Security Systems

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631-420-2538
School of Engineering Technology

Bachelor of Science Degree

The goal of this program is to provide a positive learning and teaching environment in applied science and technology. The program treats the technical aspects of the discipline in order to educate a new breed security director who integrates crime prevention theory with the design philosophy and hardware and software components of security systems. Criminal justice and security are by their nature information gathering and processing activities and students need to be prepared for a changing work environment where computers will be used extensively. The computer as an integrating technology is emphasized in the program to achieve remarkable effectiveness as well as exceptional efficiency of crime control performance. The Access Control, Computer Forensics, Computer Security, Intrusion Detection, and Security-Imaging Sensor laboratories which house state-of-the-art equipment serve as technical resources for the program. The courseware teaches students how to: manage the movement of people in organizations; detect intrusions on the corporate network; deter acts of corporate espionage and sabotage; and prevent theft of company assets. What is different about this program is that it has been shaped as a digital age curriculum. Students do not simply learn about hardware and software but also are taught how to use it to solve protection problems.

Our program offers students a choice of one of two concentrations, 1) a networking concentration; or 2) a transportation security – aviation concentration. These concentrations are supported by courses from Farmingdale’s Aviation and Computer Systems Departments.

Typical Employment Opportunities

Corporate Security
Federal Law Enforcement Agencies
Local, Municipal, and State Law Enforcement Agencies

Security Systems (BS) Program Outcomes:

- Graduates will have knowledge of advanced computer-based evidentiary and “discovery” data methods, and will be technically competent to administer procedures for evidence identification, documentation, and chain of custody maintenance.
- Graduates will have knowledge to develop comprehensive computer security programs for organizations.
- Graduates will have knowledge to develop protection programs for organizations using an integrated security systems approach.
- Graduates will have an appreciation and understanding of the necessity for personal integrity, professional ethics, and cultural awareness.
### Liberal Arts and Sciences (61 credits)

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>EGL 101 Composition I: College Writing (GE)</td>
<td>3</td>
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<tr>
<td>EGL 102 Composition II: Writing About Literature</td>
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<tr>
<td>PSY 101 Intro to Psychology (GE)</td>
<td>3</td>
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<tr>
<td>SOC 122 Intro to Sociology (GE)</td>
<td>3</td>
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<tr>
<td>Foreign Language (GE)</td>
<td>3</td>
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<tr>
<td>The Arts (GE)</td>
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<tr>
<td>MTH 110 Statistics (GE)</td>
<td>3</td>
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<tr>
<td>Natural Science with a Lab (GE)</td>
<td>4</td>
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<tr>
<td>American/Other World/Western Civilization History (GE)</td>
<td>3</td>
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<tr>
<td>Humanities (GE)</td>
<td>3</td>
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<tr>
<td>Liberal Arts and Sciences Electives*</td>
<td>30</td>
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*Note: The Liberal Arts and Science electives must include:

1. At least 3 credits in General Education
2. At least 9 credits in the Social Sciences
3. At least 12 credits of 200 or higher level courses

### Required Courses in the Major (55 credits)

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>CRJ 100 Introduction to Criminal Justice</td>
<td>3</td>
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<tr>
<td>CRJ 115 Computer Forensics</td>
<td>3</td>
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<td>CRJ 200 Criminal Investigation</td>
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<tr>
<td>CRJ 217 Computer Forensics II</td>
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<td>CRJ 218 Computer Forensics III</td>
<td>3</td>
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<tr>
<td>CRJ 230 Biometrics and Identity Theft</td>
<td>3</td>
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<tr>
<td>CRJ 310 Computer Security I</td>
<td>3</td>
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<td>CRJ 311 Computer Security II</td>
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<td>CRJ 312 Computer Security III</td>
<td>3</td>
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<tr>
<td>CRJ 314 Security Law and Policy</td>
<td>3</td>
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<td>CRJ 323 Network Defense</td>
<td>3</td>
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<td>CRJ 410W Senior Project</td>
<td>3</td>
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<tr>
<td>CRJ 420 Physical Security I</td>
<td>4</td>
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</tbody>
</table>
CRJ 421 Physical Security II        3

Free Electives (6 Credits)

Network Concentration (12 Credits)

BCS 208 Networking Fundamentals I       3
BCS 209 Networking Fundamentals II       3
BCS 320 LAN Switching and Wireless       3
BCS 321 Accessing the WAN       3

