Bachelor of Science in Cybersecurity

Organizations of all sizes face constant cyberthreats and cyberattacks from both internal and external attackers. The cybersecurity bachelor's degree provides a fundamental understanding of cybersecurity theory and know-how required to strategically assess, plan, design, and implement effective cybersecurity defenses in public and private sectors.

Increase your knowledge of cybersecurity resources, tools, laws, and methods with your cybersecurity bachelor's degree. Your cybersecurity courses in the BS in Cybersecurity will provide you with the opportunity to learn from instructors with a wealth of real-world expertise.

Note: The program also has a completer option, which allows associate of science or arts degree holding students to transfer in a minimum of 60 semester hours of credits to expedite completing the degree— please see your advisor for more details.

Degree Program Objectives

In addition to the institutional and degree level learning objectives, graduates of this program are expected to achieve these learning outcomes:

- Compare and contrast the various aspects of cybersecurity including the relationship between cyber defense, cyber operations, cyber exploitations, cyber intelligence, cybercrime, and cyber law within federal and state laws.
- Demonstrate an understanding of the processes and goals of cyber forensics investigations including the importance of search warrants and chain of custody in a forensic investigation of computer-related crimes.
- Develop strategies and plans for security architecture consisting of tools, techniques, and technologies to detect and prevent network penetration, and to design effective cybersecurity countermeasures.
- Analyze network designs, topologies, architectures, protocols, communications, administration, operations, and resource management for wired, wireless, and satellite networks that affect the security of the cyberspace.

Degree at a Glance

Code	Title	Semester Hours
General Education Requirements		30
Major Required		45

Select one of the following concentrations:		15
General Concentration (p. 3)		
Critical Infrastructure (p. 3)		
Digital Forensics (p. 3)		
Privacy and Surveillance (p. 4)		
Wireless and Mobile Security (p. 4)		
Final Program Requirements		3
Elective Requirements		27
Total Semester Hours		120

Degree Program Requirements

General Education Requirements (30 semester hours)

Code	Title	Semester Hours
Arts and Humanities (6 semester hours) [1]		
Select 2 courses from the following:		6
ARAB100	Arabic I	
ARAB101	Arabic II	
ARTH200	Art Appreciation	
ARTH241	Film and Literature	
DSIN141	Image Enhancement using Adobe Photoshop	
FREN100	French I	
FREN101	French II	
GERM100	German I	
GERM101	German II	
JAPN100	Introduction to Japanese	
LITR215	Literature of American Encounters, Revolution, and Rebellion	
LITR218	From Abolition to #MeToo: Literature of the American Civil Rights Movement	
LITR222	Pivotal Figures in Early British Literature	
LITR225	British Literature from Wordsworth through the Wasteland	
LITR231	Leadership in World Literature: Antiquity to the Early Modern Period	
LITR233	Literature of the Newly Globalized World: The Individual's Struggle to Adapt	
MUSI200	Music Appreciation	
MUSI250	World Music and Cultures	
PHIL101	Introduction to Philosophy	
PHIL110	Critical Thinking	
PHIL200	Introduction to Ethics	
PHIL202	Philosophy of Science	

PORT100	Introduction to Brazilian Portuguese	
RELS201	Introduction to World Religions	
RUSS100	Russian I	
SPAN100	Spanish I	
SPAN101	Spanish II	
STEM270	Thinking and Acting Ethically	

Civics, Political and Social Sciences (6 semester hours) [1]

Select 2 courses from the following:		6
ANTH100	Introduction to Anthropology	
ANTH202	Introduction to Cultural Anthropology	
CHFD220	Human Sexuality	
COMM211	Social Media and Society	
COMM240	Intercultural Communication	
ECON101	Microeconomics	
ECON102	Macroeconomics	
EDUC200	Humane Education: A Global Interdisciplinary Perspective	
GEOG101	Introduction to Geography	
HOSP110	Practical Food Safety and Awareness	
IRLS210	International Relations I	
LITR212	Forgotten America--Under Represented Cultures in American Literature	
LITR235	Four Points of the Compass: Culture and Society Around the World	
POLS101	Introduction to Political Science	
POLS210	American Government I	
PSYC101	Introduction to Psychology	
SOCI111	Introduction to Sociology	
SOCI212	Social Problems	
SOCI220	American Popular Culture	
STEM280	Exploring Society and Cultures via Science Fiction	

Communication: Writing, Oral, and Multimedia (9 semester hours)

