

# Computer & Information Science

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## **CI104 Introduction to Cybersecurity**

**Cr-3**

This course provides students with a broad understanding of the concepts and interdisciplinary applications of cybersecurity and its impact on society. It examines the historical development of security in technology as it relates to governance, personal information and assets, and major commerce sectors such as finance, healthcare, retail, and manufacturing. It also introduces basic networking, assessing and handling of security risks, hardware components, and basic computer troubleshooting.

## **CI110 Principles of Programming**

**Cr-3**

This course introduces computer programming methods and techniques of problem-solving using structured programming. Students analyze problems and organize effective solutions. Techniques of problem-solving include defining the problem, specifying required input and output, developing the algorithm, and testing the solution. Students also translate the algorithms to a high-level programming language.

## **CI112 Networking Fundamentals**

**Cr-3**

This course introduces the basics of computer networking from concepts and terminology to materials and equipment. Topics form the foundation for further networking courses, with a solid grasp of fundamentals that lead to experience with equipment. The majority of this course deals with theory, with equipment used for demonstration. Prerequisite: IS101 Computers and Society, or IS100 Introduction to Computers and Society, or CI104 Introduction to Cybersecurity or CI121 Microcomputer Techniques for Science.

## **CI121 Microcomputer Techniques for Science**

**Cr-3**

This course provides hands-on training and experience involving scientific word processing, computer-based data analysis, graphical analysis techniques, interfacing hardware and software, data management concepts, scientific simulation methods, imaging technology, and presentation software. It uses a variety of hardware and software currently in the scientific community. Prerequisite: One year of college preparatory mathematics.

## **CI124 Windows Systems Security I**

**Cr-3**

This course provides an understanding of Microsoft Windows 2000/XP Professional, or its current version. It focuses on configuring, optimizing, and securing this software. It introduces principles of server and client hardware selection, server installation and configuration, server monitoring and tuning, and problem troubleshooting. Prerequisite: IS101 Computer Applications and Concepts 1 or IS100 Introduction to Computer Applications & Concepts, or CI121 Microcomputer Techniques for Science.

## **CI130 Programming in C++**

**Cr-3**

This course provides a comprehensive study of C++ with an emphasis on sound structured programming principles, good style, and top-down method of program design. It covers the designing, coding, executing, and debugging of C++ programs to solve problems in a variety of fields. Corequisite: CI110 Principles of Programming or ES151 Introduction to Engineering.

## **CI132 UNIX Operating System and Security**

**Cr-3**

This course provides an understanding of the UNIX operating system, covering commands, utilities, and scripts. It focuses on the skill development needed to administer a UNIX system, emphasizing file management, security issues, upgrades, and backups. The installation and maintenance of UNIX systems are addressed. Prerequisite: IS101 Computers and Society, or IS100 Introduction to Computers and

Society, or CI121 Microcomputer Techniques for Science or CI104 Introduction to Cybersecurity.

## **CI140 Computer Programming for Engineers and Scientists**

**Cr-3**

This is an introductory course designed to meet the needs of Engineering and Physical science students. The course provides an introduction to a variety of computational and data analysis skills necessary for a scientific and/or engineering career. Topics include computer organization, structured engineering and scientific programming, scientific word processing, spreadsheet and graphical analysis, and presentation techniques. Prerequisite: Three years of college preparatory mathematics including trigonometry.

## **CI142 Computer Forensics**

**Cr-3**

This course covers the acquisition and analysis of data recovery from computer networks to identify potential security or legal evidence. Topics include data recovery after deletion, and the roles and methods of discovering inappropriate data use. It covers operating systems and their vulnerabilities, and techniques about data recovery for use in litigation and future protection. It examines forensic cases. Prerequisite: IS101 Computers and Society, or IS100 Introduction to Computers and Society, or CI104 Introduction to Cybersecurity or CI121 Microcomputer Techniques for Science.

## **CI204 Software Support Strategies**

**Cr-3**

This course provides a comprehensive understanding of technical support and software troubleshooting methods. Best practices and techniques for effective industry communication skills are also explored. Students learn to analyze problems, and develop and implement practical solutions. Students study under the guidance of industry professionals. Prerequisite: CI 112 Networking Fundamentals

## **CI212 Internet Security**

**Cr-3**

The course provides an overview of computers and network security, addressing the balance of access and security in standard practices and performance issues. It covers the effective design, implementation, and support of security policies for large-scale enterprise networks. It deals with preventive and post-event recovery tools. Prerequisite: CI104 Introduction to Cybersecurity or CI112 Networking Fundamentals or CI130 Programming in C++.

