Communications Systems and Protocols

Academic Year: (2024 / 2025) **Review date: 18-09-2024**

Department assigned to the subject: Telematic Engineering Department

Coordinating teacher: GUERRERO LOPEZ, MARIA CARMEN

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

No previous requirements

OBJECTIVES

The objectives of the Communications Systems and Protocols course are to provide knowledge of the main communication protocols applied to the field of Connected Industry 4.0. Communications layer model. The communication layer model, the structure of the Internet and the fundamentals of network technologies and devices are studied, mainly at the access, network and transport levels.

DESCRIPTION OF CONTENTS: PROGRAMME

This is a basic course on network communication that presents the basic technologies used in the Internet to enable communication between computers.

The programme has five parts:

1. Introduction to packet networks.
· Layer model for communication systems
· TCP/IP reference model (Internet).
2. Application layer in the Internet.
· Study of specific application level protocols.
3. Transport layer in the Internet.
· Congestion control in packet networks.
· UDP services.
· TCP services.
4. Network layer in the Internet.
· IP packet format.
· IP addressing.
· IP network design.
· NATs.
· Manual configuration and DHCP based configuration.
5. Link layer.
· Shared medium technologies.
· Addressing.
· Frame format.
· Link layer devices.

LEARNING ACTIVITIES AND METHODOLOGY

FORMATIVE ACTIVITIES AS DECLARED IN THE STUDY PLAN

AF1	Theoretical sessions
AF2	Practical sessions
AF4	Laboratory sessions
AF5	Tutorial
AF6	Work in groups

AF7 Individual work by the student
AF8 Exams

TEACHING METHODOLOGY
MD1 Theoretical sessions by the teacher with audiovisual support where the main concept of the course will be developed and where bibliography will be provided so as to complete the student education
MD3 Use cases resolution, exercises, etc. provided by the teacher, individually or in groups
MD5 Prepare homework or reports individually or in groups

ASSESSMENT SYSTEM

% end-of-term-examination:	40
% of continuous assessment (assigments, laboratory, practicals…):	60

SE1 Participation in class. 20%
SE2 Work in groups and individual. 40%
SE3 Final exam. 40%

The extraordinary assessment will be carried out with the same criteria as the ordinary one, with the value of the extraordinary exam being 40% of the final mark (20% class participation and 40% work done during the course). Alternatively, this assessment scheme may be replaced only (100%) by the grade obtained in the extraordinary final exam (whichever is more favourable to the student).

BASIC BIBLIOGRAPHY

- KUROSE, JAMES F., Keith W. Ross Computer Networking, a top-down approach. 8th Edition, Pearson, 2022

ADDITIONAL BIBLIOGRAPHY

- COMER, DOUGLAS E. Internetworking with TCP/IP. Vol I: Principles Protocols, and Architecture, Prentice Hall.

- STALLINGS, WILLIAM Data and Computer Communications, Prentice Hall International.

- STEVENS,W.R TCP/IP illustrated. Vol 1. The protocols, Addison. Wesley..

- TANENBAUM, ANDREW S Computer Networks, Prentice Hall International..