Faculty: Information Technology	
Department: Cybersecurity	**Program: Master**
Academic year:	**Semester:**

Course Plan

First: Course Information

Course No.: 1506768	***Course Title: Blockchain***	***Credit Hours: 3***	***Theoretical:3***	***Practical: 0***
Prerequisite No. and Title:	***Section No.:***	***Lecture Time:***		
Level in JNQF	***9***			
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:	***Academic Rank:***		
Office Number:	***Extension Number:***	***Email:***	
Course Instructor:			
Name:	***Academic Rank:***		
Office Number:	***Extension Number:***	***Email:***	
Office Hours:	***Sunday Monday Tuesday Wednesday Thursday***		

Third: Course Description

This course delves deep into the fundamental concepts and practical applications of blockchain, covering topics such as decentralized ledgers, smart contracts, consensus mechanisms, and cryptographic principles. Through a combination of engaging lectures, hands-on exercises, and real-world case studies, participants will gain a profound understanding of how blockchain revolutionizes industries, enhances security, and fosters innovation. Whether you're looking to explore the basics or refine your expertise, this course provides a dynamic and accessible learning experience, empowering you to navigate the rapidly evolving landscape of blockchain technology with confidence.

Fourth: Course Objectives

1. **Foundational Understanding:** Master the basics of blockchain, covering decentralized ledgers, cryptographic principles, and consensus mechanisms.
2. **Practical Application:** Gain hands-on experience with blockchain tools through exercises and case studies, developing practical skills for real-world scenarios.
3. **Industry Applications:** Explore how blockchain revolutionizes industries, enhancing security, driving innovation, and identifying opportunities for implementation.
4. **Smart Contract Mastery:** Learn the ins and outs of smart contract development, enabling the design, deployment, and management of self-executing contracts.
5. **Stay Current:** Stay informed about the latest trends and advancements in blockchain, ensuring you adapt and thrive in the evolving landscape of this transformative technology.

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**	Define key terms like blockchain, distributed ledger technology, cryptography, and consensus mechanisms.	**PK1**	Mid-term Exam Final Exam
	K2	Underline the core principles and architecture of blockchain systems.	**PK1**	Mid-term Exam Final Exam
	K3	Relate different types of blockchains (e.g., public, private, permissioned) to their respective use cases.	**PK2**	Mid-term Exam Final Exam
Skills	**S1**	Compare the strengths and weaknesses of different blockchain platforms.	**PS1**	Mid-term Exam Final Exam
	S2	Develop basic smart contracts using a popular blockchain language.	**PS2**	Mid-term Exam Final Exam
	S3	Recognize potential security vulnerabilities and risks associated with blockchain systems.	**PS3**	Mid-term Exam Final Exam
	S4	Construct a simple blockchain-based application	**PS3**	Mid-term Exam

		for a given problem.		Final Exam
	S5	Analyze the potential impact of blockchain on specific industries and sectors.	**PS3**	Mid-term Exam Final Exam
Competencies	**C1**	Work effectively in teams to design and implement blockchain projects.	**PC1**	Participation Project
	C2	Exhibit leadership by presenting and communicating blockchain concepts to diverse audiences.	**PC2**	Participation Project

*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 Book:	Mastering Blockchain,		
Author: Imran Bashir	***Issue No.:*** 4th ed.	***Print:*** – Packt Publishing,	***Publication Year:*** 2023
Additional Sources: Website:	• Arshdeep Bahga and Vijay Madisetti. Blockchain Applications: A Hands-On Approach, VPT, 2017. • Alan T. Norman. Blockchain Technology Explained: The Ultimate Beginner's Guide About Blockchainm,Wallet, Mining, Bitcoin, Ethereum, Litecoin, Zcash, Mo		
Teaching Type:	■***Classroom*** □ ***Laboratory*** □***Workshop*** ■ **MS Teams** ■ **Moodle**		

