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 for a given problem.	**PS3**	Mid-term Exam 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.	Face-to-Face	Lecture Preparation	Chapter 2

		Public and 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	Summarize	Asynchronous	Asynchronous	Chapter 2

		C1	Smart Contracts and 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**	Face-to-Face	Lecturing with active participation	Chapter 3

		Developing a simple 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			