

Faculty: FACULTY OF TELECOMMUNICATIONS AND MANAGEMENT
Department: INFORMATION TECHNOLOGIES
Professional Field: 5.3 COMMUNICATION AND COMPUTER TECHNOLOGY
Specialty: COMMUNICATION NETWORKS AND CYBERCRIME INVESTIGATION
Educational-qualification degree: MASTER

LEARNING COURSE DESCRIPTION

- 1.Course title:** Linux OS
- 2.Course code:** M.06.009.1
- 3.Type of the course:** Compulsory
- 4.Level:** Master
- 5.Year of study:** first
- 6.Semester:** second
- 7.Number of credits:** 6
- 8.Name of the lecturer:** Assoc. Prof. Strahil Sokolov, Eng, PhD
- 9.Course learning outcomes:**

The aim of the course is to provide the students of UTP with knowledge on the Linux OS essentials and build certain system administration skills while preparing for Cybercrime investigations. Material presented includes CentOS, Debian and Ubuntu installation; general Linux concepts and basic commands; compression and archiving; online help; file system hierarchy concepts, and file and directory operations; file types, access permissions, and ownership; file linking, searching, and special permissions; text file editing and data manipulation with filter programs; regular expressions; Bash shell commands and process management; shared library management; Debian and rpm package administration; Linux OS boot process and initialization; hardware device management and kernel modules; disk partitioning and file system build and repair; and quota and swap administration. Additional focus is provided for the UTP students in this course on administration and troubleshooting tasks; automation with shell scripts; SQL database maintenance and querying; users, groups, password policies, and shell startup files; networking configuration; routing and Internet services; network connection performance tuning and troubleshooting.

Students who complete their training within this course *should acquire:*

Basic knowledge of Linux system architecture, installation and package management, GNU and UNIX commands devices, filesystems, filesystem hierarchy, shells, scripting and data management, boot process management and system services, Linux security.

Practical skills for installation, administration and troubleshooting of a Linux system.

Competences:

- setting up a lab environment with CentOS, Debian or Ubuntu
- explain and evaluate Linux related concepts and additions, such as systemd and journald
- administer Linux-based systems in Virtual or Physical environment.

11. Prerequisites:

Operating systems, Basics of Programming.

12. Course contents:

Installing Linux and Using Basic Commands. Accessing the Linux Command Prompt. Working with Files and File Permissions Filesystem Hierarchy Standard (FHS). Editing Text Files, Exploring Filters, and Using Regular Expressions. Dealing with the Bash Shell and Processes. Booting Linux and Initializing the System. Understanding and Configuring Hardware and Kernel Modules. Administering Partitions, File Systems, and Swap MBR, GPT, and Partitions. Writing Shell Scripts and Managing a SQL Database. Managing Users and Groups. Understanding Networking and Administering Network. Understanding Internationalization, and Configuring. Localization, NTP, and DNS. Managing User Interfaces, Desktops, and Printers. Scheduling Tasks, Logging Messages, and Using TCP Wrappers.

13. Bibliography

Basic literature:

1. Asghar Ghori, "CompTIA® Linux+™/LPIC-1, Training and Exam Preparation Guide", ISBN: 978-1-7750621-1-0 (e-book), 2017
2. Christopher Negus, "Linux Bible, 10th Edition", ISBN: 978-1-119-57889-5 June 2020, Indianapolis, Indiana : John Wiley & Sons, Inc., [2020] ©2020

Additional literature:

1. Brian Ward, "How Linux Works, 3rd Edition: What Every Superuser Should Know", April 2021, 464 pp. ISBN-13: 9781718500402, No Starch Press
2. Richard Blum, Christine Bresnahan, "Linux Command Line and Shell Scripting Bible, 4th Edition", ISBN: 978-1-119-70091-3 January 2021, John Wiley & Sons
3. Evi Nemeth, Garth Snyder, Trent R. Hein, Ben Whaley, Dan Mackin, "UNIX and Linux System Administration Handbook, 5th Edition", ISBN-13: 978-0-13-427755-4, Published Aug 8, 2017 by Addison-Wesley Professional.

14. Assessment methods and criteria:

The course ends with an exam. The final grade for the course is formed by a final test. The written test covers open and closed questions on the material indicated in the syllabus and presented at the lectures on the course. The criteria are: completeness, accuracy and thoroughness in answering the questions in the test. The discipline test consists of up to 100 questions. The answer to each question of the test is evaluated. Comprehensive, accurate and thorough development of one question from the test is evaluated with 10 points. Maximum number of points - 100.

The grade obtained from current control (formed by the points from the practical exercises and the conducted control works for checking the theoretical and practical mastery) and the grade from the written exam are transformed into a final grade according to the six-point system.

15. Language of instruction: English