جامعة الزيتونة الأردنية

Al-Zaytoonah University of Jordan

Course Syllabus

According to JORDAN National Qualification Framework (JNQF)

Course Name: computer networks

Course Number: 0130214

General Course Information:

Course Title	Computer networks
Course Number	0130214
Credit Hours	3
Education Type	Blended learning
Prerequisites/Co-requisites	Fundamentals of Information Technology
Academic Program	Computer science
Program Code	130
Faculty	Faculty of Science and Information Technology
Department	Computer Science
Level of Course	2
Academic Year /Semester	2024/2025 2st Semester
Awarded Qualification	BS'c
Other Department(s) Involved in Teaching the Course	-
Language of Instruction	English
Date of Production/Revision	6/3/2025

Course Coordinator:

Coordinator's Name	Prof. Mohammad Al Rawajbeh
Office No.	9317
Office Phone Extension Number	419
Office Hours	Sunday: 9:30-11, 12:30-13:30 Monday:11:00-12:30 Tuesday: 9:30-11:00, 12:30-13:30 Wednesday: 11:00-12:30.
E-mail	m.rawajbeh@zuj.edu.jo

Other Instructors:

Instructor Name	
Office No.	
Office Phone Extension Number	
Office Hours	
Email	

Course Description *(English/Arabic)*:

English	This module provides an introduction to the principles, architecture, and protocols of computer networks. Topics include network models (OSI and TCP/IP), data transmission, routing, switching, and wireless communication. Students will explore concepts such as IP addressing, network security, and the functionality of key protocols like HTTP, FTP, and DNS. The course includes practical assignments in configuring and troubleshooting networks using tools and simulations. By the end of the module, students will understand how networks enable communication between devices and support the internet and other distributed systems.

Arabic	تُقدّم هذه المادة مقدمةً لمبادئ شبكات الحاسوب وبنيتها وبروتوكولاتها. تشمل المواضيع نماذج الشبكات (OSI وTCP/IP)، ونقل البيانات، والتوجيه، والتبديل، والاتصالات اللاسلكية. سيستكشف الطلاب مفاهيم مثل عنونة IP، وأمن الشبكات، ووظائف البروتوكولات الرئيسية مثل HTTP وFTP وDNS. تتضمن المادة واجباتٍ عمليةً في تهيئة الشبكات واستكشاف أخطائها وإصلاحها باستخدام أدواتٍ ومحاكاة. بنهاية الوحدة، سيتمكن الطلاب من فهم كيفية تمكين الشبكات للاتصال بين الأجهزة ودعم الإنترنت والأنظمة الموزعة الأخرى.

Textbook: ***Author(s), Title, Publisher, Edition, Year, Book website.***

Kurose, Computer Networking, 8e Paperback, Pearson Education, 31 May 2022.

References: ***Author(s), Title, Publisher, Edition, Year, Book website.***

Bernard Clem Networking and Communications for Beginners: A Practical Guide to Understanding Networks, Protocols, and Modern Communication Technologies, Independently published (April 4, 2025).

Andrew S. Tanenbaum rije University, Amsterdam, The Netherlands" Computer Networks," 6th edition.Published by Pearson (July 14, 2021) © 2021

Course Educational Objectives (CEOs):

1.	**Gain a comprehensive Understanding of the concepts of computer networks**
2.	Develop a strong foundation about reference Models OSI and TCP/IP layers and Protocols
3.	Explore the various network components, topologies, and technologies
4.	learn the basic design of simple network configurations

Intended Learning Outcomes (ILO's):

Intended learning outcomes (ILOs)		**Relationship to CEOs**	**Contribution to PLOs**	**Bloom Taxonomy Levels***	**JNQF Descriptors****
K- Knowledge and Understanding					
ILO1-K	Describe terminologies, technologies, and classifications of computer network	1	3	Understanding	K
ILO2-K	Explain specific functions belonging to each OSI model layer.	2	3	Understanding	K

ILO3-K	Understanding TCP/IP model and its protocols	2	3	Understanding	K
	S- Intellectual skills				
ILO4-S	Describe the structure of IP address and the requirement for sub netting	3	3	Analysing	S
ILO5-S	Compare the benefits and limitations of different networking media	3	3	Analysing	S
	C- Competencies				
C1	Ability to construct and analyze a simple network.	4	5	creating	c
	D- Transferable skills				
D1					

*Bloom Taxonomy Levels:						
Level #	1	2	3	4	5	6
Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating
** Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.						