Seventh: Course Structure

Week	Course Intended Teaching Outcomes (CILOs)	Topics	Teaching Procedures*	Teaching Methods**	References***
1	K1, K2, S1 S2	**Introduction** History and evolution of blockchain Key concepts: decentralization , immutability consensus mechanisms.	Face-to-Face	Lecture Preparation	---------
	K1, K2, S1 S2	Summarize A timeline and history of blockchain technology	Asynchronous	Asynchronous	Chapter 1
2	K1, K2, K3, S2 S3	**Cryptography for Blockchain** Cryptographic principles in blockchain. Public and	Face-to-Face	Lecture Preparation	Chapter 2

		private keys.			
	K1, K2, S2 S3	Summarize: Introduction for Blockchain and Money	Asynchronous	Asynchronous	Chapter 2
3	K1, K2, S3 S5	**Cryptography for Blockchain** Hash functions, digital signatures, and Merkle trees. Securing data on the blockchain.	Face-to-Face	Lecturing with active participation	Chapter 2
	K1, K2, S3 S5	Answer Questions Types of Blockchain	Asynchronous	Asynchronous	Chapter 2
4	K1, K2, K3, S1 S2	**Building a Simple Blockchain** Understanding the data structure of a block. Creating a basic blockchain in Python.	Face-to-Face	Lecturing with active participation	Chapter 2
	K1, K2, K3, S1 S2	Answer Questions Cryptography in Blockchain	Asynchronous	Asynchronous	Chapter 2
5	K1, K2, K3, S3 S5	**Building a Simple Blockchain** Implementing proof-of-work consensus. Mining and adding transactions.	Face-to-Face	Lecturing with active participation	Chapter 2
	K1, K2, K3, S3 S5 C1	Summarize Smart Contracts and	Asynchronous	Asynchronous	Chapter 2

		DApps			
6	K1, K2, K3, S3,	**Ethereum and Smart Contracts** Introduction to Ethereum. Solidity programming language.	Face-to-Face	Lecturing with active participation	Chapter 3
	K1, K2, K3, S3 S5	Answer Questions Merkle Tree in Blockchain	Asynchronous	Asynchronous	Chapter 3
7	K1, K2, K3, S3,S4 S5	**Ethereum and Smart Contracts** Developing and deploying a simple smart contract. Interaction with smart contracts.	Face-to-Face	Lecturing with active participation	Chapter 3
	K1, K2, K3, S3,S4 S5 C1, C2	Summarize The Basics of Web3	Asynchronous	Asynchronous	Chapter 3
8	K1, K2, K3, S3,S4 S5	**Web3 and Decentralized** Applications (DApps) Using the Web3.py library to interact with Ethereum.	Face-to-Face	Lecturing with active participation	Chapter 3
	K1, K2, K3, S3,S4 S5, C1, C2	Summarize Financial System Challenges & Opportunities	Asynchronous	Asynchronous	Chapter 3
Midterm Exams					
9	K1, K2, K3,S1, S2.	**Web3 and Decentralized** Developing a simple	Face-to-Face	Lecturing with active participation	Chapter 3

		decentralized application (DApp)			
	K1, K2, K3, C3, S1, S2.	Summarize Payments	Asynchronous	Asynchronous	Chapter 3
10	K1, K2, K3, S3 S5	DApp architecture and user interface.	Face-to-Face	Lecturing with active participation	Chapter 3
	K1, K2, K3, S3 S5 C1, C2	Summarize Ethereum Blockchain Tutorial	Asynchronous	Asynchronous	Chapter 3
11	K1, K2, K3, S1 S2	**Blockchain Use Cases** Case studies of real-world blockchain applications.	Face-to-Face	Lecturing with active participation	Chapter 3
	K1, K2, K3, S1 S2	Answer Questions Wallet and How Does It Work?	Asynchronous	Asynchronous	Chapter 3
12	K1, K2, K3, S3 S5	**Blockchain Use Cases** Exploring DeFi, supply chain use cases.	Face-to-Face	Lecturing with active participation	Chapter 4
	K1, K2, K3, S3 S5	Project Proposal	Asynchronous	Asynchronous	Chapter 4
13	K1, K2, K3, S1 S2	Other important use cases	Face-to-Face	Lecturing with active participation	Chapter 4
	K1, K2, K3, S1 S2	Project implementation	Asynchronous	Asynchronous	Chapter 4
14	S3, S4 S5 C1, C2, C3	Project presentations and demos.	Face-to-Face	Lecturing with active participation	
	S3, S4 S5 C1, C2, C3	Project presentation	Asynchronous		
Final Exams					

*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	Specific Course Output to be assessed. **If any CILO will not be assessed in the course, mark NA.									
				K1	K2	K3	S1	S2	S3	S4	S5	C1	C2
First Exam													
Second Exam													
Mid-term Exam		30		✓	✓	✓	✓	✓	✓	✓	✓		
Participation												✓	✓
Asynchronous Activities		15											
Quizzes		5											
Assignments		10										✓	✓
Group presentation												✓	✓
Final Exam		40		✓	✓	✓	✓	✓	✓	✓	✓		
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			
Faculty Dean			