MODULE DESCRIPTION FORM

Module Information

Module Title	**Computer Networks**	**Module Delivery**	
Module Type	**Core**	☒ **Lecture** ☒ **Practical**	
Module Code	**IT2101**		
ECTS Credits	**6**		
SWL (hr/sem)	**150**		
Module Level	UG2	**Semester of Delivery**	1
Administering Department	Information Technology	**College**	College of Science
Module Leader	**Karar Sadiq Mohsin**	**e-mail**	karar.sadeq@uowa.edu.iq
Module Leader's Acad. Title	Asst. Lecturer	**Module Leader's Qualification**	MS.c
Module Tutor	Ali Abdul Hussein Ibrahim	**e-mail**	ali.abdulhussein19@uowa.edu.iq
Peer Reviewer Name	Asst . Lect Nabeel Sadeq	**e-mail**	nabeel.alshreefy@uowa.edu.iq
Scientific Committee Approval Date	2025-09-1	**Version Number**	V01

Relation with other Modules

Prerequisite module	None	**Semester**	None
Co-requisites module	None	**Semester**	None

جامعة وارث الانبياء
كلية العلوم
قسم تكنولوجيا المعلومات

جامعة وارث الانبياء
عمادة كلية العلوم

Department Head Approval

Dean of the College Approval

Module Aims, Learning Outcomes and Indicative Contents	
Module Aims	The "Computer Networks" module aims to provide IT undergraduate students with a solid foundation in computer networks. The module starts with an introduction to networks and progressively delves into the application and transport layers. Through a combination of theoretical knowledge and practical applications, the module aims to enable students to comprehend the principles, protocols, and functionalities of computer networks. By the end of the module, students should be capable of analyzing network requirements, designing appropriate solutions, implementing network services, and diagnosing common issues at the application and transport layers. Furthermore, the module aims to foster critical thinking, problem-solving skills, and an understanding of best practices for securing computer networks. Ultimately, the module seeks to prepare students for professional roles in network administration, network engineering, and related fields by equipping them with the necessary knowledge and skills in computer networks.
Module Learning Outcomes	Understand the fundamental concepts and principles of computer networks. Analyze and explain the functionalities and protocols of the application and transport layers. Evaluate network requirements and design appropriate solutions for different scenarios. Implement and configure network services and protocols at the application and transport layers. Diagnose and troubleshoot common network issues at the application and transport layers. Apply best practices for securing computer networks at the application and transport layers.
Indicative Contents	Introduction to Networks Overview of computer networks and their importance in modern IT infrastructure. Network topologies, protocols, and standards. Network architectures: client-server, peer-to-peer, hybrid. Network components: routers, switches, hubs, and cables. Application Layer Overview of the application layer and its role in network communication. Common application layer protocols: HTTP, FTP, DNS, SMTP. Application layer services: email, web browsing, file transfer. Socket programming and network application development. Transport Layer Overview of the transport layer and its role in reliable data delivery. Transport layer protocols: TCP and UDP. Flow control, congestion control, and error detection techniques. Quality of Service (QoS) considerations at the transport layer.

Learning and Teaching Strategies	
Strategies	Lectures: In-class lectures will be delivered to introduce and explain key concepts, theories, and principles related to computer networks. Lectures will include real-world examples and case studies to enhance understanding. Practical Sessions: Practical sessions will provide hands-on experience in configuring and managing computer networks. Students will have the opportunity to work with networking tools, simulate network scenarios, and troubleshoot network issues. Group Discussions: Group discussions will encourage students to critically analyze and discuss networking concepts, protocols, and design principles. This will foster collaborative learning and the exchange of ideas among peers. Case Studies and Projects: Students will be assigned case studies and projects that require them to apply their knowledge and skills to real-world network scenarios. This will help them develop problem-solving abilities and reinforce their understanding of network concepts. Independent Study: Students will be expected to engage in independent study to further explore and deepen their understanding of the module content. This may involve reading recommended textbooks, researching additional resources, and completing assigned exercises. Assessments: Assessments will include individual and group assignments, practical exercises, quizzes, and examinations. These assessments will evaluate students' understanding of concepts, ability to apply knowledge, and skills in network analysis and troubleshooting.

Student Workload (SWL)			
Structured SWL (h/sem)	60	**Structured SWL (h/w)**	4
Unstructured SWL (h/sem)	87	**Unstructured SWL (h/w)**	6
Total SWL (h/sem)	147 + 3 final = 150		

Module Evaluation

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	**Quizzes**	8	10% (8)	2,4,6,8,10	1,2,3,4
	Home Work	5	10% (7)	Continues	3,5,7,9,11
	Projects	1	10% (5)	9	1,2,3,4,5,6,7
	Lab	5	10%(15)	Continues	1,2,3,4,5,6,7
	Onsite Assignmnets	5	10% (5)	1,2,3,4,5,6,8,9, 10,11,12,13,14, 15	3,5,7,9,11
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	
	Final Exam	3hr	50% (50)	16	
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

	Material Covered
Week 1	Introduction to Networks
Week 2	Network Core: Packet and Circuit Switching
Week 3	Delay, Loss, Throughput in Networks
Week 4	Protocol Layers and Service Model
Week 5	Principles of Network Applications
Week 6	Web and HTTP FTP
Week 7	Electronic Mail: SMTP, POP3, IMAP
Week 8	DNS and P2P
Week 9	Transport Layer: Services
Week 10	Multiplexing and Demultiplexing
Week 11	Reliable Data Transfer RDT
Week 12	Connectionless Transport Protocol: UDP
Week 13	Connection-oriented transport: TCP
Week 14	TCP Congestion Control

Week 15	Flow Control
Week 16	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus)	
	Material Covered
Week 1	Introduction to Network Components and Configurations
Week 2	Analyzing Network Topologies
Week 3	Configuring and Testing Network Protocols
Week 4	Socket Programming
Week 5	HTTP and FTP
Week 6	Flow Control and Congestion Control
Week 7	Quality of Service (QoS) Configuration
Week 8	Network Security and Firewalls
Week 9	Virtual Private Networks (VPNs)
Week 10	Network Monitoring and Troubleshooting
Week 11	SMTP, IMAP and POP3
Week 12	Network Address Translation (NAT)
Week 13	DNS Configuration and Domain Setup
Week 14	Network Virtualization
Week 15	Network Performance Testing and Optimization

Learning and Teaching Resources		
	Text	**Available in the Library?**
Required Texts	L. L. Peterson and B. S. Davie. Computer Networks, A Systems Approach. Morgan Kaufman, Fourth edition, 2006. • A. S. Tanenbaum. Computer networks. Prentice-Hall, Fifth	Yes

	edition, 2010	
Recommended Texts	• James F. Kurose and KeithW. Ross. Computer Networking: A Top-Down Approach, Eighth edition, 2020	No
Websites	Jim Kurose Homepage (umass.edu)	

Grading Scheme				
Group	**Grade**	Mark	**Marks (%)**	**Definition**
Success Group (50 - 100)	**A -** Excellent	Excellent	90 - 100	Outstanding Performance
	B - Very Good	Very Good	80 - 89	Above average with some errors
	C - Good	Good	70 - 79	Sound work with notable errors
	D - Satisfactory	Fair / Average	60 - 69	Fair but with major shortcomings
	E - Sufficient	Pass / Acceptable	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	**FX –** Fail	Fail (Pending)	(45-49)	More work required but credit awarded
	F – Fail	Fail	(0-44)	Considerable amount of work required

Note: Marks 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.