Faculty: Information Technology	
Department: Cybersecurity	Program: Bachelor
Academic Year: 2023/2024	Semester: 1st

Course Plan

First: Course Information

Course No.: 1506440	Course Title: Ethical Hacking in Cyber Security	Credit Hours: 3	Theoretical: 2	Practical: 1
Prerequisite No. and Title: 1506343- Linux Operating System Security Fundamentals	Section No.: 1		Lecture Time: 10-11 (Sun, Tue, Thu)	
Level in JNQF	7			
Type Of Course:	☐ Obligatory University Requirement ☐ Elective University Requirement ☐ Obligatory Faculty Requirement ☐ Elective Faculty Requirement ■ Obligatory Specialization Requirement ☐ Elective Specialization Requirement ☐ Ancillary course			
Type of Learning:	☐ Face-to-Face Learning ■ Blended Learning (2 Face-to-Face + 1 Asynchronous) ☐ Online Learning (2 Synchronous+ 1 Asynchronous)			

Second: Instructor's Information

Course Coordinator				
Name: Dr. Ala'a Al Sherideh			Academic Rank: Assistant Professor	
Office Number: 104 B	Extension Number: 1426		Email: asherideh@zu.edu.jo	
Course Instructor				
Name: Dr. Ala'a Al Sherideh			Academic Rank: Assistant Professor	
Office Number: 104 B	Extension Number: 1426		Email: asherideh@zu.edu.jo	
Office Hours:	Sunday 12:00-1:00	Monday -	Tuesday 12:00-1:00	Wednesday -	Thursday 12:00-1:00

Third: Course Description

This course introduces students to a wide range of topics related to ethical hacking and penetration testing. The course provides an in-depth understanding of how to effectively protect computer networks. The topics cover the tools and penetration testing methodologies used by ethical hackers and provide a thorough discussion of what and who an ethical hacker is and how important they are in protecting corporate and government data from cyber-attacks.

Fourth: Course Objectives

1. Introducing the student to the concepts, theories, principles and practices of Ethical Hacking.
2. Developing the student's ability to deal with Ethical Hacking.
3. Learn key topics in information security, including footprinting, network scanning, malware threats, sniffing, social engineering, denial of service, and session hijacking.
4. Identify and defend against webserver attacks, including wireless and mobile hacking.
5. Be able to evade IDS, firewalls, and honeypots
6. Recognize and address threats that accompany cloud computing and cryptography

Fifth: Learning Outcomes

Level descriptor according to (JNQF)	CILOs Code	CILOs If any CLO will not be assessed in the course, mark NA.	Associated PILOs Code Choose one PILO for each CILO*	Assessment method Choose at least two methods
Knowledge	**K1**	Provide the students with the basic and advanced uses of Ethical Hacking.	**PK3**	• Mid-term Exam • Final Exam
	K2	Critically analyze various recon techniques and their effectiveness.	**PK3**	• Practice • Assignments • Mid-term Exam • Final Exam
	K3	Express the methodologies and techniques used to manipulate with Ethical Hacking	**PK3**	• Mid-term Exam • Final Exam
	K4	Explain the role of digital forensics in criminal investigations.	**PK4**	• Mid-term Exam • Final Exam
Skills	**S1**	Recommend an appropriate ethical hacking handling process.	**PS3**	• Practice • Assignments • Mid-term Exam • Final Exam
	S2	Evaluate a computing-based solution to meet a given set of computing requirements in the context of cyber security.	**PS3**	• Practice • Assignments • Mid-term Exam • Final Exam
	S3	Choose an existing report template, write a report to help an organization identify its vulnerabilities, assess its risks, and prioritize its remediation efforts	**PS3**	• Practice • Assignments • Mid-term Exam • Final Exam
	S4	Examine a number of Ethical hacking tools to outline the vulnerabilities in a system or network.	**PS4**	• Practice • Assignments • Mid-term Exam • Final Exam
	S5	Demonstrate a critical evaluation of an advanced security topic with an independent project.	**PS5**	• Practice • Assignments • Mid-term Exam • Final Exam
Competencies	**C1**	Utilize different techniques for dealing with Ethical Hacking	**PC3**	• Practice • Assignments
	C2	Develop effective communication skills with the students in the proper way to deliver the required skills and providing them with knowledge	**PC4**	• Practice • Assignments

		about Ethical Hacking, techniques and tools.		

*CILOs: Course Intended Learning Outcomes; PILOs: Program Intended Learning Outcomes; For each CILO, the PILO could be the same or different.

