SYLLABUS
NT132 – NETWORK AND SYSTEM ADMINISTRATION

1. GENERAL INFORMATION

Course name (Vietnamese):	**Quản trị mạng và hệ thống................................**
Course name (English):	**Network and system administration** ....
Code:	**NT132** ....
Type of course:	Fundamental ....
Deparment:	Faculty of Computer Networks and Communications
Instructor:	MSc. Trần Thị Dung, MSc. Nguyễn Duy
	MSc. Tô Nguyễn Nhật Quang
	Email: dungtt@uit.edu.vn
Number of credits:	4
Theory:	3...
Lab:	1...
Self-study:	....
Prerequisite course(s):	....
Pre-course(s):	IT005 - Introduction to Computer Networks ....

2. COURSE DESCRIPTION

This course aims to provide students fundamental skill and knowledge of:

– Basic operations of network devices, network protocols.

– Basic configuration of network devices.

– Installing, configuring and implementing network services, network application on Windows and Linux..

– Managing the services for the system: DHCP, Web, DNS …

– Monitoring the network and system.

3. COURSE GOALS

Goal No.	Goal description	Program outcomes	Level (Bloom)
G1	Describe the functions of the components in a network and system topology	*LO2 (2.7.3), LO6 (6.2.2)*	*Knowledge - 3*
G2	Identify the required configurations for a network and system model, and implement the configurations for a network topology	*LO3 (3.1, 3.2)*	*Skill - 4*
G3	Implement and deploy the network applications, network service in a network topology	*LO3 (3.3)*	*Skill - 4*

4. COURSE LEARNING OUTCOMES

Table 2.

Course outcomes	Descriptions	Level of teaching
G1.1	Describe the functions of the components in a network and system topology	*I*
G1.2	Read the course material in English	*I*
G2.1	Identify the required configurations for a network and system model	*I, T*
G2.2	Implement the configurations for a network topology	*I,T,U*
G3.1	Implement and deploy the network applications, network service in a network topology	*I,T,U*

(I – Introduce, T – Teach, U – Utilize)

5. COURSE CONTENT, LESSON PLAN

a. Theory

Table 3.

Week (X hours)	Contents	Course learning outcomes	Activities	Assessment element

1 (3 class hours)	**Chapter 1: Introduction to network device and network infrastructure** 1.1 Introduction 1.2 Router and routing	G1.1	**Group formation.** **Teaching:** lecturer gives structions, demo, question **Study in class:** exchange related issues, problems. **Study at home:** do homework	*A1.1, A4*
2+3 (6 class hours)	**Chapter 2: Routing** 2.1 Static routing 2.2 Dynamic routing 2.2.1 Distance-vector routing 2.2.2 Link-state routing	G1.1, G2.1	**Group allocation.** **Teaching:** lecturer gives structions, demo, question **Study in class:** exchange related issues, problems. **Study at home:** do homework	*A1.1, A4*
4 (3 class hours)	**Chapter 3: Switch and VLAN** 3.1 Giới thiệu switch 3.2 VLAN 3.3 Inter-VLAN routing 3.3.1 Legacy 3.3.2 Router-on-a-stick 3.3.3 Multilayer switch	G1.1, G2.1	**Group allocation.** **Teaching:** lecturer gives instructions, demo, question **Study in class:** exchange related issues, problems, Group discussion. **Study at home:** Learn the online course and do report (Reference 8.1)	*A2.1, A4*
5+6 (6 class hours)	**Chapter 4: Network services** 4.1 DHCP 4.2 ACL 4.3 NAT	G1.1, G2.1	**Teaching:** lecturer gives structions, demo,	*A1.1, A4*

			question **Study in class:** exchange related issues, problems. **Study at home:** do homework	
7 (3 class hours)	**Chapter 5: Overview on server** 3.1 Linux Server 3.2 Windows Server 3.3 Cloud Server **Assign the projects to the groups**		**Teaching:** Explain the project requirements, project criteria. Instruct groups to do projects and do reports **Study in class:** Discuss the projects **Study at home:** Do project	-
8 (3 class hours)	**Chapter 6: Linux management** 6.1 Linux OSes 6.2 Quản trị user/group 6.3 Network management commands/utilities 6.4 Network services	G1.1, G1.2	**Teaching:** lecturer gives structions, demo, question **Study in class:** exchange related issues, problems. **Study at home:** Do the lab in the the online course and do report (Reference 8.1)	*A1.1, A4*
9 (3 class hours)	**Chapter 7: Windows management** 3.1 Overview 3.2 Windows Server installation 3.3 Basic configuration 3.4 Network service	G1.1, G2.1	**Teaching:** lecturer gives instructions, demo, question **Study in class:** exchange related issues, problems, group discussion.	*A1.1, A4*

	configuration 3.5 Troubleshooting				
10 (3 class hours)	**Midterm report on the project**			**Teaching:** discuss and support students on the projects **Study in class:** discuss and raise the project problems.	-
11-14	**Students present theirs project results.**	G2.2, G3.1		Students report project. Groups evaluate the other group presentations. Students take the test after the presentation	*A1.2*
	Chapter 8: Network management -SNMP 5.1 Network management 5.2 Simple Network Management Protocol (SNMP) 5.3 Opensource network management tools **Exam preparation**	G1.1, G2.1		**Teaching:** lecturer gives instructions, demo, question **Study in class:** exchange related issues, problems.. Group discussion.	*A1.1, A4*

b. **Lab**

Table 4.

