Course guides
820057 - TI - Telecommunications and Internet

Last modified: 19/06/2020

Unit in charge: Barcelona East School of Engineering
Teaching unit: 723 - CS - Department of Computer Science.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2020 **ECTS Credits:** 6.0 **Languages:** English

LECTURER

Coordinating lecturer: Antoni Pérez Poch

Others: Antoni Pérez Poch

PRIOR SKILLS

None

REQUIREMENTS

The subject is taught in English.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CEB-03. Understand the basics behind the use and programming of PCs, operating systems, databases and software with applications in engineering.

Transversal:
1. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

TEACHING METHODOLOGY

Active methodologies account for a 60% of the total workload, including project-based learning and cooperative learning.

LEARNING OBJECTIVES OF THE SUBJECT

To introduce the basic concepts involved in data communications and computer networks. Learning the possiblitices of networking and long-haul communications. Getting to know the social and economic main issues related to the Information and Communication Technologies. Being able to design, build and configure a local area network.

STUDY LOAD

Type	Hours	Percentage
Hours small group	30,0	20.00
Hours large group	30,0	20.00
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

- Basic concepts

Description:
Chapter 1: History of telecommunications.
Chapter 2: Telecommuncations Fundamentals.
Sources and data consumers. Data transfer. Modulations. Shannon equation.
Chapter 3: General concepts of Telecommunications.
Terminology. Basic concepts.
Chapter 4: Transmission Media and Access Protocols.
Features of cables and data transmission media. Medium accesss mechanisms.
Chapter 5: Transmission systems.
Coding systems. Modulation.
Chapter 6: Mobile communications.
GSM, GPRS, UMTS. Latest technologies.
Chapter 7: Computer networks.
OSI and Internet protocols. TCP/IP. Packet analysis

Related activities:
Laboratory session 1
1. Configuration of a local area network. Switches and hubs. Cable building.

Full-or-part-time: 28h 15m
Theory classes: 5h
Practical classes: 5h
Guided activities: 2h
Self study : 16h 15m

- Local area networks and Wide area Networks.

Description:
Features of a Local area network. Basic elements. Internet architecture. High-speed networks. Backbones. ATM and latest high output technologies

Related activities:
Laboratory sessions:
2. Network simulations
3. Routers configuration. Internet connexion of a local area network.
4. Technical visit.
5. Design of a local area network.

Non Presential Project:
1. Design and implementation of a local area network for a specified company.

Full-or-part-time: 96h 30m
Theory classes: 7h
Practical classes: 7h
Laboratory classes: 22h 30m
Self study (distance learning): 25h
Group work (distance learning): 25h
Guided activities: 10h

- Wireless data networks.

Description:
Chapter 9: Wireless data networks.
Description of the main wireless data communication technologies. Bluetooth, Infrared, IR, WiFi, Wimax and applications development. Security issues

Related activities:
Laboratory session:
6. Laboratory wireless data network building

Full-or-part-time: 18h 15m
Theory classes: 2h
Practical classes: 2h
Laboratory classes: 1h 15m
Self study (distance learning): 12h
Guided activities: 1h

- Social and economic implications related to these technologies

Description:
Chapter 10: Social and economic implications related to these technologies.
Social and economic changes. Current trends and future outcomes.

Related activities:
Seminars and article analysis.

Full-or-part-time: 7h
Theory classes: 1h
Practical classes: 1h
Guided activities: 2h
Self study : 3h

GRADING SYSTEM

Partial controls: 25% Exercises: 25%
Non presential (Project-based):25% Laboratory: 20% English: 5%
There is no final exam. There is no reevaluation.

EXAMINATION RULES.

All activities should be written in English.

BIBLIOGRAPHY

Basic:
- Stallings, William. Data and computer communications. 9th ed. Upper Saddle River, New Jersey: Prentice Hall, cop. 2011. ISBN 9780131392052.
- Kurose, James F.; Ross, Keith W. Computer networking : a top-down approach [on line]. Seventh edition. Harlow: Pearson Education, 2017 [Consultation: 21/04/2020]. Available on: https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=5187270. ISBN 9781292153605.

Complementary:
- Tanenbaum, Andrew S.; Wetherall, David J. Computer networks. 5th. ed., new international edition. Harlow: Pearson Education, cop. 2013. ISBN 9781292024226.
- Caballero, José Manuel. Redes de banda ancha. Barcelona: Marcombo, DL 1997. ISBN 8426711367.
- Cisco Systems. Academia de networking de Cisco Systems : guía del primer año. 2ª ed. Madrid: Pearson Educación, cop. 2002. ISBN 8420532967.

RESOURCES

Audiovisual material:
- Videos playlist for TI. https://www.youtube.com/playlist?list=PLA45B36BC9C6880CE

Hyperlink:
- Material suplementari de Kurose-Ross. http://www-net.cs.umass.edu/kurose-ross-ppt-6e/