MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Computer Networks Protocols**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** ☒ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**CET4102**				
ECTS Credits	**6**				
SWL (hr/sem)	**180**				
Module Level	4		**Semester of Delivery**	7	
Administering Department	CET		**College**	EETC	
Module Leader	Mohamed Ibrahim .Shujaa		**e-mail**	drshujaa@mtu.edu.iq	
Module Leader's Acad. Title	Assist. Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Ammar Alauldeen Abdulmajeed		**e-mail**	Ammar.all@mtu.edu.iq	
Peer Reviewer Name	Dr. Mahmoud Shuker Mahmoud		**e-mail**	mahmoud.shukur@mtu.edu.iq	
Scientific Committee Approval Date	13/06/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Computer Network fundamental	**Semester**	6
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. Prepare network engineers who can prepare and design all types of networks. 2. This course teaches modern and advanced curricula in the field of computer networks. 3. Providing high-quality modern research that can be applied in the field of computer networks and the Internet. 4. Provides appropriate solutions to the problems of design and installation of networks and choose the best protocols.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enable the students to apply their knowledge and skills in the field of computer networks to find practical solutions to any problems in this field and to be able to make appropriate decisions in the field of work. 2. Summarize the OSI model with all functions and objectives. 3. Discuss the protocols of each layer and its function and work. 4. Describe the network algorithms in the entire OSI model. 5. Describe the errors in networking communication. 6. Identify the solution for routing and forwarding in the network. 7. Discuss the explain the security of the network. 8. Discuss the protocols that deal with routing and security. 9. Explain the TCP/IP model and its relationship with the OSI model 10. Analyze, discuss, and use Network test results in the design and evaluation topology processes.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Part A – OSI Network Model Layering model. functions of each layer, Services, general view of each protocol in each layer, and functions of each protocol regarding each layer. [15 hrs] Physical layer and transmission, Data link layer and Errors, Algorithms of data link layers. [15 hrs] The network layer of the OSI model, Function and services, Routing Algorithm, protocol algorithm, and application, network failure and delay, [15 hrs] Error's function, Network failure, and solutions. [10 hrs]

	Revision problem classes [6 hrs] Part B – Protocols of OSI model Protocol of each layer in details, function and services, experimental application [15 hrs] Switching routing. Components and experimental switching and algorithms. [7 hrs] The transport layer, functions protocols, protocols application, and flow experiment. [5 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the simulation experiment, and tutorial lectures while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials, and by considering types of simple experiments involving networking activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	88	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	92	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	180		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1-3, LO #3-7
	Assignments	2	10% (10)	2, 12	LO # 1-8
	Projects / Lab.	1	10% (10)	Continuous	
Summative assessment	**Midterm Exam**	2 hr	20% (20)	7	LO # 1-4
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Protocol Hierarchies in OSI model: (Application layer, presentation layer, session layer, transport layer, network layer, datalink layer. Physical layer) basics. PDU
Week 2	Physical Layer Protocols, Protocol Design Issues, Transmission, and Multiplexing Protocol Functionality, Layering, and Framework (SP3)
Week 3	Link layer: Services Provided by the Link Layer, Multiple Access Links and HDLC Protocols, Taking-turns protocols,
Week 4	Link layer Error control and flow control algorithms MAC Protocols (Ethernet, DSL, ISDN, FDDI) ; CSMA/CD
Week 5	**Link layer:** Types of errors, Checksum algorithms CRC, MAC, Switch, ARP, L2TP, PPP **Network Layer** Protocols, Concepts, and Routing Algorithms.
Week 6	**Network Layer Protocols -** OSPF routing, EIGRP routing Rip, BGP, ICMP, DHCP
Week 7	Network Protocols: RIP, BGP, ICMP, DHCP
Week 8	**Network layer components** Routing Algorithms (LS, DV)
Week 9	IP (Internet Protocol), IP Datagram Fragmentation IPv4, IPv6, IPsec
Week 10	Transport Layer Protocols Design Congestion Control, Flow Control- Services
Week 11	MUX, DMUX, Connectionless, Connection Oriented. TCP/UDP Analysis and Implementation
Week 12	**Presentation Protocols:** Security Protocols (SSL, SSH)
Week 13	Application Layer Protocols (Architecture, services)
Week 14	Protocols: WWW (HTTP, HTTPs, FTP, DHCP,)
Week 15	**TCP/ IP Model & Protocols Stack** Electronic Mail Protocols (SMTP, POP) DNS, Telnet protocols
Week 16	**A preparatory week before the Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to Cisco packet tracer and configuration Review
Week 2	Lab 2: VLAN network
Week 3	Lab 3: Inter-VLAN Techniques
Week 4	Lab 4: Static Routing Protocol
Week 5	Lab 5: Dynamic Routing Protocol (RIP)
Week 6	Lab 6: Dynamic Routing Protocol (RIP)
Week 7	Lab 7: DHCP,
Week 8	Lab 8: HTTP,DNS Protocol
Week 9	Lab 9: IPv6
Week 10	Lab 10: Router and Switch Security

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	: **Computer Networking A Top Down Approach.** **Author :** James F. Kurose, Keith W. ross **Edition/Publisher/year :** 6th ,7th edition /Pearson 2013,2018	Yes
Recommended Texts	Internetworking with TCP/IP Author : Douglas E. corner	No
Websites	https://www.coursera.org/browse/physical-science-and-engineering/	

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	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(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.