



**College of Information Technology
Department of Information Technology
COURSE SYLLABUS/ SPECIFICATION**

Course Code & Title: ITCS 335 - IT Infrastructure

Weight: (2 – 2 – 3)

Prerequisite: ITCS 214

NQF Level Allocated: 7

NQF Notional Hours / Credits: 120 notional hours/ 12 NQF credit

Description:

This course provides the fundamental networking skills required to deploy and support Network Operating System (NOS) in most organizations. It covers IP fundamentals, remote access technologies, and more advanced content including Software Defined Networking. This course is intended for existing IT professionals who have some networking knowledge and experience and are looking for a single course that provides insight into core and advanced networking technologies in NOS.

Objectives:

1. To critically understand, plan and implement IPv4 network, DHCP, IPv6, DNS, IPAM, Direct Access and VPN.
2. To gain expertise in implementing networking for branch offices, Software Defined Networking, network virtualization, and Network Controller.
3. To be competent in planning networks and remote access.
4. To develop the skills to configure advanced networking features, and advanced Microsoft Hyper-V networking features
5. To help students gain experience of working as a member of a networking team.

Semester:

Instructor(s):

Office Telephone:

Email (s):

Intended Learning Outcomes (ILOs):

A. Knowledge and Understanding		NQF Descriptor/ Level
A1	Concepts and Theories: Recognize advanced concepts and principles related to IT infrastructure solution, such as clients, servers, network devices, wired and wireless network.	Knowledge: theoretical understanding [Level 7]
A2	Contemporary Trends, Problems and Research: N/A	N/A
A3	Professional Responsibility: N/A	N/A
B. Subject-specific Skills		NQF Descriptor/ Level
B1	Problem Solving: Use advanced level skills to evaluate and select an integrated IT infrastructure (hardware, software, architectures, and services) to best fulfill a real life organizational requirements	Knowledge: Practical Application [Level 7]
B2	Modeling and Design: N/A	N/A
B3	Application of Methods and Tools: Apply advanced tools and techniques to plan and implement a computer network.	Knowledge: Practical Application [Level 7]
C. Critical-Thinking Skills		NQF Descriptor/ Level
C1	Analytic skills: Analyze an existing IT infrastructure, identify its strengths and weaknesses, and develop a roadmap for future evolution.	Generic Problem Solving & Analytical skills [Level 7]
C2	Synthetic: Identify and diagnose basic computer communication problems and to develop the necessary strategies to work towards their resolution	Generic Problem Solving & Analytical skills [Level 7]
C3	Creative Thinking and innovation: N/A	N/A
D. General and Transferable Skills (other skills relevant to employability and personal development)		NQF Descriptor/ Level
D1	Communication:	N/A
D2	Teamwork and Leadership: Operate an advanced level and work collaboratively in a team to complete a task.	Competence: Autonomy, Responsibility and Context

		[Level 7]
D3	Organizational and Developmental Skills: Demonstrate accountability to organize ideas and effectively allocate time in given assignment or project	Competence: Autonomy, Responsibility and Context [Level 7]
D4	Ethics and Social Responsibility: N/A	N/A

Course Structure (Outline)

Week	Hours Lect. - Lab	ILOs	Topics	Teaching Method	Assessment Method
1	4 - 0	A1	Introduction to computer networks, the definition of IT infrastructure and IP addressing basics.	Lecture/ In-Class Supervised Work	In-Class Exercises
2	2 - 2	B1, B3	Planning IPv4 network, Configuring an IPv4 host, Managing and troubleshooting IPv4 network connectivity	Lecture/ In-Lab Supervised Work	In-Lab Exercises
3	2 - 2	B1, B3, C1, C2, D2, D3	Planning the IPv4 address assignments, Verifying IPv4 and Troubleshooting IPv4 Implementing and troubleshooting an IPv4 network	Lecture/ In-Lab Supervised Work	In-Lab Exercises/ Assignment I
4	2 - 2	A1, B1, B3, C1, C2	Overview of the DHCP server role, Deploying DHCP, Managing and troubleshooting DHCP Implementing DHCP	Lecture/ In-Lab Supervised Work	In-Lab Exercises
5	2 - 2	B1, B3	Planning a DHCP server implementation, Implementing the DHCP configuration, Validating the DHCP implementation	Lecture/ In-Lab Supervised Work	In-Lab Exercises
6	2 - 2	A1, B1, B3	Overview of IPv6 addressing, Configuring an IPv6 host, Implementing IPv6 and IPv4 coexistence,	Lecture/ In-Lab Supervised Work	In-Lab Exercises
7	2 - 2	B1, B3, C1, C2	Transitioning from IPv4 to IPv6, Configuring and evaluating IPv6 transition technologies	Lecture/ In-Lab Supervised Work	In-Lab Exercises/ Lab Test I
8	2 - 2	B1, B3	Implementing DNS servers, Configuring zones in DNS, Configuring name resolution between DNS zones	Lecture/ In-Lab Supervised Work	In-Lab Exercises

