ASSOCIATE IN APPLIED SCIENCE DEGREE IN CYBERSECURITY & NETWORK TECHNOLOGY PROGRAM

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&
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GENERAL EDUCATION REQUIREMENTS: **(20 credits)**

Communications (6 credits)	
ENG 101 College Composition I	3
ENG 102 College Composition II or ENG 105 Technical Writing	3
Social Science (3 credits)	
Select a course from: ANT 101, 105; ECO 101, 102; POL 101, 104; PSY 101, 102, 219; SOC 101, 108, 219	3
Quantitative Knowledge & Skills/Scientific Knowledge & Reasoning (8 credits)	
MTH 100 Introductory College Mathematics	4
Select one math course or one lab science course from: *Math*: MTH 113, 119, 120, 121, 122, 127, 136, 213, 221, 222, or 239 *Lab Science*: BIO 101, 102, 103, 104, 121, 122; CHM101, 102, 103, 104; PHY101, 102, 103, 104, 113, or 114	4
Humanities (3 credits)	
Select one history class from: HST 101, 102, 111, 112,121, 122, 131, 132, 134-137, 161, 162	3

MAJOR COURSE REQUIREMENTS: **(31 credits)**

CSC 104 Network Fundamentals	3
CSC 137 Intro to Programming in Java	4
CSC 113 Intro to Linux/Unix Operating System	4
CSC 114 Computer Networks I	4
CSC 116 Introduction to Computer and Network Security	4
CSC 214 Computer Networks II	4
CSC 226 Network Defense and Countermeasures	4
CSC 230: Computer and Internet Forensics	4

ADDITIONAL COURSE REQUIREMENTS **(10-12 credits)**:

CSC 253 Intro to System and Cloud Administration	4
Approved Ethics Course (3-4 credits – HIT 102	3-4
CSC 250 IT Capstone Project **or** CSC 260 Internship (3 credits) **or** Approved Technical Course	3-4

RECOMMENDED SEQUENCE OF COURSES*:

First Semester
ENG 101 College Composition I (3 credits)
MTH 100 Introductory College Mathematics (4 credits)
CSC 137 Intro to Programming in Java (4 credits)
CSC 104 Network Fundamentals (~~4~~ 3 credits)

Second Semester
Quantitative Knowledge & Skills/Scientific Knowledge & Reasoning (4 credits)
CSC 113 Intro to Linux/Unix Operating System (4 credits)
CSC 114 Computer Networks I (4 credits)
CSC 116 Introduction to Computer and Network Security (4 credits)

Summer
Humanities (3 credits)

Third Semester
Social Sciences (3 credits)
CSC 214 Computer Networks II (4 credits)
CSC 226 Network Defense & Counter Measures (4 credits)
CSC 253 Intro to System and Cloud Administration (4 credits)

Fourth Semester
Communications (3 credits)
Approved Ethics Course (3-4 credits)
CSC 230: Computer and Internet Forensics (4 credits)
CSC 250 IT Capstone Project **or**
CSC 260 Internship **or**
Approved Technical Course

Note: The minimum passing grade for all courses designated is C. If you earn a grade below C, you need to repeat that course.

Total Credits Required for Degree: **61-63**

NOTES:
(1) The two General Education Integrated Course Goals, Ethical Reasoning & Action and Information Literacy, are both addressed by the required curriculum described above, regardless of specific choices made by the individual student.
(2) This plan assumes the completion of all required developmental courses in reading, writing, and mathematics as well as other pre- and co-requisites for some of the courses, as listed in the Course Descriptions section.

C. Curriculum Guide

1. Traditional:

2. Recommend Semester Sequence; (see Table II).

Table II. Recommended Sequence of Courses

Essex County College – Division of Engineering Technologies & Computer Science
New Curriculum Proposal

First Semester
ENG 101 College Composition I (3 credits)
MTH 100 Introductory College Mathematics (4 credits)
CSC 137 Intro to Programming in Java (4 credits)
CSC 104 Network Fundamentals (3 credits)
TOTAL – (14 Credits)

Second Semester
Quantitative Knowledge & Skills/Scientific Knowledge & Reasoning (4 credits)
CSC 113 Intro to Linux/Unix Operating System (4 credits)
CSC 114 Computer Networks I (4 credits)
CSC 116 Introduction to Computer and Network Security (4 credits)
TOTAL – (16 Credits)

Summer
Humanities (3 credits)
TOTAL – (3 Credits)

Third Semester
Social Sciences (3 credits)
CSC 214 Computer Networks II (4 credits)
CSC 226 Network Defense & Counter Measures (4 credits)
CSC 253 Intro to System and Cloud Administration (4 credits)
TOTAL – (15 Credits)