COMM120	Information and Digital Literacy	3
ENGL110	Making Writing Relevant	3
Select 1 course from the following:		3
COMM200	Public Speaking	
ENGL101	Proficiency in Writing	
ENGL115	Argumentation and Rhetoric	
ENGL210	Introduction to Literature	
ENGL220	Technical Writing	
ENGL221	Scientific Writing	
ENGL226	Effective Business Communication	
HRMT101	Human Relations Communication	
IRLS200	Information Literacy and Global Citizenship	

ITCC231	Introduction to Information Technology Writing	
MGMT100	Human Relations	

History (3 semester hours)

Select 1 course from the following:		3
HIST101	American History to 1877	
HIST102	American History since 1877	
HIST111	World Civilization before 1650	
HIST112	World Civilization since 1650	
HIST121	Western Civilization before The Thirty Years War	
HIST122	Western Civilization since The Thirty Years War	
HIST221	African-American History before 1877	
HIST222	African-American History since 1877	
HIST223	History of the American Indian	
HIST270	History of Science	
STEM185	The History and Context of STEM	

Mathematics and Applied Reasoning (3 semester hours)

MATH110	College Algebra	3

Natural Sciences (3 semester hours)

Select 1 course from the following:		3
BIOL180	Introduction to Biology	
BIOL181	Introduction to Human Anatomy and Physiology	
CHEM180	Introduction to Chemistry	
ERSC180	Introduction to Meteorology	
ERSC181	Introduction to Geology	
EVSP180	Introduction to Environmental Science	
PHYS180	Introduction to Physics	
SPST180	Introduction to Astronomy	
STEM100	Introduction to STEM Disciplines	

Total Semester Hours	30

[1] All literature courses require successful completion of ENGL101 - Proficiency in Writing or ENGL110 - Making Writing Relevant.

Major Required (45 semester hours)

Code	Title	Semester Hours
ISSC242	Hardening Operating Systems	3
ENTD261	Scripting Languages for the Administrator	3
ISSC231	Networking Concepts	3
ISSC290	Securing Databases	3
ITMG281	Law, Privacy, and Digital Data	3
ISSC262	Red and Blue Team Security	3
ISSC266	Cryptography Concepts	3
ISSC325	Biometrics	3
ISSC421	Computer and Network Security	3

ISSC422	Information Security	3
ISSC451	Cybercrime	3
ISSC452	Cybersecurity	3
ISSC481	IT Security: Planning and Policy	3
INTL440	Cyber Warfare	3
MATH302	Statistics	3
Total Semester Hours		45

Students must choose a concentration for this degree program and may select from the General Concentration, Concentration in Critical Infrastructure, Concentration in Digital Forensics, Concentration in Privacy and Surveillance, or Concentration in Wireless and Mobile Security.

General Concentration (15 semester hours)

A general concentration allows you to take courses across a number of areas of study within your program based on your own interests.

Code	Title	Semester Hours
ISSC343	Wireless Networks	3
ITMG481	Ethics in Information Technology	3
INFO222	Database Concepts	3
ISSC368	IT Security: Physical and Peripheral Defense	3
ISSC456	Digital Forensics: Investigating Wireless Networks and Devices	3
Total Semester Hours		15

Concentration in Critical Infrastructure (15 semester hours)

The Bachelor of Science in Cybersecurity with a concentration in Critical Infrastructure provides you with the knowledge to best understand the Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA) systems that run the everyday systems that we depend on from gas, electric, and other utilities to the production of your favorite foods. The concentration will delve into how these systems differ from the devices used by your average computer user, as well as how one can best protect these unique systems from hackers to nation states. You will be exposed to various aspects of systems from Programmable Logic Controllers (PLC) to nuclear power plants. This is a unique field with consistent growth as everyone depends on critical infrastructure virtually nonstop around the clock.

Objectives

Upon successful completion of this concentration, the student will be able to:

- Evaluate risks of Industrial Control Systems (ICS) and Supervisory Control and Data Acquisition (SCADA) systems.
- Explore various federal agencies' roles in protecting the nation's critical infrastructure.
- Identify critical infrastructure components.
- Determine appropriate solutions to mitigate critical infrastructure threats.

