

جامعة الزيتونية الأردنية Al-Zaytoonah University of Jordan كلية العلوم وتكنولوجيا المعلومات Faculty of Science and IT



" عراقة وجودة" "Tradition and Quality"

QF01/0408-4.0E Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Cyber Security Department

Study plan No.	2022/2021		University Specialization		Cyber securi	ity
Course No.	0125245		Course name		Computer no	etwork(2)
Credit Hours	3		Prerequisite/ Co-requisite		Computer no	etwork(1)
Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	☐ Support course family requirements	√Mandator y requirement s	☐ Elective requirements
Teaching style	☐ Full online learning		√Blended lear	rning	☐ Traditional l	earning
Teaching model	☐ 1 Synchronous: 1 asynchronous		√1 face to face asynchronous	: 1	□ 2 Tradition	al

Faculty member and study divisions' information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E	-mail
Zeyad	Associate	336		Z.Dose	ooq@zuj.edu.jo
Mohammad	professor				
Division number	Time	Place	Number of students	Teaching style	Approved model
2	12:30	250	16	Blended	1 face to face
				learning	:1
					asynchronous

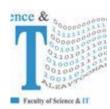
Brief description

This module is the second level module of curricula related to the computer networks field. It provides in depth coverage of some basic topics in routing algorithms and IP addressing. It covers essential Network protocols: ARP, IP, subnetting and supernetting, ICMP, IGMP, UDP, TCP, routing protocols such as default route, static route, RIPv1, RIPv2, IGRP, EIGRP and OSPF, application protocols such as DNS, DHCP, FTP, HTTP, SNMP, NAT, and PAT. The student should be able to learn doing the following configuration

- 1- Build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.
- 2- Configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, and single-area of OSPF.
- 3- Configure and troubleshoot routers and switches and resolve common issues with OSPF, and EIGRP.

Learning resources

Course book information	WENDELL ODOM, CCNA 200-301, Volume 1 Official Cert Guide, Cisco Press, 2020.
(Title, author, date of issue,	
publisher etc)	
Supportive learning resources	1- Todd Lammle, CCNA Routing and Switching Study Guide, Sybex, 2013.
(Books, databases,	2- Glen E. Clarke, CompTIA Network+ certification study guide, Seventh edition,
periodicals, software,	McGraw-Hill Education, 2018.



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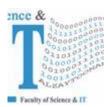
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applications, others) Supporting websites		3- James F. Kurose and Keith W. Ross, COMPUTER NETWORKING: A Top-Down Approach, Eighth edition, Pearson, 2020.			
The physical environment for teaching		☐ Class room	√labs	☐ Virtual educational platform	☐ Others
Necessary equipment and software		Packet tracer and	wireshark		
Supporting people with special needs					
For technical support					

Course learning outcomes (S = Skills, C= Competences K= Knowledge,)

No.	Course learning outcomes	The associated program learning output code
	Knowledge	
K1	Understanding TCP/IP model and its protocols	MK3
K2	Describing ISO/OSI model	MK3
К3	Understanding IPv4 and IPv6 addressing and their subnetting and supernetting	MK3
K4	Understanding IP Routing Technologies and dynamic routing protocols	MK3
K5	Describing ICMP and SNMP protocols	MK3
	Skills	
S1	Calculate, and apply subnet masks and addresses to fulfill given requirements in IPv4 and IPv6 networks	MS2
S2	Design a network to fulfill given requirements for solving a specific networking problem.	MS2
S3	Configure and troubleshoot static routing and default routing	MS2
S4	Configure and troubleshoot routers in a complex routed IPv4 network using dynamic routing protocols (RIP, IGRP, EIGRP and OSPF)	MS2
	Competences	
C1	Make judgments with regards to relevant scientific, societal, and ethical aspects, and test & decide with the working team whether a given routing protocol is suitable for a given network design or not.	MC2

Mechanisms for direct evaluation of learning outcomes

Type of assessment / learning style	Fully electronic learning	Blended learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm exam	30%	30%	40%	30%
Participation / practical applications	0	0	10%	30%



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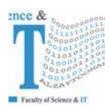
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Asynchronous interactive activities	30%	30%	0	0	
Final exam	40%	40%	50%	40%	

Note 1: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Note 2: According to the Regulations of granting Master's degree at Al-Zaytoonah University of Jordan, 40% of final evaluation goes for the final exam, and 60% for the semester work (examinations, reports, research or any scientific activity assigned to the student).

