NATIONAL UNIVERSITY OF ENGINEERING
COLLEGE OF ELECTRICAL AND ELECTRONICS ENGINEERING

TELECOMMUNICATIONS ENGINEERING PROGRAM

IT565 – LABORATORY OF TELECOMMUNICATIONS III

I. GENERAL INFORMATION

CODE	**:**	IT565 – Laboratory of Telecommunications III
SEMESTER	**:**	9
CREDITS	**:**	01
HOURS PER WEEK	**:**	02 (Laboratory)
PREREQUISITES	**:**	IT564 – Laboratory of Telecommunications II
CONDITION	**:**	Mandatory

II. COURSE DESCRIPTION

The course aims to train the student experimentally in the use of current local area computer network (LAN) technologies. Laboratory experiences are conducted on LAN network scenarios using current switching, routing and security technologies in local area networks.

III. COURSE OUTCOMES

At the end of the course the students will:

- Configure data communication equipment such as switches and routers under different LAN scenarios.
- Produce technical reports using an established format, detailing the laboratory process developed, interpreting the results, describing the observations and formulating conclusions.
- Have the capacity for oral and written communication.
- Have the capacity for working in teams.

IV. LEARNING UNITS

LABORATORY 1: REMOTE ADMINISTRATION VIA TELNET AND SSH
Network Operating System. Command line interface. Local and remote management: telnet and SSH. VLAN concept. Extreme-to-Extreme connectivity. Presentation of the development of the laboratory experience by the student. Simulation and implementation.

LABORATORY 2: INTER VLAN INTERCONNECTION
Inter-VLANs. Static routing. Presentation of the development of the laboratory experience by the student. Simulation and implementation.

LABORATORY 3: DYNAMIC ROUTING
Dynamic routing. RIP. OSPF for single area. Presentation of the development of the laboratory experience by the student. Simulation and implementation.

LABORATORY 4: ACCES CONTROL LIST
Network Security. Access Control List (ACL). Presentation of the development of the laboratory experience by the student. Simulation and Implementation.

LABORATORY 5: DYNAMIC HOST CONFIGURATION PROTOCOL
Dynamic Host Configuration Protocol (DHCP). Presentation of the development of the laboratory experience by the student. Simulation and implementation.

LABORATORY 6: NETWORK ADDRESS TRANSLATION
Network Address Translation (NAT). Presentation of the development of the laboratory experience by the student. Simulation and implementation.

V. METHODOLOGY

The course is developed in laboratory sessions of telecommunications systems. In all sessions the active participation of students for the analysis and solution of problems is promoted. The teaching methodology of the course is based on:

- Exhibition of the objective of each laboratory experience.
- Instruction in the use of simulation tools.
- Instruction in the use of communication equipment available in the laboratory environment.
- Qualification of the development of each laboratory experience and its technical report submitted by the student.

VI. EVALUATION FORMULA

The learning will be evaluated through the "D" system:

- This course's final grade (FG) is calculated averaging the 05 highest laboratory grades.

$$FG = \frac{L1 + L2 + L3 + L4 + L5 + L6 - min(L1\ to\ L6)}{5}$$

VII. BIBLIOGRAPHY

- Huawei (2019). S2750EI, S5700, and S6720 Product Documentation. Version: 09. Release date: 2019-01-28.
- Huawei (2019). AR Series Access Routers. Product Version: V300R019. Issue: 01. Release Date: 2019-05-31.
- Huawei (2016). HCNA Networking Study Guide 2016.
- Cisco (2013). CCNA R&S 5.0 Course.
- Cisco (2016). CCNA R&S 6.0 Bridging Course.
- Tanenbaum A., Wetherall D. (2011). *Computer Networks*. Fifth Edition. Prentice Hall. United States of America.
- Kurose J., Ross K. (2017). *Computer Networking: A Top-Down Approach*. 7th ed. Pearson. England