Sixth: Learning Resources

Main Reference:	Ethical Hacking: Techniques, Tools, and Countermeasures 4th Edition		
Authors: Michael & Sean-Philip	*Issue No.: 4th*	*Print:*	*Publication Year: 2022*
Additional Sources and Websites:	- CEH v12 Certified Ethical Hacker Study Guide with 750 Practice Test Questions 1st Edition 2023, ISBN-13: 978-1394186921 - Gray Hat Hacking: The Ethical Hacker's Handbook, Sixth Edition 6th Edition 2022, ISBN-13: 978-1264268948 - Ethical Hacking: A Hands-on Introduction to Breaking In, 2021, ISBN-13: 978-1718501874 - Ethical Hacking and Countermeasures: Threats and Defense Mechanisms 002 Edition 2016, ISBN-13: 978-1305883444		
Teaching Type:	■ *Classroom* ■ *Laboratory* ☐ *Workshop* ■ *MS Teams* ■ *Moodle*		

Seventh: Course Structure

Lecture Date	Course Intended Teaching Outcomes (CILOs)	Topics	Teaching Procedures*	Teaching Methods**	References***
15/10/2023	C2, K1	Syllabus Overview	Face-to-Face	Lecture, in class Discussions	Course Plan
17/10/2023	C2, K1	Introduction to Ethical Hacking Information Security Overview, Information Security Threats and Attack Vectors, Penetration Testing Concepts	Face-to-Face	Lecture, in class Discussions	Textbook-Ch1
19/10/2023	C2, K1	Ethical Hacking	Asynchronous	Video, Task	Related Web Pages
22/10/2023	K1, K2	Hacking Concepts, Ethical Hacking Concepts, Information Security Controls	Face-to-Face	Lecture, in class Discussions	Textbook-Ch1
24/10/2023	K1, K2	Foot Printing and Reconnaissance Footprinting Concepts	Face-to-Face	Lecture, in class Discussions	Textbook-Ch2, CEH v12
26/10/2023	K1, K2	Types of Footprinting	Asynchronous	Video, Task	Related Web Pages
29/10/2023	S2, K2, K3, K4	Footprinting through Search Engines, Footprinting through Web Services	Face-to-Face	Lecture, in class Discussions	Textbook-Ch2, CEH v12
31/10/2023	S2, K2, K3, K4	Footprinting Tools	Face-to-Face	Lecture, in class Discussions	Textbook-Ch2, CEH v12

2/11/2023	S2, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Perform footprinting on the target network using search engines, web services, and social networking sites • Perform website, email, whois, DNS, and network footprinting on the target network	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch2, CEH v12
5/11/2023	S2, K2, K3, K4	Scanning Networks Network Scanning Concepts	Face-to-Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch3, CEH v12
7/11/2023	S2, K2, K3, K4	Scanning Tools, Scanning Techniques	Face-to-Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch3, CEH v12
9/11/2023	S2, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Perform footprinting on the target network using search engines, web services, and social networking sites • Perform website, email, whois, DNS, and network footprinting on the target network	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch3, CEH v12
12/11/2023	S2, K2, K3, K4	Enumeration Enumeration Concepts	Face-to-Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch4, CEH v12
14/11/2023	S2, K2, K3, K4	Enumeration Techniques	Face-to-Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch4, CEH v12

16/11/2023	S2, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools . • Perform NetBIOS, SNMP, LDAP, NFS, DNS, SMTP, RPC, SMB, and FTP Enumeration	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch4, CEH v12
19/11/2023	S2, K2, K3, K4	Vulnerability Analysis Vulnerability Assessment Concepts	Face-to-Face	Lecture, in class Discussions	Textbook-Ch5, CEH v12
21/11/2023	S2, K2, K3, K4	Vulnerability Assessment Tools, Vulnerability Assessment Reports	Face-to-Face	Lecture, in class Discussions	Textbook-Ch5, CEH v12
23/11/2023	S2, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Perform vulnerability research using vulnerability scoring systems and databases • Perform vulnerability assessment using various vulnerability assessment tools	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch5, CEH v12
26/11/2023	S2, K2, K3, K4	System Hacking System Hacking Concepts	Face-to-Face	Lecture, in class Discussions	Textbook-Ch6, CEH v12
28/11/2023	S2, K2, K3, K4	Cracking Passwords	Face-to-Face	Lecture, in class Discussions	Textbook-Ch6, CEH v12
30/11/2023	S2, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Perform Online active online attack to crack the system's password • Perform buffer overflow attack to gain access to a remote system	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch6, CEH v12