Program Learning Outcome (PLOs):

(PLOs)	JNQF Descriptors**			
	K	**S**	**C**	**T**

PLO1-K	Knowledge of professional ethics, social responsibility, and the regulations governing them.	✓			
PLO2-K	Understanding various programming techniques, the stages of software development, and the fundamental principles of security.	✓			
PLO3-S	Skill in applying mathematical concepts to analyze and design algorithms and verify their correctness		✓		
PLO4-S	Skill in using different programming languages and applying them to develop software and computer applications.		✓		
PLO 5 C- 1	The ability to analyze, design, and develop effective and reliable computer programs that meet user requirements and adhere to professional ethics.			✓	
PLO6-C2	The ability to keep up with continuous advancements in computer science, innovate, and work independently or as part of a team.			✓	
PLO7-T	The ability to work collaboratively, communicate effectively, and demonstrate teamwork spirit.				✓

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule *(please choose the type of teaching)*

☐ Face to Face (F2F)

☐ **Hybrid** *(One – To - One)*

☐ Online

Schedule of Simultaneous and their Topics:

Week	First Lecture (F2F)	Second Lecture (F2F)	ILOs	PLOs	JNQF Descriptors*
1	Introduction to Networking Network Models Peer-to-Peer Network Model Client-Server Network Model Client-Server Applications		1	PLO2	K
2	**Networking Standards and the OSI Model.** - **The OSI Model.** - Application Layer - Presentation Layer - Session Layer - Transport Layer - Network Layer - Data Link Layer Physical Layer . .	Video about Layers functionality and encapsulation+assignment	2	PLO1	K
3	**Transmission Basics and Networking Media**	Assignment examples of data flow modes	5	PLO-3	S

	– Analog and Digital Signaling , Data Modulation – Simplex, Half-Duplex, and Duplex – Multiplexing Relationships Between Nodes				
4	**Introduction to TCP/IP Protocols** – Characteristics of TCP/IP (Transmission Control Protocol/Internet Protocol) – The TCP/IP Core – TCP (Transmission Control Protocol) UDP (User Datagram Protocol	Video about TCP/IP protocol application + assignment	**3**	**PLO-5**	C
5	– IP (Internet Protocol) – ICMP (Internet Control Message Protocol) – IGMP (Internet Group Management Protocol) – ARP (Address Resolution Protocol	Video bout TCP/IP protocol application + assignment	**3**	PLO-4	C
6	– **Application Layer Protocols** – FTP (File Transfer Protocol) – TFTP (Trivial File Transfer Protocol) – NTP (Network Time Protocol)	Simulation video Wireshark analysis for different packets based on adopted protocol	**3**	PLO-2	K

	– NNTP (Network News Transfer Protocol PING (Packet Internet Groper)				
7	**Topologies and Ethernet Standards** – **Simple Physical** – Bus , Ring and Star **Logical Topologies** **Hybrid Physical Topologies** – Star-Wired Ring Star-Wired Bus	Video about Comparison between different topologies+ assignment	**2**	PLO-1-K	K
8	– Backbone Networks – Serial Backbone – Distributed Backbone – Collapsed Backbone Parallel Backbone. .	Video about different types of backbone+ assignment	**5**	PLO6 -C2	C
Midterm Exam (30%)					
9	– **Switching** – Circuit Switching – Message Switching – Packet – MPLS (Multiprotocol Label Switching)	Video about switching node on the internet	**6**	PLO2-K	K
10	**Ethernet** – CSMA/CD (Carrier Sense Multiple Access with Collision Detection	Video about CSMA/CD	**5**	PLO-3	S
11	– Ethernet Standards for Copper Cable – Ethernet Standards for Fiber-Optic Cable	Video about various speed fiber cable	**5**	PLO-3	S

	10-Gigabit Fiber-Optic Standards				
12	Network layer Classes of IP address and the requirement for subnetting	Assignment about subnetting	**4**	PLO3-S1	S
13	**Routers.** – Router Characteristics and Functions	Video about Router configuration using simulator	**6**	PLO 5-C1	C
14	Routing Protocols	Assignment about routing functions	**6**	PLO 6-C2	C
15	**Projects Discussion**				
16	**Final Exam**				

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Lecture.
- flipped learning.
- learning through projects.
- learning through problem solving.
- participatory learning

Course Policies:

A- Attendance policies:
The maximum allowed absences is 15% of the lectures.
B- Absences from exams and handing in assignments on time:
Midterm exam can be retaken based on approval of excuse by the instructor's discretion.
Not handing assignment on time will incur penalties.
C- Academic Health and safety procedures
D- Honesty policy regarding cheating, plagiarism, and misbehaviour:
Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.
E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) 3**0%**
- Midterm 30**%**
- Final Exam **40 %**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required Equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the ZUJ E-Learning Platform at https://exams.zuj.edu.jo/
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools Implemented in the Course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs
- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching.
- Others…

Responsible Persons and their Signatures:

Course Coordinator	Prof . Mohammad Al Rawajbeh	**Completed Date**	**4/ 5 / 2025**
		Signature	
Received by (Department Head)		**Received Date**	/ /
		Signature	