ECE 5561: Introduction to Cybersecurity

Course Description

Introduction to cybersecurity. Technical fundamentals of data, software, component, network, and system security. Cybersecurity from an organizational and societal view point, including human factors.

Transcript Abbreviation: Intr Cybersecurity
Grading Plan: Letter Grade
Course Deliveries: Classroom, 100% at a distance, Greater or equal to 50% at a distance
Course Levels: Undergrad, Graduate
Student Ranks: Junior, Senior, Masters, Doctoral, Professional
Course Offerings: Spring
Flex Scheduled Course: Never
Course Frequency: Every Year
Course Length: 14 Week
Credits: 3.0
Repeatable: No
Time Distribution: 3.0 hr Lec
Expected out-of-class hours per week: 6.0
Graded Component: Lecture
Credit by Examination: No
Admission Condition: No
Off Campus: Never
Campus Locations: Columbus
Prerequisites and Co-requisites: Prerequisite: Junior, senior, or grad standing, or permission of instructor.
Exclusions: Not open to student with credit for CSE 5471.
Cross-Listings: Cross-listed with CSE 5471

Course Rationale: This course will serve as one of the foundational courses in the cybersecurity curriculum.

The course is required for this unit's degrees, majors, and/or minors: No
The course is a GEC: No
The course is an elective (for this or other units) or is a service course for other units: Yes

Subject/CIP Code: 14.0901
Subsidy Level: Doctoral Course

Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

Course Goals

Become familiar with fundamental cybersecurity concepts, technologies and practices, and develop a foundation for further study in cybersecurity.
Become familiar with fundamentals of data security.
Become familiar with fundamentals of software security.
Become familiar with fundamentals of connection/network security.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Basic concepts and definitions. Historical context. Cybersecurity frameworks.	3.0							
Data Security: Basic cryptography concepts, methods for data integrity and authentication, information storage security.	7.0							
Software security: software design with security requirements, testing, configuration management.	5.0							
Component security: Design, procurement, analysis, and maintenance of tangible components that are integrated into larger systems.	4.0							
Connection security: Security for networked systems, secure transmission models, common types of connection and transmission attacks.	5.0							
System security: System thinking, common system architectures, system management, access, control, and testing.	4.0							
Human security: identity management; personal awareness, understanding and compliance; human behavioral factors; personal data privacy and security.	3.0							
Organizational security: governance and policy strategies for organizations; cybersecurity risk management; legal and regulatory issues.	3.0							
Societal security: cybercrime, cyberlaw, cyberethics, cyberpolicy, privacy.	3.0							
Project presentations on complementary topics: hardware security, infrastructure security, cryptocurrencies etc.	5.0							

Representative Assignments

Case studies
Final project

Grades

Aspect	Percent
Assignments	30%
Midterm Exam	30%
Final project and presentation	40%

ABET-EAC Criterion 3 Outcomes

Course Contribution		College Outcome
	a	An ability to apply knowledge of mathematics, science, and engineering.
	b	An ability to design and conduct experiments, as well as to analyze and interpret data.
	c	An ability to design a system, component, or process to meet desired needs.
	d	An ability to function on multi-disciplinary teams.
	e	An ability to identify, formulate, and solve engineering problems.

Course Contribution		College Outcome
	f	An understanding of professional and ethical responsibility.
	g	An ability to communicate effectively.
	h	The broad education necessary to understand the impact of engineering solutions in a global and societal context.
	i	A recognition of the need for, and an ability to engage in life-long learning.
	j	A knowledge of contemporary issues.
	k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

CpE ABET-EAC Criterion 9 Program Criteria Outcomes

Course Contribution		Program Outcome
*	1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
	2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
*	3	an ability to communicate effectively with a range of audiences
**	4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
	5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
	6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
***	7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

EE ABET-EAC Criterion 9 Program Criteria Outcomes

Course Contribution		Program Outcome
*	1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
**	2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
*	3	an ability to communicate effectively with a range of audiences
**	4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
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Additional Notes or Comments

Changed crosslinstg number to CSE 5471 11/20/20 BLA

Added CSE focuses too exclusions. 11/2420 BL

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