9	2 - 2	B1, B3, D2, D3	Configuring DNS integration with Active Directory Domain Services (AD DS) Planning and implementing name resolution by using DNS	Lecture/ In-Lab Supervised Work	In-Lab Exercises/ Assignment II
10	2 - 2	A1, B1, B3, C1, C2	Overview of IPAM, Deploying IPAM. Managing IP address spaces by using IPAM Implementing IPAM Installing the IPAM Server feature, Provisioning the IPAM Server, Managing IP address spaces by using IPAM	Lecture/ In-Lab Supervised Work	In-Lab Exercises
11	2 - 2	A1, B1, B3	Overview of remote access, Implementing the Web Application Proxy, Implementing Web Application Proxy, Validating the Web Application Proxy deployment	Lecture/ In-Lab Supervised Work	In-Lab Exercises
12	2 - 2	A1, B1, B3, C1, C2	VPN concepts, Planning VPNs, Implementing VPNs, Validating the VPN deployment, Troubleshooting VPN access	Lecture/ In-Lab Supervised Work	In-Lab Exercises
13	2 - 2	A1, B1, B3, C1, C2	Networking features and considerations for branch offices, Implementing Distributed File System (DFS) for branch offices, Implementing BranchCache for branch offices	Lecture/ In-Lab Supervised Work	In-Lab Exercises/ Lab Test II
14	2 - 2	A1, B1, B3, D2, D3	Overview of high performance networking features, Configuring advanced Microsoft Hyper-V networking features	Lecture/ In-Lab Supervised Work	In-Lab Exercises/ Assignment III
15	2 - 2	A1, B1, B3	Overview of SDN,	Lecture/	

			Implementing network virtualization, Implementing Network Controller	In-Lab Supervised Work	
16	2 - 0		All Topics		Final Exam

Teaching Materials:

Textbook(s):	Greg Tomsho, (2018), MCSA Guide to Networking with Windows Server 2016, Exam 70-741, Cengage Learning, ISBN: 978-1337400787
Handout(s):	- Internal handouts (Hardcopies) prepared by course instructors. - PowerPoint slides available on Moodle i.e. http://www.ahlia.edu.bh/moodle
Reference(s):	- Kozierok, C.M., 2005. The TCP/IP guide: a comprehensive, illustrated Internet protocols reference. No Starch Press. - Laan, S., 2017. IT Infrastructure Architecture-Infrastructure Building Blocks and Concepts Third Edition. Lulu. com.

Assessments:

Method of Assessment	Description	Learning Outcomes	Weighting
Assignments	Three group assignments to be given to students, each assignment worth 10 marks. The assignments contain several questions designed to help students consolidate the concepts learned.	A1, B1, B3, C1, C2, D2, D3	30%
Lab Tests	Two practical tests to be given to students during lab time where each will take two hours and worth 15 marks. The total of both tests will be considered at the end. The first test will cover topics from week 1 to 7 and the second test will cover topics from week 8 to 13.	B1, B3, C1, C2	30%
Final Exam	The final exam is a comprehensive, written exam and will be of 2 hours. It will assess students' knowledge and skills.	A1, B1, C1, C2	40%
In- Lab Exercises	In-Lab Exercises will allow the students to practice planning and implementing the covered topics.	B1, B3, C1, C2	Formative
Overall			100 %

Admissions	
Minimum number of students	5
Maximum number of students	20

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