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VNUHCM-UNIVERSITY OF SCIENCE
FACULTY OF INFORMATION TECHNOLOGY

COURSE SYLLABUS
CS11117 – Linux Operating System and Applications

1. GENERAL INFORMATION

Course name:	Linux Operating System and Applications
Course name (in Vietnamese):	Hệ điều hành Linux và Ứng dụng
Course ID:	CS11117
Knowledge block:	Specialization
Number of credits:	4
Credit hours for theory:	45
Credit hours for practice:	30
Credit hours for self-study:	90
Prerequisite:	No
Prior-course:	Computer Networking
Instructors:	Lê Hà Minh

2. COURSE DESCRIPTION

This course equips students with both fundamental and advanced knowledge of the Linux operating system, covering topics such as installation, user and file system management, software installation, command-line operations, and shell scripting. It also introduces key concepts in computer networking and network security, including network configuration and services like DNS, DHCP, SSH, web, mail, and firewall. In addition, students are introduced to essential DevOps tools. Emphasizing hands-on practice, the course lays a solid foundation for further study in areas such as cloud computing, system administration, and software development.

3. COURSE GOALS

At the end of the course, students are able to

ID	Description	Program LOs

G1	Use personal and teamwork skills to analyze and implement technologies using Linux.	2.1.1, 2.2.1, 2.2.2, 2.3.1
G2	Identify and compare English terminology related to Linux components and services.	2.4.3, 2.4.5
G3	System-level thinking to detect and resolve issues during system/service design, implementation, and operation on Linux.	4.1.1,4.1.2,4.1.3, 4.1.4, 4.3.2, 4.2.3,4.2.4
G4	Administer Linux-based systems.	5.4.1,5.4.3,1.2.1,5.1.2
G5	Administer common Linux services.	5.4.1,5.4.3,1.2.1,5.1.2
G6	Administer Internet-based network services using Linux.	5.4.1,5.4.3,1.2.1,5.1.2
G7	Deploy real-world network applications on Linux environments.	5.4.1,5.1.1,5.1.2

4. COURSE OUTCOMES

CO	Description	I/T/U
G1.1	Analyze, synthesize, implement, and write technical documentation individually or in collaboration with a team.	U
G2.1	Distinguish and compare English technical terms related to the course.	I
G2.2	Read and analyze English materials related to the lectures.	I
G3.1	Demonstrate system-level analytical and critical thinking skills to identify and resolve issues arising during the design, implementation, and operation of services running on the Linux operating system.	I, T
G4.1	Describe the characteristics of the Linux operating system, along with its advantages and challenges.	U
G4.2	List commonly used Linux distributions in practice and explain their intended use cases.	I,T

G4.3	Describe the main steps in the process of installing and configuring Linux.	I,T
G4.4	Describe boot parameters and environment variables in Linux.	I,T
G4.5	Use tools in the Linux environment to perform system administration tasks on a standalone machine, such as user management, file permission settings, policy configuration, software installation, and disk management.	I,T
G4.6	Demonstrate proficiency in using the command line and writing shell scripts in Linux.	I,T
G5.1	Proficiently use administrative tools on Linux.	I,T
G5.2	Install and manage the SSH network service on a Linux environment.	I,T
G5.3	Install and manage the DHCP network service on a Linux environment.	I,T
G6.1	Install and manage the DNS network service on a Linux environment.	I,T
G6.2	Install and manage the web service on a Linux environment.	I,T
G6.3	Install and manage the mail service on a Linux environment.	I,T
G7.1	Install and manage NAT and firewall services on a Linux environment.	I, T
G7.2	Install and manage several basic DevOps tools	I, T

5. TEACHING PLAN THEORY

ID	Topic	Course outcomes	Teaching/Learning Activities (samples)	Assessments

1	Introduce to Linux Linux Command Lines User and Group Management	G4.1,G4.2,G4.3, G4.4	Lecturing Demonstration, Q&A	Quiz 1, 2
2	File Management Software Management Process Management	G4.5	Lecturing Demonstration, Q&A	Quiz 3
3	Shell script programming	G4.6	Lecturing Demonstration, Q&A	
4	Linux Network Basics SSH Service	G5.1,G5.2	Lecturing Demonstration, discussion	Quiz 4, 5
5	DHCP Service	G5.3	Question & answer Case study and discussion	Quiz 6
6	DNS Service	G6.1	Question & answer Case study and discussion	Quiz 6
7	Web Service	G6.2	Question & answer Case study and discussion	Quiz 7
8	Mail Service	G6.3	Question & answer Case study and discussion	Quiz 7
9	NAT & Firewall	G7.1	Question & answer Case study and discussion	Quiz 8
10	Seminar	G7.2	Case study, discussion	PRJ1
11	Review	G7.1,G7.2,G1.1, G2.1,G2.2	Lecturing Q&A, Discussion Project submitted	EXAM1

6. LABORATORY

ID	Topic	Course outcomes	Teaching/Learning Activities (samples)	Assessments
1	Linux Basic Management	G4.1,G4.2,G4.3, G4.4, G4.5	Provide instructions	HW 1, 2
2	Shell script programming	G4.6	Lecturing Demonstration, Provide instructions	HW 3, 4
3	Linux Network Management	G5.1, G5.2, G5.3, G6.1, G6.2, G6.3, G7.1	Provide instructions Demonstration, discussion	HW 5, 6, 7

7. ASSESSMENTS

ID	Topic	Description	Course outcomes	Ratio (%)
A1	**Quizzes**			**10%**
A12	Quiz 1, 2, 3, 4, 5, 6, 7, 8	Reviewing based on knowledge taught in class	G4.1,G4.2,G4.3, G4.4, G4.5, G4.6, G5.1, G5.2, G5.3, G6.1, G6.2, G6.3, G7.1	10%
A2	**Homeworks**			**20%**
A12	Homework: HW1, HW2, HW3, HW4	Practicing based on knowledge taught in class	G4.1,G4.2,G4.3, G4.4, G4.5, G4.6, G5.1, G5.2, G5.3, G6.1, G6.2, G6.3, G7.1	20%

A3	**Projects**			**30%**
A31	Project: PRJ1	Investigating basic DevOps tools		30%
A4	**Exams**			**40%**
A41	Final exam: EXAM1	Closed book exam. Describe the understanding of different topics		40%

8.   RESOURCES

Textbooks

- A Practical Guide to Linux Commands, Editors, and Shell Programming (3rd Edition), Mark G. Sobell
- Mastering Linux Network Administration, Jay LaCoix
- Pro Linux System Administration, James Turnbull, Peter Lieverdink, and Dennis Matotek

9. GENERAL REGULATIONS & POLICIES

- All students are responsible for reading and following strictly the regulations and policies of the school and university.
- Students who are absent for more than 3 theory sessions are not allowed to take the exams.
- For any kind of cheating and plagiarism, students will be graded 0 for the course. The incident is then submitted to the school and university for further review.
- Students are encouraged to form study groups to discuss on the topics. However, individual work must be done and submitted on your own.