		• Escalate privileges using privilege escalation tools			
Midterm Exam 3/12/2023 – 14/12/2023					
3/12/2023	S1, S3, K1, K2, K3, K4	Malware Threats Malware Concepts	Face to Face	Lecture, in class Discussions	Textbook-Ch7, CEH v12
5/12/2023	S1, S3, K1, K2, K3, K4	Malware Analysis	Face to Face	Lecture, in class Discussions	Textbook-Ch7, CEH v12
7/12/2023	S1, S3, K1, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Gain control over a victim machine using Trojan • Infect the target system using a virus • Perform static and dynamic malware analysis	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch7, CEH v12
10/12/2023	S1, S3, K1, K2, K3, K4	Sniffing Sniffing Concepts, Sniffing Techniques	Face to Face	Lecture, in class Discussions	Textbook-Ch8, CEH v12
12/12/2023	S1, S3, K1, K2, K3, K4	Sniffing Tools	Face to Face	Lecture, in class Discussions	Textbook-Ch8, CEH v12
14/12/2023	S1, S3, K1, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools . • Perform MAC flooding, ARP poisoning, MITM, and DHCP starvation attack • Spoof a MAC address of a Linux machine • Perform network sniffing using various sniffing tools • Detect ARP poisoning in a switch-based network	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch8, CEH v12
17/12/2023	C1, C2	Social Engineering	Face to Face	Lecture, in class Discussions	Textbook-Ch9, CEH

		Social Engineering Concepts & Techniques			v12
19/12/2023	S4, S5, K1, K2, K3, K4	Impersonation on Social Networking Sites	Face to Face	Lecture, in class Discussions	Textbook-Ch9, CEH v12
21/12/2023	S4, S5, K1, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Perform social engineering using Various Techniques • Spoof a MAC address of a Linux machine • Detect a phishing attack Audit an organization's security for phishing attacks	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch9, CEH v12
24/12/2023	S4, S5, K1, K2, K3, K4	DoS/DDoS Concepts, DoS/DDoS Attack Techniques	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch10, CEH v12
26/12/2023	S4, S5, K1, K2, K3, K4	DoS/DDoS Attack Tools	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch10, CEH v12
28/12/2023	S4, S5, K1, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Perform a DoS and DDoS attack on a target host • Detect and protect against DoS and DDoS attacks	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch10, CEH v12
31/12/2023	S4, S5, K1, K2, K3, K4	Session Hijacking Concepts	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch11, CEH v12
2/1/2024	S4, S5, K1, K2, K3, K4	Session Hijacking Tools	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch11, CEH v12
4/1/2024	S4, S5, K1, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools . • Perform session hijacking using various tools • Detect session hijacking	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch11, CEH v12

7/1/2024	S4, S5, K1, K2, K3, K4	IDS, Firewall and Honeypot Concepts	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch12, CEH v12
9/1/2024	S4, S5, K1, K2, K3, K4	IDS, Firewall and Honeypot Solutions	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch12, CEH v12
11/1/2024	S4, S5, K1, K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools. • Bypass Windows Firewall • Bypass firewall rules using tunneling • Bypass antivirus	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch12, CEH v12
14/1/2024	S4, S5, K1, K2, K3, K4	Hacking Web Servers Web Server Concepts	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch13, CEH v12
16/1/2024	C1, C2, S2, K1 K2, K3, K4	Web Server Attacks	Face to Face	Lecture, in class discussions, and/or problem solving	Textbook-Ch13, CEH v12
18/1/2024	C1, C2, S2, K1 K2, K3, K4	Describe (documents or video) one or more from these topics using the special tools . • Perform web server reconnaissance using various tools • Enumerate web server information • Crack FTP credentials using a dictionary attack	Asynchronous	Video, Practice, Assignment	Related Web Pages, Textbook-Ch13, CEH v12
Final Exam 21/1/2024-1/2/2024					

*Teaching procedures: (Face-to-Face, synchronous, asynchronous).   ** Teaching methods: (Lecture, video….).

*** Reference: (Pages of the book, recorded lecture, video….)

Eighth: Assessment Methods

Methods	Online Learning	Blended Learning	Face-To-Face Learning	K1	K2	K3	K4	S1	S2	S3	S4	S5	C1	C2
				**If any CILO will not be assessed in the course, mark NA. (Specific Course Output to be assessed)										
First Exam														
Second Exam														
Mid-term Exam		30		✓	✓	✓	✓		✓					✓
Participation														
Asynchronous Activities		20		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Quizzes														
Assignments														
Group presentation														
Final Exam		50		✓	✓	✓	✓	✓	✓	✓	✓	✓		
Total out of 100		100												

Ninth: Course Policies

- All course policies are applied to all teaching patterns (online, blended, and face-to-face Learning) as follows:
  a. Punctuality.
  b. Participation and interaction.
  c. Attendance and exams.
- Academic integrity: (cheating and plagiarism are prohibited).

Approval	Name	Date	Signature
Head of Department	Dr. Mohammad Rasmi AL-Mousa	12/10/2023	
Faculty Dean	Prof. Dr. Mohammad Hassan	12/10/2023	