جامعة الزيتونة الأردنية

Al-Zaytoonah University of Jordan

Course Syllabus

According to JORDAN National Qualification Framework (JNQF)

Course Name: Data Communications and Security

Course Number: 0130317

General Course Information:

Course Title	Data Communications and Security
Course Number	0130317
Credit Hours	3 credit hours
Education Type	Blended learning
Prerequisites/Co-requisites	Computer Networks (0130214)
Academic Program	Computer Science
Program Code	130
Faculty	Faculty of Science and Information Technology
Department	Computer Science
Level of Course	3
Academic Year /Semester	2024/2025 Second Semester
Awarded Qualification	BS'c
Other Department(s) Involved in Teaching the Course	-
Language of Instruction	English
Date of Production/Revision	2024-2025

Course Coordinator:

Coordinator's Name	Dr. Khalid Farhan
Office No.	9211
Office Phone Extension Number	N/A
Office Hours	12:30 to 14:00 (Sunday, Monday and Tuesday)
E-mail	08:00 to 9:30 (Wednesday)

Other Instructors:

Instructor Name	
Office No.	
Office Phone Extension Number	
Office Hours	
Email	

Course Description *(English/Arabic)*:

English	*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.*
Arabic	*هذ المساق هو المستوى الثاني من مناهج شبكات الحاسوب. يغطي هذا المساق بشكل مُعمّق بعض المواضيع الأساسية في خوارزميات التوجيه وعناوين IP. كما يغطي بروتوكولات الشبكات الأساسية: ARP، IP، تقسيم الشبكات الفرعية والشبكات الفائقة، ICMP، IGMP، UDP، TCP، وبروتوكولات التوجيه مثل المسار الافتراضي والمسار الثابت، RIPv1، RIPv2، IGRP، EIGRP، و OSPF، وبروتوكولات التطبيقات مثل DNS، DHCP، FTP، HTTP، SNMP، NAT، و PAT .*

Textbook: *Author(s), Title, Publisher, Edition, Year, Book website.*

WENDELL ODOM, CCNA 200-301, Volume 1 Official Cert Guide, Cisco Press, 2022.

References: *Author(s), Title, Publisher, Edition, Year, Book website.*

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.**

Course Educational Objectives (CEOs):

1.	**Develop a strong foundation about complex and efficient network architectures.**
2.	Explore the deploying IPv4 and IPv6 in a network environment
3.	Gain a practical experience about routing and switching protocols
4.	Gain experience about subnetting

Intended Learning Outcomes (ILO's):

Intended learning outcomes (ILOs)		Relationship to CEOs	Contribution to PLOs	Bloom Taxonomy Levels*	JNQF Descriptors**
	K- Knowledge and Understanding				
K1	Understanding TCP/IP model and its protocols	CEO 1	PLO1-K	Remembering	K
K2	Understanding IP Routing Technologies and dynamic routing protocols	CEO 3	PLO2-K	Understanding	K
	S- Intellectual skills				
S1	Configure and troubleshoot static routing and default routing	CEO 3	PLO 3-S	Applying	S
S2	Understanding IPv4 and IPv6 addressing and their subnetting and supernetting	CEO 4	PLO4-S	Applying	S
	C- Competencies				
C1	Understanding and troubleshoot routers in a complex routed IPv4 network using routing protocols (RIP, IGRP, EIGRP and OSPF)	CEO 2	PLO6-C	Understanding	C
	D- Transferable skills				
D1					

*Bloom Taxonomy Levels:

Level #	1	2	3	4	5	6
Level Name	Remembering	Understanding	Applying	Analyzing	Evaluating	Creating

** Descriptor (National Qualification Framework Descriptors): K: Knowledge, S: Skill, C: Competency.

Program Learning Outcome (PLOs):

(PLOs)		JNQF Descriptors**		
		K	S	C
PLO1-K	Knowledge of professional ethics, social responsibility, and the regulations governing them.	√		
PLO2-K	Understanding various programming techniques, the stages of software development, and the fundamental principles of security.	√		
PLO3-S	Skill in applying mathematical concepts to analyze and design algorithms and verify their correctness		√	
PLO4-S	Skill in using different programming languages and applying them to develop software and computer applications.		√	
PLO5-C	The ability to analyze, design, and develop effective and reliable computer programs that meet user requirements and adhere to professional ethics.			√
PLO6-C	The ability to keep up with continuous advancements in computer science, innovate, and work independently or as part of a team.			√
PLO7-D	The ability to work collaboratively, communicate effectively, and demonstrate teamwork spirit.		√	

