The University of Jordan
School of Engineering
Department of Mechatronics Engineering
1st Semester – A.Y. 2025/2026

Course:	**Industrial Communications Systems & Networks** – 0908333 (3 Cr. – Core Course) **Lecture Time: Sun ,Tue and Thu 11:30 AM -12:30 PM**
Instructor:	Eng. Samer Z. Sartawi. *Office:* MX,. *Email*: samer.salah@ju.edu.jo *Office Hours:* Mon & Wed: 12:00 - 13:00 & Thu: 10:30 - 11:30.
Course Website:	**https://elearning.ju.edu.jo/**
Catalog Data:	network of networks, network protocols, network structure, network performance metrics. networking applications, transport layer protocols, the network layer, covering IP addressing, routing, and the structure of the Internet. Link layer technologies and protocols, including Ethernet and wireless communication, network security.
Prerequisites by Course:	Digital Logic – 0907231.
Prerequisites By Topic:	"The student should have the comprehensive understanding of digital systems, including binary number systems, logic gates, Boolean algebra, combinational and sequential logic circuits, digital circuit design, memory types.
Textbook: References:	Computer networking, James F. Kurose, Keith W. Ross, 8th Edition Lecture notes.
Schedule & Duration:	16 Weeks, 48 lectures (50 minutes each) including exams.
Minimum Student Material:	Textbook, class handouts, and scientific calculator.
Minimum College Facilities:	Classroom with whiteboard and projection display facilities, library.
Course Objectives:	To introduces the Internet's structure, the significance of protocols, and key performance metrics. To explores application layer protocols, client-server and peer-to-peer architectures, and the functioning of the Web and email systems. To focuses on transport layer protocols, particularly TCP and UDP, emphasizing reliable data transfer and flow control. To delves into the network layer, covering IP addressing, routing, and the Internet's architecture. To discusses the link layer's role in data transfer, including technologies like Ethernet and wireless communication. Finally, to highlights the importance of network security, addressing common threats and protective measures.

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should:

1. Understanding the Internet: Identify various components, including different types of networks (mobile, home, enterprise, ISPs), Describe the network edge and core.
2. Explain the concept of protocols in networking and Understand key performance metrics: loss, delay, and throughput.
3. Understanding Application Layer Protocols.

4. Understand the client-server and peer-peer architecture and its components.
5. Explain the function of DNS in translating domain names to IP addresses.
6. Discuss the requirements and challenges of multimedia applications (e.g., streaming video and audio).
7. Understand the principles of transport-layer services, including multiplexing, demultiplexing, flow control, and congestion control
8. Learn about the differences between TCP (connection-oriented, reliable transport) and UDP (connectionless, best-effort transport).
9. Explore principles of reliable data transfer, including error detection, retransmission, and acknowledgments.
10. Understand the role of the network layer in packet forwarding and routing.
11. Learn about IP addressing, sub netting, and network address translation (NAT).
12. Explore the internal structure of routers, including input ports, switching fabrics, and output scheduling.
13. Differentiate between traditional per-router control and software-defined networking (SDN).
14. Understand routing algorithms, including distance vector (Bellman-Ford) and link-state (Dijkstra's).
15. Understand link-layer services like error detection, error correction, and flow control and explore Ethernet, MAC addressing, VLANs, and ARP

ABET SO:

4) An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

Ground Rules:

- **Make up Examinations**

There will be no make up exams for any exam that will be taken during the course. exceptions to this rule is restricted only to the following cases:-

1. death of only first order relatives (father, mother, sister, or brother).
2. hospital entry (in-patient) during the time of the examination.

Any other cases will be given zero mark in the corresponding exam.

- **Special Notes**

Seating plan will be as given in the attendance sheet.

- **Attendance is required** and strictly enforced. To that end, attendance will be taken every lecture; Absence of more than *7 hours* will result in the expulsion of the student from the course.

Assessments:

Exams and quizzes.

Course topics:

1. Chapter 1: Computer Networks and the Internet.
2. Chapter 2: The Application Layer.
3. Chapter 3: The Transport Layer.
4. Chapter 4: The Network Layer: the Data Plane
5. Chapter 5: The Network Layer: the Control Plane
6. Chapter 6: The Link Layer.

Grading policy:

Professionalism +Quizzes		10 %
Project		10 **%**
Midterm Exam		30 **%**
Final Exam		50 **%**
	Total	**100%**

Last Updated:

Oct 2025