Schedule of simultaneous / face-to-face encounters and their topics

Week	Subject	learning style*	Reference **
2 3	Introduction to TCP/IP networking - TCP/IP protocol family - What is an internet? - ISO/OSI Network Model - TCP/IP Network Model - Packet encapsulation - IP addresses and allocation of addresses Introduction to TCP/IP networking - IP packets and datagram - IP Routing - UDP datagram and its applications Introduction to TCP/IP networking - TCP and its applications - TCP packets and its	Lecture and practice by using wireshark Lecture and practice by using wireshark	Ref(1) 87-130 and internet resources Ref(1) 87-130, Ref(2) 310- 333 and internet resources
	implementation - TCP Segment and its hand shake - Ethernet and ARP - DHCP		
4	IPv4 addressing - Perspectives on IPv4 Subnetting	Lecture	264-287
5	Analyzing Classful IPv4 Networks	Lecture	288-298
6	Analyzing Subnet Masks	Lecture and calculating subnet of Class A, B, and C	302-315, Ref(1) 139-174
7	Analyzing Existing Subnets Summarization	Lecture and calculating and	320-339, Ref(1) 181-206



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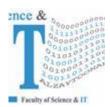
		designing subnet and summarizing of Class A, B, and C	
8	Fundamentals of IP Version 6	lecture	522-536
9	IPv6 Addressing and Subnetting	lecture	540-553
10	NAT/PAT/SNAT and DNS	Lecture and practice by using wireshark	Ref(2) 343-346, Ref(2) 287-301
11	ICMP and SNMP	Lecture and practice by using wireshark	Ref(3) 423-436
12	Routing and SDN Configuring IPv4 Addresses and Static Routes	Lecture and configure and implement of default and static route	Ref(3) 377-419 366-390
13	RIP, IGRP and EIGRP protocols and their configurations and implementations	Lecture and configure and implement of RIP, EIGRP routing protocols	Ref(1) 331-380, Ref(1) 783-838
14	Understanding OSPF Concepts Implementing OSPF	Lecture and configure and implement of OSPF	440-494
15	OSPF Network Types and Neighbors Review	configure and implement of OSPF	498-516
16	Final Exam	_	

^{*} Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.

Schedule of asynchronous interactive activities (in the case of e-learning and blended learning)

Week	Task / activity	Reference	Expected results
1	Fill in blanks, drag the words	Lectures 1 and 2	Understanding TCP/IP
			concepts and
			understanding TCP/IP
			applications
2	Fill in blanks, drag the words	Lectures 3 and 4	Understanding DHCP,
			ethernet and TCP
			handshake
3	Fill in blanks, drag the words	Lectures 5 and 6	Understanding IP
			addressing
4	Fill in blanks, drag the words	Lectures 7 and 8	Understanding
			subnetting and
			supernetting
5	Assignment	Lecture 9 and 10	Practice subnetting
			class A
6	Assignment	Lecture 11 and 12	Practice subnetting

^{**} Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.



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			class B
7	Assignment	Lecture 13 and 14	Practice subnetting class C
8	Fill in blanks, drag the words	Lecture 15 and 16	Understanding IPv6 and its subnetting
9	Assignment	Lecture 17 and 18	Understanding NAT and DNS
10	Fill in blanks, drag the words	Lecture 19 and 20	Understanding ICMP and SNMP
11	Assignment	Lecture 21 and 22	Understand IP routing
12	Assignment	Lecture 23 and 24	Configure and implement static route and default route
13	Assignment	Lecture 25 and 25	Configure and implement RIP and EIGRP
14	Assignment	Lecture 25 and 25	Configure and implement OSPF
15	Discussion forum	Review lectures	Review final exam materials
16	Final exam		