

	Ministry of Higher Education and Scientific Research - Iraq Al-Naji University College of Engineering Department of Cybersecurity Engineering	
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MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information					
معلومات المادة الدراسية					
Module Title	COMPUTER NETWORKS I			Module Delivery	
Module Type	CORE			☒ Theory ☐ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	CSE1204				
ECTS Credits	5				
SWL (hr/sem)	125				
Module Level	UG I		Semester of Delivery	2	
Administering Department	CSE		College	7294	
Module Leader	Huda Mohammed Akar		e-mail	huda.mohammed@alnaji-uni.edu.iq	
Module Leader's Acad. Title	Assist. Lecturer		Module Leader's Qualification	Msc	
Module Tutor	None		e-mail	None	
Peer Reviewer Name			e-mail		
Review Committee Approval	3/04/2025		Version Number	2.0	

Relation With Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None		Semester
Co-requisites module	None		Semester

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To understand the fundamental concepts of computer networks, including their applications, requirements, and architecture. 2. To gain knowledge of Ethernet and multiple access networks, including their physical properties, access protocols, frame formats, addresses, and transmitter algorithms. 3. To explore wireless networking technologies, including 802.11/WiFi, 802.15.1/Bluetooth, and cell-phone technologies. 4. To understand switching and bridging in network environments. 5. To acquire knowledge about basic internetworking with Internet Protocol (IP), including the service model, datagram delivery, packet format, and fragmentation and reassembly. 6. To learn about global addressing and classes in IP networks. 7. To develop skills in subnetting and classless addressing. 8. To gain practical experience through hands-on lab sessions, including configuring network components, building LANs, investigating network protocols using tools like Wireshark, and performing subnetting exercises using simulation software.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Demonstrate understanding of Ethernet and multiple access networks, including their physical properties, access protocols, frame formats, addresses, and transmitter algorithms. 2. Analyze and compare wireless networking technologies, including 802.11/WiFi, 802.15.1/Bluetooth, and cell-phone technologies. 3. Design and configure switching and bridging solutions in network environments. 4. Implement and troubleshoot basic internetworking with Internet Protocol (IP), including understanding the service model, ensuring datagram delivery, interpreting packet formats, and managing fragmentation and reassembly. 5. Demonstrate proficiency in subnetting and classless addressing techniques. 6. Apply theoretical knowledge in practical scenarios through hands-on lab sessions, including configuring network components, building LANs, analyzing network protocols using tools like Wireshark, and performing subnetting exercises using simulation software.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A: Introduction to Computer Networks (15 hours)

	Overview of computer networks and their applications Network requirements and architecture Layering and protocols Internet architecture Part B: Network Technologies (16 hours) Ethernet and multiple access networks Wireless networking technologies Switching and bridging Basic internetworking with Internet Protocol (IP) Part C: IP Addressing and Subnetting (20 hours) Global addressing and classful addressing in IP networks Subnetting techniques and classless addressing Practical exercises on subnetting using simulation software
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy employed in delivering the CONT I module is to foster active student participation and enhance critical thinking skills. This will be achieved through interactive classes, practical experiments, group work, and discussions. By encouraging students to actively engage with the course material, ask questions, and participate in problem-solving activities, they will develop a deeper understanding of computer networks. The inclusion of critical thinking exercises and the utilization of multimedia resources further enhance the learning experience. Through these strategies, students will not only gain theoretical knowledge but also can apply it in real-world scenarios, refining their critical thinking abilities and fostering a collaborative learning environment.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	77	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	48	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	9	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Network Medium, Network Devices, Network Topologies.
Week 2	Defining service, protocol, network edge, network core – packet and circuit switching
Week 3	Layered architecture and encapsulation
Week 4	Principles of Network Applications, The Web and HTTP protocol, Web caching
Week 5	Electronic Mail in the Internet, SMTP, Mail Message Formats, Mail Access Protocols
Week 6	Midterm Exam 1
Week 7	DNS—The Internet’s Directory Service, Services Provided by DNS, Overview of How DNS Works, DNS Records and Messages,
Week 8	Video Streaming and Content Distribution Networks, HTTP Streaming and DASH, Content Distribution Networks, Case Studies: Netflix and YouTube
Week 9-10	Introduction and Transport-Layer Services, Relationship Between Transport and Network Layers, Connectionless Transport: UDP, Principles of Reliable Data Transfer,
Week 11-12	Connection-Oriented Transport: TCP, Principles of Congestion Control, TCP Congestion Control
Week 13-14	Overview of Network Layer, What’s Inside a Router?, Forwarding and Routing: The Data and Control Planes, Network Service Model,
Week 15	Input Port Processing and Destination-Based Forwarding, Switching, Output Port Processing, Where Does Queuing Occur?, Packet Scheduling
Week 16	Final Exam.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
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Week 1	Introducing Lab reports, requirements, and manual
Week 2	Explaining required network simulators: OPNET and Packet Tracer
Week 3	Explaining required network packet analyzer: Wireshark
Week 4	Implementing a network with WEB Service
Week 5	Implementing a Network with DNS service
Week 6	Exam1
Week 7	Exploring UDP segments
Week 8	Exploring TCP segments
Week 9	Implementing DHCP, IPv4 addressing with VLSM
Week 10	Implementing static and dynamic NAT
Week 11	Explaining Mininet emulator
Week 12	Exam2
Week 13	Configuring and operating dynamic routing with RIP
Week 14	Configuring and operating dynamic routing with OSPF
Week 15	A simple network emulation using Mininet

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	James F. Kurose and Keith W. Ross , Computer Networking: A Top-Down Approach , 8th edition	Yes
Recommended Texts	Richard M. Roberts and Chuck Easttom, Networking Fundamentals, 3rd edition, The Goodheart-Willcox Co., 2020	Yes
Websites	https://mdl.coie-nahrain.edu.iq	

APPENDIX:

GRADING SCHEME

مخطط الدرجات

Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:				
NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.				