Fourth Semester
Communications (3 credits)
Approved Ethics Course – HIT 102 (3-4 credits)
CSC 230: Computer and Internet Forensics (4 credits)
CSC 250 IT Capstone Project **or**
CSC 260 Internship **or**
Approved Technical Course (3-4 credits)
TOTAL – (13-15 Credits)

TOTAL – (61-63 Credits)

D. Attach description for all new courses

CSC 113 **Course Title: Introduction to Linux/Unix Operating System**

Course Description

Students will be introduced to Linux/UNIX as an open-source computing environment. They will learn how to install and configure Linux/UNIX as both a server operating system and as a desktop operating system. On the server side they will learn how to set up and configure basic network services. On the desktop side they will learn to set up and configure a graphical environment and will learn how to install and configure office-suite applications. Students will become familiar with the UNIX file system structure, editors and shell programming. Students will learn networking in UNIX as well as basic system administration. Students will be able to contrast and compare UNIX with LINUX.

CSC 114: **COURSE TITLE: Computer Networks I**

Course Description

The first half of the semester corresponds to the first CCNA course, Introduction to Networks. The topics covered are the architecture, structure, functions, components, and models of the Internet and computer networks. The principles of IP addressing and fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum.

The second half of the semester corresponds to the second CCNA course, Routing and Switching Essentials. The topics covered are architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality.

CSC 116: **Introduction to Computer & Network Security**

Course Description:

The course provides a foundation in network security fundamentals for those responsible for protecting network services, devices, traffic and data. The topics include the current risks and threats to an organization's data together with a structured way of addressing the safeguarding of these critical electronic assets. Additionally, the course provides the broad-based knowledge necessary to prepare students for further study in other specialized security fields and prepare them to take the Security+ certification.

CSC 137: **COURSE TITLE: Introduction to Programming in Java**

Course Description

This course provides students with the working knowledge required to program Java applications. Students will learn how the Java language supports object-oriented programming, and how object-oriented designs can be implemented in Java. Through lectures, discussions and programming projects, students will develop both conceptual and practical knowledge enabling them to build Java applications from analysis and design to implementation.

CSC 214: **COURSE TITLE: Computer Networks II**

Course Description

The first half of the semester corresponds to the third CCNA course, Scaling Networks. The topics covered are the architecture, components, and operations of routers and switches in a large and complex network. Students learn how to configure routers and switches for advanced functionality.

The second half of the semester corresponds to the fourth CCNA course, Connecting Networks. The topics covered are WAN technologies and network services required by converged applications in a complex network. The course enables students to understand the selection criteria of network devices and WAN technologies to meet network requirements.

CSC 253: **Introduction to System and Cloud Administration**

Course Description:

This course will introduce the tasks and techniques required to perform as a system administrator of Linux systems and introduce the building blocks of most cloud computing solutions. Topics to be covered include: booting, process control, the file system, managing users and resources, backups, configuration management, networking, the network file system, email servers, security, hardware devices, interoperability, daemons, an overview of cloud concepts, which will including delivery models, provisioning, service management, monitoring, and best practices.

CSC 226: **Network Defense & Counter Measures**

Course Description:

Students will learn advanced security technologies and practices to defend and protect network systems; explore topics such as the essential security practices of hardening Windows and Unix/Linux servers, Internet applications and wireless systems, and defending network systems through the use of firewalls and Intrusion Detection Systems; examine the tools and techniques used for traffic and intrusion analysis including hacker tools, methods, scripts and automated hacking malware employed in today's cyber environment; investigate the processes and procedures used by hackers, along with corresponding countermeasures that can be employed to protect against such attacks.

CSC 230: **Computer and Internet Forensics**

Course Description:

This course examines forensics from a computer science perspective: fundamentals of computer forensics and electronic discovery. Topics covered include technical and formal methodologies for conducting security incident investigations; file systems and storage analysis, data hiding techniques, network forensics; projects involving design and use of digital forensic tools.

CSC 250: **IT Capstone Project**

Course Description:

This course is intended for students who are part of the IT Program at Essex County College and who want to enroll in the Capstone Research Project which is part of that program. Each student will develop a proposal for his/her capstone project and then will complete the project as independent study with the oversight of a faculty mentor. Upon completion of the project, the student will make a written report and an oral presentation.

CSC 260: **Information Technology Internship**

Course Description:

This course offers internship opportunities to students. Placements in a variety of private, non-profit, and public agencies are designed to encourage both pre-professional training and the integration of field and classroom experiences. An internship requires that students engage in supervised academic study through participation in an applied setting.