OR

Transportation Security (12 Credits)

AVN 280 Intro to Air Cargo Operations-Basic       3
AVN 300W Government in Aviation       3
AVN 400 Aviation Law       3
AVN 417 Homeland Security in Aviation       3

Total Credits: 122

Degree Type: BS
Total Required Credits: 122

Course Descriptions

EGL 101 Composition I: College Writing (GE)
This is the first part of a required sequence in college essay writing. Students learn to view writing as a process that involves generating ideas, formulating and developing a thesis, structuring paragraphs and essays, as well as revising and editing drafts. The focus is on the development of critical and analytical thinking. Students also learn the correct and ethical use of print and electronic sources. At least one research paper is required. A grade of C or higher is a graduation requirement. Note: Students passing a departmental diagnostic exam given on the first day of class will remain in EGL 101; all others will be placed in EGL 097. Prerequisite is any of the following: successful completion of EGL 097; an SAT essay score (taken prior to March 1, 2016) of 7 or higher; an SAT essay score (taken after March 1, 2016) of 5 or higher; on-campus placement testing. Credits: 3

EGL 102 Composition II: Writing About Literature
This is the second part of the required introductory English composition sequence. This course builds on writing skills developed in EGL 101, specifically the ability to write analytical and persuasive essays and to use research materials correctly and effectively. Students read selections from different literary genres (poetry, drama, and narrative fiction). Selections from the literature provide the basis for analytical and critical essays that explore the ways writers use works of the imagination to explore human experience. Grade of C or higher is a graduation requirement. Prerequisite(s): EGL 101 Credits: 3
PSY 101 Intro to Psychology (GE)
This course is designed to present basic psychological concepts and to introduce students to the scientific study of behavior. Core topics include methods of psychological research, the biological bases of behavior, principles of learning, memory and cognition, personality, and psychopathology. Other selected topics to be covered would include the following: motivation and emotion, life-span development, social psychology, health psychology, sensation and perception, intelligence, human sexuality, statistics, and altered states of consciousness. Credits: 3

SOC 122 Intro to Sociology (GE)
This is an introductory course designed to familiarize students with the field of sociology. In addition to learning about the central concepts and major theoretical sociological perspectives, students study human behavior in groups, the organization of social life, the impact of social institutions on individuals, and the process of sociological research. Great emphasis is also placed upon development of students? sociological imagination? specifically, the ability to understand the ways that our individual lives are shaped by larger social forces and institutions. Note: Students who take SOC 122 may not receive credit for SOC 122W. Credits: 3

MTH 110 Statistics (GE)
Basic concepts of probability and statistical inference. Included are the binominal, normal, and chi-square distributions. Practical applications are examined. Computer assignments using Minitab form an integral part of the course. Prerequisite(s): MP2 or MTH 015 Credits: 3

CRJ 100 Introduction to Criminal Justice
Philosophical and historical background of policing throughout the free world; special emphasis is placed on the heritage of British and American policing, the governmental role of law enforcement in society; administration of American justice at all levels of government. The role of technology in law enforcement and crime prevention; history, modes and impact. Credits: 3

CRJ 115 Computer Forensics
This course is an orientation to the study of computer forensic methods. The course will include an analysis of computer hardware that is utilized in forensic investigations such as motherboards, BIOS settings, hard and floppy disk drives and controllers, SCSI controllers and drives and implementations, RAID controllers, boot sequences and related components. Also, this course will introduce the student to methods used in analyzing data storage devices and will include an examination of the physical structures, surfaces and formats of hard disks and other media. Credits: 3

CRJ 200 Criminal Investigation
Introduction to criminal investigation, technical methods used at the crime scene; development of clues, identification of suspects; criminal investigation procedures including the theory of an investigation; conduct at crime scenes; collection and preservation of physical evidence, analysis of the elements that constitute all crimes. Note: The course may be offered as a writing intensive course at the discretion of the Criminal Justice Department. Students cannot get credit for both CRJ 200 and CRJ 200W. Prerequisite(s): CRJ 100 Credits: 3

