

Academic Year: (2021 / 2022)

Review date: 26-07-2021

Department assigned to the subject: Department of Telematic Engineering

Coordinating teacher: OTERO PÉREZ, GABRIEL

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

OBJECTIVES

BASIC COMPETENCES

CB7 That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study

CB8 That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments

CB9 That students know how to communicate their conclusions and the knowledge and ultimate reasons that sustain them to specialized and non-specialized audiences in a clear and unambiguous way

CB10 That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous

GENERAL COMPETENCES

CG5 Capacity to use the fundamental knowledge in networks, protocols and architectures so as to have the ability to propose integrated, scalable and secure solutions to monitor, analyse and optimise distributed processes

CG6 Ability to identify the requirements in devices, sensors, communications and computation in different domains of networks and applications

SPECIFIC COMPETENCES

CE5 Know, understand and know how to apply knowledge about the TCP/IP stack including routing IP, IPv6 and basic transport protocols

LEARNING RESULTS

After studying this subject the student will be able to identify and know the communication protocols applied to the Connected Industry 4.0. Skills of selection, design and application of general communications and their protocols. Understand the layer model design to analyse current communication system and protocols. Understand Internet layer model. Understand network technologies and devices fundamentals including the access layer, the network layer and the transport layer

[Link to document](#)

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

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

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

BASIC BIBLIOGRAPHY

- KUROSE, JAMES F., Keith W. Ross Computer Networking, a top-down approach. Seventh Edition, Pearson, 2017

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..