

QF01/0408-4.0E	Course Plan for Bachelor program - Study Plan Development and Updating Procedures/ Cyber Security Department
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Study plan No.	2022/2021		University Specialization		Cyber security	
Course No.	0125233		Course name		Infrastructure Security Using Linux	
Credit Hours	3		Prerequisite/ Co-requisite		Computer network(1)	
Course type	<input type="checkbox"/> MANDATORY UNIVERSITY REQUIREMENT	<input type="checkbox"/> UNIVERSITY ELECTIVE REQUIREMENTS	<input type="checkbox"/> FACULTY MANDATORY REQUIREMENT	<input type="checkbox"/> Support course family requirements	<input checked="" type="checkbox"/> Mandatory requirements	<input type="checkbox"/> Elective requirements
Teaching style	<input type="checkbox"/> Full online learning		<input type="checkbox"/> Blended learning		<input checked="" type="checkbox"/> Traditional learning	
Teaching model	<input type="checkbox"/> 1 Synchronous: 1 asynchronous		<input type="checkbox"/> 1 face to face : 1 asynchronous		<input checked="" type="checkbox"/> 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
1	11:00-12:30	Lab13		Traditional learning	2Traditional
2	11:00-12:30	Lab13		Traditional learning	2Traditional

**Brief description**

<b>The students will have knowledge in underlying operating systems environments such as Linux and Windows and how they contribute, as hosts, to the success of many other applications like network operations and data centers. Students will gain the skills needed to protect Unix and Linux servers from various types of threats. They will learn how to manage users, groups, permissions, ownership, storage, files, directories, kernel modules, Linux boot process, system components, devices, networking, packages, software, and system security.</b>
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**Learning resources**

Course book information (Title, author, date of issue, publisher ... etc)	Jason Nufryk and Damon Garn, The Official CompTIA Linux+ Student Guide, CompTIA, first edition, 2019.
Supportive learning resources (Books, databases, periodicals, software, applications, others)	1- Evi Nemeth, Garth Snyder, Trent R. Hein, Ben Whaley and Dan Mackin, UNIX AND LINUX SYSTEM ADMINISTRATION HANDBOOK, Pearson Education, FIFTH EDITION, 2018. 2- Christine Bresnahan and Richard Blum, CompTIA Linux+ Study Guide, John Wiley & Sons, Inc., 4rd ed., 2019. 3- Karnel Erickson, Cyber security: Kali Linux for hackers and Hacker Basic Security, 2019.
Supporting websites	

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The physical environment for teaching	<input type="checkbox"/> Class room	<input checked="" type="checkbox"/> Labs	<input type="checkbox"/> Virtual educational platform	<input type="checkbox"/> Others
Necessary equipment and software	<b>Vmware/virtual box and kali linux</b>			
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
<b>Knowledge</b>		
<b>K1</b>	<b>Introducing Linux operating system philosophy</b>	MK1
<b>K2</b>	<b>Describes Users, Groups, Permissions and Ownership in Linux</b>	MK1
<b>K3</b>	<b>Introducing the Storage, Files, and Directories Management in Linux</b>	MK1
<b>K4</b>	<b>Demonstrates the Kernel Modules, Linux Boot Process, System Components.</b>	MK1
<b>K5</b>	<b>Introducing the Devices, Networking, Packages, and Software in Linux.</b>	MK1
<b>Skills</b>		
<b>S1</b>	Applying and exploring shell commands of Linux operating system.	MS4
<b>S2</b>	Managing the users, groups, permissions, ownership, storage, files, directories, kernel modules, Linux boot process, system components, devices, networking, and packages & software in Linux.	MS4
<b>S3</b>	Securing Linux systems in Linux operating system.	MS2
<b>Competences</b>		
<b>C1</b>	<b>Make judgments with regards to relevant scientific, societal, and ethical aspects, and testing &amp; decide with the working team whether a given Linux system configuration is secure or not.</b>	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%	30%	30%
Participation / practical applications	0	0	20%	30%
Asynchronous interactive activities	30%	20%	0	0
Final exam	40%	50%	50%	40%

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**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	Performing Basic Linux Tasks	Lecture, learning through applying shell commands, using help with Linux	1-33
2	Managing Users and Groups	Lecture, learning through creating, deleting, modifying, configuring users and groups	35-74
3	Managing Permissions and Ownership	Lecture, learning through modifying permissions and ownership for files and directories.	75-112
4	Managing Permissions and Ownership	Lecture, learning through modifying permissions and ownership for files and directories.	75-112
5	Managing Storage	Lecture, learning through managing volumes using the Logical Volume Manager (LVM) and Linux file systems.	113-176
6	Managing Files and Directories	Lecture, learning through performing various operations on files and directories	177-236
7	Managing Kernel Modules	Lecture, learning through identifying, installing, configuring and monitoring kernel modules, and the role and functions of the	237-259

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		Linux kernel.	
8	Managing the Linux Boot Process	Lecture, learning through configuring components that make up the Linux boot process and the GNU GRUB 2 boot loader.	261-282
9	<b>Mid exam</b>		
10	Managing System Components	Lecture, learning through configuring localization options such as character sets and environment variables and graphical user interfaces (GUIs), managing services.	283-344
11	Managing Devices	Lecture, learning through identifying, configuring and monitoring the different types of devices that support the Linux OS.	345-379
12	Managing Networking	Lecture, learning through identify the fundamental concepts of the TCP/IP networking protocol and the roles that various Linux servers can play, and connecting to a network, and configuring DNS and DHCP client services.	381-452
13	Managing Networking	Lecture, learning through identify the fundamental concepts of the TCP/IP networking protocol and the roles that various Linux servers can play, and connecting to a network, and configuring DNS and DHCP client services.	381-452
14	Managing Packages and Software	Lecture, learning through identifying the most common package managers in Linux, including RPM and dpkg, managing RPM packages with the YUM front-end, managing	453-490

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		Debian packages with the APT front-end, and configuring package repositories.	
15	Review and practice		
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
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