**** Descriptors according to the national qualifications framework (K: knowledge, S: skill, C: Competency)**

Weekly Schedule *(please choose the type of teaching)*

- ☐ **Face to Face (F2F)**
- ☒ **Hybrid** *(One – To - One)*
- ☐ **Online**

Schedule of Simultaneous and their Topics:

Week	First Lecture (F2F)	Second Lecture (F2F)	ILOs	PLOs	JNQF Descriptors*
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**	Video about TCP/IP reference model	**K1**	**1**	**K**
2	**Introduction to TCP/IP networking** - **IP packets and datagram** - **IP Routing** **UDP datagram**	Practical lab using wiresharke to analyse the packets structure	**K2**	**2**	**K**

	and its applications				
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**	Assignment to explain the concept of three way handshake	**K2**	**2**	**K**
4	**IPv4 addressing** **- Perspectives on IPv4** **Subnetting**	Assignment about subnetting	**S1**	**3**	**S**
5	**Analyzing Classful IPv4 Networks**	Video about different IP classes and its usage	**S1**	**3**	**S**
6	**Analyzing Subnet Masks**	Practical lab for NIC configuration	**S2**	**4, 6**	**S , C**
7	**Analyzing Existing Subnets Summarization**	Assignment about subnetting	**S1**	**3, 6**	**S ,C**
Midterm Exam (30%)					
9	**Fundamentals of IP Version 6**	Assignment about IPv4 running out problem	**K2**	**2**	**K**
10	**IPv6 Addressing and Subnetting**	Assignment about subnetting	**K1**	**2, 6**	**K , C**
11	**NAT/PAT/SNAT and DNS**	Practical lab for NAT configuration	**K1**	**2**	**K**
12	**ICMP and SNMP**	Practical lab for SNMP configuration	**K2**	**2**	**K**
13	**Routing and SDN** **Configuring IPv4 Addresses and Static Routes**	Practical lab for routing protocols configuration	**S1**	**4, 6**	**S , C**

14		using packet tracer			
15	**RIP, IGRP and EIGRP protocols and their configurations and implementations**	Practical lab for routing protocols configuration using packet tracer	**S2**	**3, 6**	**S, C**
16	**Final Exam**				

* **K: Knowledge, S: Skills, C: Competency**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Lecture.
- flipped learning.
- learning through projects.
- learning through problem solving.
- participatory learning

Course Policies:

A- Attendance policies:
The maximum allowed absences is 15% of the lectures.
B- Absences from exams and handing in assignments on time:
Midterm exam can be retaken based on approval of excuse by the instructor's discretion.
Not handing assignment on time will incur penalties.
C- Academic Health and safety procedures
D- Honesty policy regarding cheating, plagiarism, and misbehaviour:
Cheating, plagiarism, misbehaviour will result in zero grade and further disciplinary actions may be taken.
E- Grading policy:

- All homework is to be posted online through the e-learning system.
- Exams will be marked within 72 hours and the marked exam papers will be handed to the students.
- Online Activities (Course Videos, Practice labs, Discussion Forums, Quizzes) 3**0%**
- Midterm 30**%**
- Final Exam 40**%**

F- Available university services that support achievement in the course: **E-Learning Platform, Labs, Library.**

Required Equipment:

- PC / Laptop with webcam and mic
- Internet Connection
- Access to the ZUJ E-Learning Platform at https://exams.zuj.edu.jo/
- E-learning plan
- Satisfaction questionnaires for online and face-to-face learning
- Software for e-learning
- Training

Assessment Tools Implemented in the Course:

- Final Exam
- Midterm Exam
- Quizzes
- Homework
- Practice Labs

- Discussion Forums
- Periodic reports for learning assessment
- Improvement plans for online or face-to-face teaching.
- Others…

Responsible Persons and their Signatures:

Course Coordinator	Dr. Khalid Farhan	**Completed Date**	**2/ 5** / 2025
		Signature	
Received by (Department Head)		**Received Date**	**3/ 5 /2025**
		Signature	