



Paitaxt Technical Institute
Department of Networking

Linux

Course Book

Second Year

M.Sc. Hangaw Q. Omar

Academic Year: 2017/2018

Paitaxt Technical Institute
Department of Networking.
Lecturer in Charge: Hangaw Q. Omar
Course Title: Linux.
Credits: 3 hours.



معهد بايتخت التقني
قسم الشبكات
اسم التدريسي : هانغاو قادر عمر
عنوان الكورس : Linux.
عدد الساعات : 3 ساعات

1. Course name	Linux.
2. Lecturer in charge	Hangaw Q. Omar
3. Department/ College	Networking Department.
4. Contact	009647507227722
5. Time (in hours) /week	1 hour theory and 2 hours practical per week
6. Office hours	Sunday 8:30 – 11:30
7. Teacher's academic profile	<ul style="list-style-type: none">• BSc Computer Engineering, IRAQ 2014• MSc Computer System Engineering, IRAQ ,2016
8. Keywords	Kernel, GUI, BASH, Root, Ubuntu.
9. Course overview (مقدمة) :	<p>UNIX and 'UNIX-like' operating systems (such as Linux) consist of a <i>kernel</i> and some <i>system programs</i>. There are also some <i>application programs</i> for doing work. The kernel is the heart of the operating system. In fact, it is often mistakenly considered to be the operating system itself, but it is not. An operating system provides many more services than a plain kernel.</p> <p>It keeps track of files on the disk, starts programs and runs them concurrently, assigns memory and other resources to various processes, receives packets from and sends packets to the network, and so on. The kernel does very little by itself, but it provides tools with which all services can be built. It also prevents anyone from accessing the hardware directly, forcing everyone to use the tools it provides. This way the kernel provides some protection for users from each other. The tools provided by the kernel are used via <i>system calls</i>.</p>

10. Course objective (الاهداف):

The objectives behind giving this course can be listed as below:

Linux is a command line interface, used by most large, powerful computers.

- It is very popular, and very easy to find information and get help
- Linux is very stable - computers running Linux almost never crash
- Linux is very efficient which can smoothly manage extremely huge amounts of data
- Most new bioinformatics software is created for Linux - its easy for the programmers

11. Student's obligation (واجبات الطالب والتزاماته)

In this course, attendance is one of the mandatory tasks for students, since the key idea behind each topic the subject would be given during the lab. Also, assignments plays an important role in keeping track of comprehending all the skills and problem-solving methods for topics. Exams are the true criterion for measuring the depth of students' understanding to the given material.

12. Forms of teaching (طرق التدريس)

Whiteboard, Magic pens, Data show, PowerPoint, Assignments and class works.

13. Assessment scheme (مخطط التقييم)

The 100 marks will be divided into:

Mid-term 1 Exam	20 %
Mid-term 2 Exam	20%
Classroom Participation and Attendance	5%
Quiz	5%
Final Exam	50 %
Total	100%

15. Course Reading List and References (المصادر):

1. Getting started with Ubuntu 14.4 (The Ubuntu manual team).
2. Linux professional institute certification 3rd edition (Study guide).
3. Linux: The Complete Reference, Sixth Edition – 1 Jul 2017
4. Linux in Nutshell – 14 Aug 2009
5. Shell Programming: Bash Scripting from First Steps to Confident User.

16. The Topics:

Lecturer's name

Theoretical and practical topics.

Hangaw

Week 1

- 1) What is Linux? Why Linux?
 - a) History of Linux.
 - b) Difference Between Linux and Windows.
 - c) Difference Between Linux and Unix.

Week 2

- d) GNU
 - e) Usage
 - f) Career Options
 - g) Interesting Facts about Linux.
 - h) Why Linux is Virus proof?
 - i) Various Linux Distributions.
 - j) Pros and Cons
- 2) Root
 - a) Who/why/what is root

Week 3

- 3) Basic commands
 - a) mkdir
 - b) touch
 - c) ls
 - d) pwd

Week 4

- e) cd
- f) chmod
- g) df
- h) du
- i) dd
- j) adduser

Week 5

- k) sort
- l) passwd
- m) rm/rmdir
- n) date
- o) tar
- p) gzip
- q) top

Week 6

- 4) Editors
- a) Vi Editor

Week 7

- 5) GNU/LINUX OS Installation

Week 8

- 6) Basic System configuration and Administration.

Week 9

- 7) OS Installation.

Week 10

- 8) Understanding Files and Directories in Linux

Week 11

- a) File Structure and hierarchy

Week 12

b) File Permissions

c) LVM overview

Week 13

9) Schedulers

a) cron

b) at

Week 14

10) User Administration

11) Software Installation In Linux.

a) RPM

b) make

Week 15

12) Linux Boot process

a) Boot Loaders (LILO and GRUB)

b) System Initialization

Week 16

c) inittab

d) rc.sysinit

e) rc

Week 17

13) LVM (Logical Volume Manager)

Week 18

a) Volume groups

b) Physical and logical volumes

c) Resizing LVs etc

Week 19

14) TCP/IP Network Management.

a) route

b) ifconfig

c) ping

d) netstat

Week 20

15) Driver/Module Installation and Removal.

a) modprobe

b) rmmod

c) insmod

d) lsmod

e) modinfo

Week 21

16) Log Monitoring and rotating

Week 22

17) OpenSSH - The GNU/Linux Secure Shell

a) ssh

b) Sshd

c) scp

18) sudo and su - Giving users Superuser Privileges

Week 23

19) Linux Administration.

a) Single User Mode

b) Rescue Mode

c) IP Tables

Week 24

d) File Sharing with SAMBA

Week 25

e) NFS

f) Mail Server using SENDMAIL

Week 25

g) Web Server installation (apache)

Week 26

h) Proxy Server installation using SQUID.

- i) Firewalling using iptables
- j) PAM (plug gable Authentication modules)
- k) Linux Performance Monitor

Week 26

- l) SAR utility.
- m) Monitor CPU using sar
- n) track Application causing Memory Leak

Week 27

- 20) Linux Hardening.

Week 28

- 21) Linux Scripting using bash
 - a) awk
 - b) sed
 - c) grep

Week 29

- d) while
- e) for
- f) echo

Week 30

- g) variables
- h) functions
- 22) Information over open source projects
 - a) lynis(Unix-based auditing tool)
 - b) rootkit hunter.

Assist. Lecturer.

Hangaw Q. Omar