Concentration Requirements (15 semester hours)

Code	Title	Semester Hours
HLSS310	Critical Infrastructure Protection	3
ISSC477	ICS and SCADA Security Architecture	3
ISSC478	SCADA Risk Management	3
ISSC479	SCADA Security Standards	3
ISSC480	Threats to SCADA Networks	3
Total Semester Hours		15

Concentration in Digital Forensics (15 semester hours)

Bringing cybercriminals to justice requires individuals with computer forensics skill sets who have the ability to quickly collect, analyze, and present cybercrime evidence. Become familiar with digital forensic measures for security incident response with a concentration in Digital Forensics.

Study how to prevent the loss of sensitive proprietary information and deter future cyberattacks. In addition, you'll learn about common incident response procedures, web attacks, router forensics, email crime, corporate espionage, and steganography in your online courses in digital forensics.

Objectives

Upon successful completion of this concentration, the student will be able to:

- Demonstrate knowledge of incident response procedures, computer investigation processes, digital forensics lab work, and investigative reports.
- Illustrate understanding of wireless network attack forensics, wireless internet use security and access procedures, search warrants, and chain of custody.

Concentration Requirements (15 semester hours)

Code	Title	Semester Hours
ISSC455	Digital Forensics: Investigation Procedures and Response	3
ISSC456	Digital Forensics: Investigating Wireless Networks and Devices	3
ISSC457	Digital Forensics: Investigating Network Intrusions and Cybercrime Security	3
ISSC458	Digital Forensics: Investigating Data and Image Files	3
ISSC459	Digital Forensics: Hard Disc and Operating Systems	3
Total Semester Hours		15

Concentration in Privacy and Surveillance (15 semester hours)

The Privacy and Surveillance concentration provides students with a multifaceted approach not only addressing commonly used tools and methods of surveillance but also privacy considerations. Students will be exposed to how surveillance is both intentional and unintentional. The risk of using various forms of hardware and software will be discussed. Legal and ethical consideration surrounding the impact surveillance has on privacy rights will be addressed.

Objectives

Upon successful completion of this concentration, the student will be able to:

- Demonstrate knowledge of common surveillance technologies.
- Illustrate understanding of how technology impacts population segments differently.

Concentration Requirements (15 semester hours)

Code	Title	Semester Hours
ITMG381	Cyberlaw and Privacy in a Digital Age	3
ISSC473	IoT Surveillance	3
ISSC474	Networking Surveillance	3
ISSC475	Bias in Surveillance	3
ISSC476	Surveillance Legislation and Policy	3
Total Semester Hours		15

Concentration in Wireless and Mobile Security (15 semester hours)

This concentration for the Bachelors of Science in Cybersecurity will allow students to specialize in the methodologies used to secure the networks, hardware – devices, software – apps, and the laws and regulations, policies and procedures, and ethical responsibilities for privacy and security of mobile devices using mobile and wireless network infrastructures. The concentration will emphasize countermeasures taken to harden the security of various aspects of mobile technologies associated to government, military, industry, educational, and private enterprises.

Objectives

Upon successful completion of this concentration, the student will be able to:

- Extrapolate threats and vulnerabilities introduced into the network infrastructures of wireless, mobile, cellular, and satellite technologies.
- Examine current mobile application models, their security framework, and methodologies on hardening the security to safeguard the devices running them and adapt them to higher privacy standards.
- Appraise security hardening techniques for wireless or mobile device technologies based on wireless security principles and current industry standards.
- Investigate forensics of wireless network attacks caused by mobile and wireless peripheral devices, and then evaluate security and access procedures within wireless Internet use of subject search warrants and chain of custody in a forensic investigation.

Concentration Requirements (15 semester hours)

Code	Title	Semester Hours
ISSC412	Mobile Application Security	3
ISSC415	Mobile Device Security	3
ISSC442	Wireless and Mobile Network Security	3
ISSC456	Digital Forensics: Investigating Wireless Networks and Devices	3
ISSC457	Digital Forensics: Investigating Network Intrusions and Cybercrime Security	3
Total Semester Hours		15

Final Program Requirements (3 semester hours)

Code	Title	Semester Hours
ISSC499	Senior Seminar in Cybersecurity (to be taken as the last course before graduation) [1]	3
Total Semester Hours		3

[1] Prerequisite: Completion of a minimum of 106 hours towards your program including ENGL101 or ENGL110.

Elective Requirements (27 semester hours)

Code	Title	Semester Hours
Select any courses not already taken to fulfill the requirements listed above. Credits applied toward a minor or certificate in an unrelated field may be used to fulfill elective credit for the major.		27
Total Semester Hours		27