CRJ 217 Computer Forensics II
Computer Forensics II is a continuation of CRJ 115. This course covers topics such as disk geometry and organization. Master boot sector record and volume record creation and organization, file signatures for data type identification, cyclic redundancy checksum for data integrity validation, and RSA's MD5 hash values for file authentication. Other subjects introduced include the UNIX "grep" search utility, search string techniques and file signature matching, and recovery of files that are intentionally deleted, hidden, or renamed. The course examines advanced computer-based evidentiary and "discovery" data methodologies, and includes a study of evidence identification, documentation, and chain of custody procedures. Prerequisite(s): CRJ 115 Credits: 3
CRJ 218 Computer Forensics III
This course examines federal, state, and local computer fraud statutes to provide the student with a legal foundation to approach computer investigations. The course includes lecture elements that provide the student with the skills necessary to conduct successful computer-related investigations, and includes an examination of the processes involved in preparing an affidavit for a search warrant. Prerequisite(s): CRJ 217 Credits: 3

CRJ 230 Biometrics and Identity Theft
This course will introduce the history of biometrics, physiological/anatomical biometrics (fingerprint, iris, face hand geometry, DNA, ear, vascular, etc), behavioral biometrics (speech/voice, signature, gait, keyboard typing, human biosignal, etc), biometric sensor technology and anti-spoofing, and soft biometrics. Students will learn how each biometric works, and how and why different biometrics should be chosen for different applications, such as online banking, surveillance and transportation security. It also covers the security and privacy issue of biometrics. The course will provide students with an understanding of the nature and scope of Identity Theft and Computer-Related Fraud. Prerequisite(s): CRJ 115 Credits: 3

CRJ 310 Computer Security I
This course focuses on security threats to an organization's data network such as hackers, intruders, industrial espionage and sabotage, fraud and theft. The components of computer security architecture are studied as well as the principles of security networking protocols, encryption, fault tolerance techniques, and file system protection. Additional topics covered include the protection of computer hardware and software. Prerequisite(s): CRJ 310 Credits: 3

CRJ 311 Computer Security II
This course is a continuation of CRJ 310, and includes an analysis of the security features of computer operating systems. The course will review the OSI model and describe how systems communicate with one another. Also included in the course is a detailed study of authentication technologies and how they are used to secure an organization's assets and electronic transactions. Prerequisite(s): CRJ 310 Credits: 3

CRJ 312 Computer Security III
The course examines computer software threats which include the birth, life and termination of computer viruses, their modes of operation, detection techniques, virus signatures and virus removal methods as well as other "virus like" threats which are delivered by e-mail and internet/intranet packets. Prerequisite(s): CRJ 311 Credits: 3

CRJ 314 Security Law and Policy
This course introduces students to the study of security law and security policies. Topics include crimes and offenses encountered by security personnel, application of criminal, civil and administrative law in the security field, employment liability, workplace violence and legal issues in security services. The course will also discuss the security policy formulation process. Students will learn how to develop security policy by incorporating federal regulatory requirements and business demands. Other topics examined are the National Information Infrastructure Protection Act, the Communications Decency Act, and the Communications Privacy Act. Prerequisite(s): CRJ 100 Credits: 3

CRJ 323 Network Defense
This course will discuss the security issues in computer networks and different security mechanisms to protect the secure internal networks and systems. It will involve a study of firewall technologies, including packet filtering, proxying, network address translation, and virtual private networks. An analysis of firewall architectures, such as screening routers, screened hosts, hosts, screened subnets, perimeter networks, and internal firewalls, will be included. It will also discuss the architecture, monitoring strategies, and analysis engines of an intrusion detection system. An analysis of information transformation processes for intrusion detection, such as misuse and anomaly detection, will be covered. Additional topics will include a study of technical issues in intrusion detection such as scalability, interoperability, sensor control, reliability, integration, and user interfaces. Prerequisite(s): CRJ 115 Credits: 3
CRJ 410W Senior Project
Independent study of a Security Systems or related area of interest to both the student and a faculty member who shall act as project Advisor. The project selected will utilize competencies acquired in previous Security Systems and related courses. Credits: 3

CRJ 420 Physical Security I
A study of the theory and practice of managing the movement of people in organizational settings. This lecture course examines the operating principles and applications of access control readers, card encoding technologies, locking assemblies, and system functions such as fail-safe, fail-secure, access levels, time zones, limited and unlimited access privileges, and the like. Also, the course focuses on the role of alarm systems in an organization's overall protection plan, from the control of violence in the workplace to preventing theft of company property. Sensor technologies as well as controls and signaling systems are analyzed and evaluated with applications in the following areas: perimeter, interior, occupant, and object protection. Prerequisite(s): CRJ 323 Credits: 4

