Course guide
820057 - TI - Telecommunications and Internet

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

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

Academic year: 2022  ECTS Credits: 6.0  Languages: English

LECTURER

Coordinating lecturer: Antoni Perez-Poch
Others: Antoni Perez-Poch

PRIOR SKILLS

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 possibilities 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

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
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</tbody>
</table>

Total learning time: 150 h

CONTENTS

Basic concepts

Description:
Chapter 1: History of telecommunications.
Chapter 2: Telecommunications 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 access 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

Specific objectives:
Acquire the basic concepts of communications.

Related activities:
Laboratory sessions 1 and 2
1, 2. Configuration of a local area network. Switches and hubs. Cable building.

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

Full-or-part-time: 20h
Theory classes: 4h
Laboratory classes: 4h
Guided activities: 4h
Self study: 8h
### Local area networks and Wide area Networks.

**Description:**

**Specific objectives:**
Acquire the functioning mechanisms of data networks.  
Be able to design and build an Local Area Network (LAN).

**Related activities:**
Laboratory sessions:  
3, 4 y 5. Network simulations  
6, 7 8. Routers configuration. Internet connexion of a local area network.  
10, 11, 12, 13, 14 y 15. Design of a local area network.

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

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

**Full-or-part-time:** 110h
Theory classes: 22h  
Laboratory classes: 26h  
Guided activities: 26h  
Self study : 36h

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### Wireless data networks.

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

**Specific objectives:**
Acquire the principles of wireless networks.

**Related activities:**
Theory and problems

**Full-or-part-time:** 10h
Theory classes: 2h  
Self study : 8h
Social and economic implications related to these technologies

Description:

Specific objectives:
Be able to debate on the social and economic outcomes of these technologies.

Related activities:
Seminars and article analysis.

Full-or-part-time: 10h
Theory classes: 2h
Self study : 8h

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 conducted in English.

BIBLIOGRAPHY

Basic:

Complementary:

RESOURCES

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

Hyperlink:

Other resources:
Notes and audiovisual material published in Atenea.