QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Cyber Security Department

Study plan No.	**2024/2025**		**University Specialization**		**Cybersecurity**
Course No.	0133102		**Course name**		Emerging Topics in Information Technology
Credit Hours	**3**		**Prerequisite Co-requisite**		**أساسيات تكنولوجيا المعلومات**
Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	☐ Support course family requirements	☐ ✓ **Mandatory requirements** ☐ Elective requirements
Teaching style	☐ **Full online learning**		☐ Blended learning		☐ ✓ Traditional learning
Teaching model	☐ 2Synchronous: 1asynchronous		☐ 2 face to face : 1synchronous		☐ **3 Traditional**

Faculty member and study divisions information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail	
Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**

Brief description

This course explores modern topics in information technology, including foundational principles of cybersecurity and artificial intelligence. It emphasizes emerging trends and their implications for the field of IT. Students will gain hands-on experience with basic tools and frameworks to analyze contemporary IT challenges.

Learning resources

Course book information (Title, author, date of issue, publisher ... etc)	Andriessen, J., Schaberreiter, T., Papanikolaou, A. and Röning, J. eds., 2022. Cybersecurity Awareness (Vol. 1). Springer. "Artificial Intelligence Basics: A Non-Technical Introduction" by Tom Taulli, 2019.			
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1. "Artificial Intelligence Basics: A Non-Technical Introduction" by Tom Taulli, 2019. 2. "Cybersecurity for Beginners" by Raef Meeuwisse, 2020. 3. "Oakley, J., Butler, M., York, W., Puckett, M. and Sewell, J.L., 2022. Theoretical Cybersecurity. Apress. 4. "AI in Practice: Examples from the Real World" by Bernard Marr, 2021.			
Supporting websites				
The physical environment for teaching	☐ **Class room**	☐ labs	☐ **Virtual educational**	☐ Others

			platform	
Necessary equipment and software	-			
Supporting people with special needs				
For technical support	**E-learning and Open Educational Center. Computer Center**			

Course learning outcomes (S= *Skills, C= Competences K= Knowledge,)*

No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	Explain the historical evolution of computing technologies, from early mechanical calculators to modern AI-driven systems and their associated security challenges.	**MK1**
K2	Describe the fundamental principles of computer networks and outline their development and current trends.	**MK2**
K3	Demonstrate understanding of core concepts in digital transformation, artificial intelligence, machine learning, and cybersecurity within contemporary IT environments.	**MK3**
	Skills	
S1	Analyze emerging IT technologies—such as AI, ML, and cybersecurity threats—and evaluate their implications for modern digital systems.	**S1**
S2	Apply introductory tools and techniques related to machine learning, network analysis, and basic cybersecurity practices to address real-world IT problems.	**S2**
	Competences	
C1	Work independently and collaboratively to research, prepare, and present emerging IT topics, demonstrating professional responsibility, communication skills, and commitment to continuous learning.	**C1**

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
First exam	0	**0**	0	0
Second / midterm exam	%30	**%30**	%30	%30
Participation / practical applications	0	**0**	0	0
Asynchronous interactive activities	%30	**%30**	%30	%30
final exam	%40	**%40**	%40	%40

Note: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
1	Introduction to the Course + Overview of Emerging Technologies	Lecture + Discussion	Instructor Notes
2	The Evolution of Computers: Mechanical to Electronic Systems	Lecture + Video Analysis	Computer History Texts
3	Evolution Towards AI-Driven Systems and Modern Challenges	Lecture + Case Studies	AI Foundations Books
4	Introduction to Computer Networks	Lecture + Problem-Solving	Networking Essentials (Cisco/CompTIA)
5	Network Architecture, Protocols & Evolution of Networking	Lecture + Group Activity	Computer Networks – Tanenbaum
6	Digital Transformation: Concepts, Drivers & Applications	Lecture + Real-world Examples	Digital Transformation Handbook
7	Digital Transformation in Industries (Banking, Health, Education)	Seminar + Group Presentation	Industry Reports
8	**Midterm Exam**	—	—
9	Introduction to Artificial Intelligence	Lecture + Demonstration	Artificial Intelligence – Russell & Norvig
10	Machine Learning: Concepts & Types	Lecture + Hands-on Practice	Machine Learning – Tom Mitchell
11	Machine Learning Algorithms (Supervised/Unsupervised)	Lab + Problem Solving	ML Online Resources
12	Cybersecurity: Fundamentals & Threat Landscape	Lecture + Case Study	Cybersecurity Essentials
13	Cybersecurity Solutions: Tools, Practices & Defense Strategies	Lab + Scenario Simulation	NIST Cybersecurity Framework
14	Emerging Trends in IT: Cloud, IoT, Big Data, Quantum Computing	Seminar + Student Presentations	IT Trends Reports
15	Final Review and Preparation		
16	Final exam		

*** Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.**

**** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.**

Schedule of asynchronous interactive activities (in the case of e-learning and blended learning)

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Week	Task / activity	Reference	Expected results
1	Project-Based Learning Activity 1: "The Evolution of Computers & Future Directions"	Stair & Reynolds (2021); Morley & Parker (2020); Ceruzzi (MIT Press); IEEE CS History **Computer History Museum – Timeline of Computing** https://computerhistory.org/timeline/ A complete interactive timeline covering mechanical calculators, early computers, microprocessors, and modern IT innovations.	Student groups create a **timeline-based interactive presentation** showing the evolution of computers—from mechanical calculators to AI-powered systems. They highlight how each generation changed society and impacted modern IT..
2	Project-Based Learning Activity 2: "Artificial Intelligence & Machine Learning in Real Life"	Russell & Norvig (2021); Mitchell (ML); Goodfellow et al.; IBM AI Use Cases **Google AI – How Machine Learning Works** https://ai.google/education/ Clear explanations of ML types, AI applications, real-world examples, and simplified workflows suitable for student presentations.	Project Description--Each group selects one real-world AI/ML application (healthcare, finance, education, transport, marketing, etc.) and prepares a presentation explaining how the system works and the machine-learning model behind it
3	Project-Based Learning Activity 3: "Cybersecurity Challenge: Defend a Digital System"	Stallings (Security); Pfleeger; NIST CSF; ISO 27001; Cisco Security Reports **NIST Cybersecurity Framework Overview** https://www.nist.gov/cyberframework The official U.S. cybersecurity framework with simple diagrams, threat categories, and recommended defense strategies.	Project Description--Groups act as cybersecurity consultants. Each group chooses a digital system (university portal, online store, hospital system, banking app, etc.) and prepares a presentation proposing a security plan