CRJ 421 Physical Security II
A continuation of CRJ 420. Advanced topics include a study of camera and lens types, monitors, video signaling systems, scanners, pan and tilt positioning devices, video motion detectors, camera housings and enclosures, switches, multiplexers, time-lapse VCRs, digital video recorders, and their interactive role in the design of CCTV systems. Analysis of illumination technologies, including fluorescent, high and low pressure sodium, metal halide, ultraviolet and infrared light sources. Other topics include the application philosophy as well as the hardware and software components of video surveillance computers, and the analysis of video field and frame compositions with reference to identification issues in criminal cases. An inquiry into the legal and ethical dimensions of surveillance, including Fourth Amendment guidelines, Plain View Doctrine cases, the Expectation of Privacy court cases and directives, and the Exclusionary Rule. Prerequisite(s): CRJ 420 Credits: 3

BCS 208 Networking Fundamentals I
This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IPv4 and IPv6 addressing and the fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes. The laboratory component of this course will give the students hands-on experience configuring equipment needed to build a LAN. Prerequisite(s): Sophomore status Credits: 3

BCS 209 Networking Fundamentals II
This course describes the 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. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks. The laboratory component of this course will give the students hands-on experience configuring routers, switches and basic WAN connectivity. Prerequisite(s): BCS 208 with a grade of C or higher Credits: 3

BCS 320 LAN Switching and Wireless
This course describes the architecture, components, and operations of routers and switches in a larger and more complex network. Students learn how to configure routers and switches for advanced functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with OSPF, EIGRP, STP, and VTP in both IPv4 and IPv6 networks. Students will also develop the knowledge and skills needed to implement DHCP and DNS operations in a network. Note: Students who have completed BCS 330 or BCS 335 may not receive credit for BCS 320. Prerequisite(s): BCS 209 with a C or higher. Credits: 3
BCS 321 Accessing the WAN
This course discusses the Wide Area Network (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. Students learn how to configure and troubleshoot network devices and resolve common issues with data link protocols. Students will also develop the knowledge and skills needed to implement IPSec and virtual private network (VPN) operations in a complex network. Note: Students who have completed BCS 330 or BCS 335 may not receive credit for BCS 321. Prerequisite(s): BCS 209 with a grade of C or higher Credits: 3

AVN 280 Intro to Air Cargo Operations-Basic
The course introduces the student to the growing, technical and multi-faceted air cargo industry. The student will understand the role that air cargo has played in the development of the air carrier industry, contractual and legally binding regulations, and national and international trade. A visit to off-campus air cargo facilities will compliment classroom discussions, lectures and videos. Prerequisite(s): AVN 101 with a grade of C or higher or CRJ 100 Credits: 3

AVN 300W Government in Aviation
This course expands and focuses on many of the regulatory subjects in AVN 101 (Aviation History). It is a study of the constitutional, legislative, executive and judicial control of aviation from the local, state, federal and international perspective. This course forms the foundation for AVN 400 Aviation Law. Students who take AVN 300W cannot receive credit for AVN 300. AVN 300W can be used to fulfill the writing intensive requirement. Prerequisite(s): AVN 101 with a grade of C or better or CRJ 100, Junior or Senior status required. Credits: 3

AVN 400 Aviation Law
Aviation Law develops the student's knowledge to the application level of learning by emphasis on real cases to demonstrate the legal, regulatory and government theory previously discussed in AVN 101 and AVN 300. Emphasis will be on the FAA's roles in regulating aviation including the rule making process, certification of airmen, medical certification and enforcement. Prerequisite(s): AVN 300 or AVN 300W with a grade of C or higher. Credits: 3

AVN 417 Homeland Security in Aviation
This course will expose the student to the importance of Homeland Security in the aviation industry and the important role each employee in the industry is charged with. Students will gain experience in identifying false travel documents and identifying suspicious air travelers. This course will focus on current national security threats in the aviation industry. Upon the successful completion of this course the students will meet the requirements of the initial and recurrent security training requirements mandated by the Transportation Security Administration (TSA) under Title 49 CFR 1552. Prerequisite(s): AVN 300 or 300W with a grade of C or higher. Credits: 3

Admission to Farmingdale State College - State University of New York is based on the qualifications of the applicant without regard to age, sex, marital or military status, race, color, creed, religion, national origin, disability or sexual orientation.