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 security**		
Course No.	**0125245**		**Course name**		**Computer network(2)**		
Credit Hours	**3**		**Prerequisite/ Co-requisite**		**Computer network(1)**		
Course type	☐ MANDATORY UNIVERSITY REQUIREMENT	☐ UNIVERSITY ELECTIVE REQUIREMENTS	☐ FACULTY MANDATORY REQUIREMENT	☐ Support course family requirements	√Mandatory requirements	☐ Elective requirements	
Teaching style	☐ Full online learning		√Blended learning		☐ Traditional learning		
Teaching model	☐ 1 Synchronous: 1 asynchronous		√1 face to face : 1 asynchronous		☐ 2 Traditional		

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 Mohammad	Associate professor	336		Z.Dosooq@zuj.edu.jo	
Division number	**Time**	**Place**	**Number of students**	**Teaching style**	**Approved model**
2	12:30	250	16	Blended learning	1 face to face : 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 (Title, author, date of issue, publisher ... etc)	WENDELL ODOM, CCNA 200-301, Volume 1 Official Cert Guide, Cisco Press, 2020.
Supportive learning resources (Books, databases, periodicals, software,	1- Todd Lammle, CCNA Routing and Switching Study Guide, Sybex, 2013. 2- Glen E. Clarke, CompTIA Network+ certification study guide, Seventh edition, McGraw-Hill Education, 2018.

applications, others)	3- James F. Kurose and Keith W. Ross, COMPUTER NETWORKING: A Top-Down Approach, Eighth edition, Pearson, 2020.			
Supporting websites				
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**
K3	**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%

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 **
1	**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**	**Lecture**	**12-30**
2	**Introduction to TCP/IP networking** - **IP packets and datagram** - **IP Routing** - **UDP datagram and its applications**	**Lecture and practice by using wireshark**	**Ref(1) 87-130 and internet resources**
3	**Introduction to TCP/IP networking** - **TCP and its applications** - **TCP packets and its implementation** - **TCP Segment and its hand shake** - **Ethernet and ARP** - **DHCP**	**Lecture and practice by using wireshark**	**Ref(1) 87-130, Ref(2) 310- 333 and internet resources**
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**

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

			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		