Week (X hours)	Contents	Course learning outcomes	Activities	Assessment element
1	**Lab 1**: Network device configuration	G2.2	**Teaching:** lecturer describes the objective of the lab and gives instructions for students **Study in class:** Students follow the instruction of the lab.	*A3*

			Self-study: Students read the instruction and prepare the lab at home.	
2	**Lab 2:** Linux installation and configuration	G2.2	**Teaching:** lecturer describes the objective of the lab and gives instructions for students **Study in class:** Students follow the instruction of the lab. **Self-study:** Students read the instruction and prepare the lab at home.	*A3*
3	**Lab 3:** Windows Server installation and configuration	G2.2	**Teaching:** lecturer describes the objective of the lab and gives instructions for students **Study in class:** Students follow the instruction of the lab. **Self-study:** Students read the instruction and prepare the lab at home.	*A3*
4	**Lab 4**: NAT, ACL configuration	G2.2	**Teaching:** lecturer describes the objective of the lab and gives instructions for students **Study in class:** Students follow the instruction of the lab. **Self-study:** Students read the instruction and prepare the lab at home.	*A3*
5	**Lab 5**: Opensource network monitor installation and configuration	G2.2	**Teaching:** lecturer describes the objective of the lab and gives instructions for students **Study in class:** Students follow the instruction of the lab. **Self-study:** Students read the instruction and prepare the lab at home.	*A3*
6	**Lab 6:** Implement a	G2.2, G3.1	**Teaching:** lecturer describes the objective of the lab and gives	*A3*

topology including all the components		instructions for students **Study in class:** Students follow the instruction of the lab. **Self-study:** Students read the instruction and prepare the lab at home.	

6. COURSE ASSESSMENT

Table 5.

Assessment element	Course learning outcomes	Percentage (%)
A1. Progress assessment A1.1 In-class exercise /homework/quiz A1.2 Course project	*G1.1, G2.1* *G2.2, G3.1*	*10%* *20%*
A2. Mid-term exam		*0%*
A3. Lab	*G2.2, G3.1*	*20%*
A4. Final exam	*G1.1, G2.1, G3.1*	*50%*

a. Assessment A1.1

The lecturer assigns various types of exercises for students to evaluate the outcome G1.1, G2.2. The assessment types can be used (but is not limited to):

- Exercise/Quiz at the beginning of the lesson: check the knowledge of the previous lessons to summarize the knowledge of the old lesson.
- Inclass exercise/quiz: check the students' receptivity to adjust the teaching progress of the next lesson..
- Homework: the configuration exercise.

b. Assessment A1.2

Rubric for the course project to evaluate G2.2 and G3.1, the instructors can customize according to the projects in each semester.

Criteria	4	3	2	1
Report (1p)	The report has full required contents and good format.	The report has full required contents but inconsistent format, or good format but lack of 1	The report is lack of 1 required part and inconsistent format.	The report is lack of more than 1 required part and inconsistent format.

			The group has at least one member that is good presenter, interacting with the audiences	All members in the group just looked at the slide and read
Presentation (1p)	All members are good presenters.	2-3 members are good presenters.	The group has at least one member that is good presenter, interacting with the audiences	All members in the group just looked at the slide and read
Literature review/Theory background (2p)	Describe the definition, components, operation of the topic clearly in their own way.	Describe the definition, components, operation of the topic but 1 part is unclear.	Describe the definition, components, operation of the topic but more than 1 part is unclear.	Describe the definition, components, operation unclearly or the content is copied from Internet.
Implementation (5p)	Demo on both the basic requirements and advanced requirements	Demo on the basic requirements and a part of advanced requirements	Demo on the basic requirements	There is no demo
Understand the presentation (1p)	Quiz after the presentations.			

c. **Assessment A3**

The practice test score is the average of 6 practice sessions, each practice has a marking giude.

d. **Assessment A4**

The final exam includes (but is not limited to)
- Multiple choice questions: 20 - 25 question for G1.1
- Written: 2-3 questions for G2,1, G3.1.

7. **COURSE REQUIREMENTS AND EXPECTATIONS**

− Laboratory: labs can be done in group in laboratories. Lecturer describes the objective of the lab and gives instructions for students. Students must fulfill all lecturer's requirements. Late submission is not accepted.

− Projects: lecturers hand out team-work projects for the students to do. Late submission is not accepted.

− Class attendance: Students are checked their attendance in class by in-class assignment. Failing to show up by the time of checking is considered to be absent.

− Students need to read slide before the class.

– Final examination: Students that fail to show up on the examination day without acceptable reasons will get 0.

8. COURSE MATERIALS

1. Lazaro (Laz) Diaz, CCNA Routing and Switching 200-125 Certification Guide, Packt Publishing, 2018
2. Evi Nemeth, Garth Snyder, and Trent R. Hein, Linux Administration Handbook 2nd edition, Prentice Hall, 2007.
3. Jordan Krause, Mastering Windows Server 2016, Packt Publishing, 2016

Reference

1. Free NDG Linux Essentials course: https://www.netacad.com/courses/os-it/ndg-linux-essentials Cisco Networking Academy in collaboration with NDG (last access 30/10/2021)
2. Azure on Microsoft Learn: https://docs.microsoft.com/en-us/learn/azure/ (last access 30/10/2021)

9. SOFTWARE, TOOLS

1. Wireshark: https://www.wireshark.org/ (last access 30/10/2021)
2. Cisco Packet Tracer: https://www.netacad.com/courses/packet-tracer (last access 30/10/2021)
3. VirtualBox: https://www.virtualbox.org/ (last access 30/10/2021)

Date: Month, Date, Year

Faculty Head   **Instructor**