

ECE 5567.01 (Approved): Offensive Security

Course Description

This course will give students an overview of existing offensive computing techniques, which include well known attacks that break confidentiality, integrity and availability of computing resources. Attacks targeting on human weaknesses without taking special care to security will also be discussed.

Transcript Abbreviation: Offensive Security

Grading Plan: Letter Grade

Course Deliveries: 100% 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: 2.0 hr Lec, 2.0 hr Lab

Expected out-of-class hours per week: 5.0

Graded Component: Lecture

Credit by Examination: No

Admission Condition: No

Off Campus: Sometimes

Campus Locations: Columbus

Prerequisites and Co-requisites: CSE 2431, 5431 or graduate standing

Exclusions: Not open to students with credit for CSE 5477.01

Cross-Listings: Cross-listed with CSE 5477.01

Course Rationale: Provide students an opportunity to understand potential attacks techniques available now

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: 14.0101

Subsidy Level: Doctoral Course

Programs

Abbreviation	Description
CpE	Computer Engineering
EE	Electrical Engineering

Course Goals

Be familiar with reconnaissance.
Be familiar with confidentiality attacks.
Be familiar with integrity attacks.
Be familiar with availability attacks.
Be familiar with human weakness attacks.

Course Topics

Topic	Lec	Rec	Lab	Cli	IS	Sem	FE	Wor
Common reconnaissance (e.g., fingerprinting, scanning, data gathering)	3.0		1.0					
Confidentiality attack: side-channel attacks	6.0		3.0					
Confidentiality attack: crypto and password attacks	3.0		2.0					
Confidentiality attack: data leakage attacks (e.g., SQL injection attack)	3.0		2.0					
Integrity attacks: malware attacks (e.g., virus, Trojans, ransomware, kernel rootkits)	3.0		1.0					
Integrity attacks: control flow hijack attacks	3.0							
Availability attacks: Denial of Service (DoS) and Distributed DoS (DDoS) attacks	6.0		2.0					
Human weakness attack (e.g., social engineering attacks)	3.0		1.0					

Representative Assignments

Reconnaissance lab
Side channel attacks lab
Metasploit basic and data leakage lab
Crypto lab
Kernel Rootkit lab
Dos and DDoS lab
Social Engineering lab

Grades

Aspect	Percent
Lab	40%
Course Projects	20%
Final Exam	20%
Midterm Exam	15%
Participation	5%

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.
*	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.

Course Contribution		College Outcome
**	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
**	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
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Additional Notes or Comments

The laboratory assignments are hands-on computer exercises that can be done remotely

Changed title and transcript abbrev Added crosslisting with CSE 11/11/bla

Streamlined the course content with CSE offering

Added CSE 5477.01 as exclusion. 11/24/20 BLA

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