLOs are under review.

## CIT 216 - Server+

Students will be able to identify environmental issues; understand and comply with disaster recovery, physical and software security procedures and be familiar with industry terminology, server concepts as well as understand server roles, specializations and interaction within the overall computing environment.

Students will be able to describe the support needed to implement a server in the enterprise network role along with the various hardware requirements needed to install and maintain the server.

Students will be able to distinguish between the different types of Hardware components, memory requirements as well as features and types of processers required in a server.

Students will be able to identify the capabilities and roles of the four different Microsoft server 2012 editions and roles they will play in a business environment.

## CIT 217 - Security +

Students will be able to differentiate among various systems security threats and implement appropriate practices and procedures to mitigate those threats.

Students will be able to explain general cryptography and hashing concepts.

Students will be able to identify and apply industry best practices for access control methods.

## CIT 222 - Network Security Fundamentals

Students will be able to design, implement, test, and troubleshoot Virtual Private Networks (VPN).

Students will be able to apply device hardening and secure management practices.

Students will be able to deploy and manage a firewall system for a small business network.

## CIT 230 - Advanced Java

Students will be able to choose a subset of the Swing class components and design and implement a user interface.

Students will be able to create a project that involves design and implementation of a problem solution using class design concepts of inheritance, interfaces, abstract classes and exception handling.

Students will be able to, given a problem specification, design and implement a solution using collection classes.

## CIT 234 - Advanced C# Programming

Students will be able to design and implement program problem solutions involving generic methods.

Students will be able to design and implement program problem solutions involving sequential access file processing.

Students will be able to design and implement program problem solutions using dynamic data structures.

## CIT 235 - Fluent Entity Framework in C#

Students will be able to design a program problem solutions using the Entity Framework.

Students will be able to implement a program problem solution using the "code first" method.

Students will be able to implement a program problem solution using the "data first" method.

## CIT 236 - Common Programming Patterns

Students will be able to identify and analyze common solutions to common programming problems.

Students will be able to solve programming problems by applying programming patterns.

## CIT 237 - Test-Driven Development

Students will be able to explain test-driven development and discuss the differences and nuances of frameworks.

Students will be able to design unit tests for an existing software program.

Students will be able to design unit tests before software programming begins.

## CIT 248 - Advanced Python Programming

Students will be able to create an object-oriented program using Python.

Students will be able to create a program that use modules and packages.

Students will be able to implement programs that interact with relational database management systems.

Students will be able to apply testing and debugging strategies throughout the program development process.

## CIT 251 - Advanced Web Development

Students will be able to create scripts to retrieve and use data from a web form.

Students will be able to use PHP scripting to securely store information retrieved from a Web page into a database.

Students will be able to use programming constructs such as conditional statements and repetition structures in server-side scripts.

## CIT 257 - Web Languages

Students will be able to design a mobile application using the elements of logical structure.

Students will be able to implement basic database manipulation functions for internal and external storage of information via requests passed from a mobile application interface.

Students will be able to incorporate various mobile device capabilities into an event-driven mobile application.

## CIT 263 - Project Management

Students will be able to demonstrate the ability to write a business plan that contains standard elements, including an executive summary and an organizational overview.

Students will be able to demonstrate the ability to develop a project plan and schedule using project management software.

Students will be able to demonstrate the ability to communicate and work effectively with members of a team and members of external groups.

## CIT 271 - Cyber Threat Intelligence

Students will be able to describe the intelligence lifecycle and CTI mission roles, as taught by EC-Council CTIA and JP-2.0 principles.

Students will be able to explain how cyberspace operations (planning, execution, assessment) integrate CTI products per JP-3-12.

Students will be able to collect and validate technical and OSINT sources for CTI, applying ICD-206 sourcing rules (accuracy, provenance, and appropriate attribution).

Students will be able to apply ICD-203 analytic standards (objectivity, evidence-based judgments, clear caveats) to produce rigorous analytic assessments.

Students will be able to translate analytic findings into actionable intelligence products for SOCs, incident response, and operational planners while observing classification, handling, and sharing constraints.

Students will be able to conduct basic threat hunting and use structured analytic techniques (e.g., ACH, SACH, link analysis, MITRE ATT&CK mapping) to attribute and profile threat actors.

## CIT 274 - Ethical Hacking

Students will be able to demonstrate the detecting of network/computer penetration from the use of social engineering and illustrate the use of

physical security measures. This will be accomplished by the use of scenario-based objective in a virtual environment.

Students will be able to apply the proper procedures of protecting a private network from hacking, malware, hijacking and Denial of Service attacks.

Students will be able to formulate proper security procedures that will discover and analyze vulnerabilities such as Malware, social engineering and network sniffing.

## CIT 280 - Introduction to Blockchain Concepts

Students will be able to explain the role of common data structures as they apply to blockchain and how they work.

Students will be able to describe how hashing functions work and the role they play in a blockchain system.

Students will be able to describe the various components that make a blockchain and how they work together to form a system.

Students will be able to describe the core pillars of blockchain: distributed, immutable, and consensus.

## CIT 281 - Intermediate Blockchain Concepts

Students will be able to describe how Blockchain addresses access, privacy, and integrity.

Students will be able to describe types of Blockchains and any conflicts.

Students will be able to explain current limitations and future opportunities of Blockchain and types of Blockchain projects.

## CIT 290 - Internship in CIT I

CSLOs are under review.

## CIT 291 - Internship in CIT II

CSLOs are under review.

## CIT 298 - Advanced Special Topics in CIT

Students will be able to demonstrate knowledge or abilities defined by the outcomes in the specific course syllabus used for each section.

## CIT 299 - Independent Study in CIT

Students will be able to apply existing knowledge to new practical skills within the substantive area of computer information technology being taught.

Students will be able to demonstrate knowledge of the specific substantive area of computer information technology being studied.