## **CI224 Windows Systems Security II**

**Cr-3**

This course helps to develop a comprehensive understanding of Microsoft Windows 2000 Server, or its current version. Topics include server and client hardware selection, server installation and configuration, network printing services, remote access services, network inter-operation, Internet set up, server monitoring and tuning, and problem troubleshooting. Prerequisite: CI124 Windows Systems Security I, and IS101 Computers & Society, or IS100 Introduction to Computers & Society, or CI121 Microcomputer Techniques for Science.

## **CI230 Data Structures**

**Cr-3**

This course introduces advanced programming concepts. It emphasizes data encapsulation and abstraction through development of static and dynamic data structures. It covers stacks, queues, linked lists, trees, and graphs along with recursion as a programming tool as well as searching and sorting techniques. Prerequisite: CI130 Programming in C++.

**CI232 Security Policies****Cr-3**

This course covers the design, implementation, and support of security policies for large-scale enterprise networks. It addresses security analysis/defensive tools, including implementation and circumvention. Prerequisite: IS101 Computers and Society, or IS100 Introduction to Computers & Society, or CI104 Introduction to Cybersecurity, or CI121 Microcomputer Techniques for Science.

**CI233 UNIX Administration & Security****Cr-3**

This course provides students with an understanding of installation, management, and security of the UNIX operating system in a server-based environment. System automation, shell scripting, and disaster recovery are also covered. Prerequisite: CI132 UNIX Operating System and Security.

**CI242 CISCO Networking****Cr-3**

This course addresses LAN and WAN setup and configuration. It covers specific routing protocols and their application to physical networks. It builds upon the vocabulary and theory of networking fundamentals through hands-on experience.

**CI245 JAVA Programming****Cr-3**

This course introduces the concepts of object-oriented programming (OOP) and the general purpose JAVA programming language. Topics include data abstraction, data encapsulation, inheritance, polymorphism, class structures, software design with design patterns, application programming, data types, selection and loop structures, graphical user interface programming, exception handling, data streams, and cryptographic techniques. Prerequisites: CI130 Programming in C++, or permission of the Instructor.

**CI246 Critical Infrastructure Security****Cr-3**

This course provides students with an understanding of the basics of critical infrastructure and its relationship to cybersecurity. Topics include what critical infrastructures are, where they are likely to be found, and their vulnerabilities. Students explore historical trends and known breaches as well as current security challenges facing the industry. Prerequisites: CI132 UNIX OS & Security and CI112 Networking Fundamentals

**CI256 Introduction to Programming for the Internet****Cr-3**

This course introduces the tools needed to create and manage a web site. Topics include history of the Internet and the World Wide Web (WWW), how to access the WWW, goals needed to create a successful web site, page layout programs, and an introduction to Hypertext Markup Language (HTML). It discusses Common Gateway Interface (CGI) scripts and legal issues of copyright on the web. Prerequisite: CI130 Programming in C++ or IS180 Internet for Business

**CI260 Microcomputer Programming****Cr-3**

This course focuses on assembler language programming of the 8086 microprocessors. It reviews of the binary number system and arithmetic operations and signed binary numbers, and studies the architecture of the 8086 and its associated family of chips. It covers addressing modes and their applications with respect to the instruction set. It introduces interfacing techniques in preparation or advanced courses. Prerequisite: CI130 Programming in C++.

**CI271 Database Design & Implementation****Cr-3**

This course covers database management systems and query languages, including relational database and procedural query languages. It includes projects using database file organization, data structures, and development techniques to design application databases. It emphasizes the role of database in system development and information system design. Prerequisite: Any three-credit programming language.

**CI272 Visual Basic****Cr-3**

This course introduces object-oriented programming techniques in a Windows environment. It covers the fundamentals of event driven programming by use of the Rapid Application Development tool Visual Basic. It emphasizes planning, programming, and debugging VB applications using modern programming techniques and practicing good graphical user interface design. Prerequisite: CI130 Programming in C++.

**CI280 Computer Graphics 1****Cr-3**

This course introduces the field of 3D computer graphics. Topics include 2D vector algebra, 3D model creation, 3D transformation theory, texture and shader techniques, lighting effects, camera basics, mesh creation of model resources, user interactivity, animation techniques, and methods for achieving physically realistic behaviors. It uses a professional graphics package and 3D design package to complete programming and laboratory assignments. Prerequisites: CI245 JAVA Programming and MA121 Fundamentals of College Mathematics 1.

**CI285 Systems Operations & Management****Cr-3**

This course introduces operating system concepts, including history, multi-tasking, management of processes, devices, memory and files, scheduling, security, virtual, real-time, and distributed systems. Prerequisite: Any three-credit programming language.