820057 - TI - Telecommunications and Internet

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 723 - CS - Department of Computer Science
Academic year: 2019
Degree:
- BACHELOR’S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN ENERGY ENGINEERING (Syllabus 2009). (Teaching unit Optional)
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- BACHELOR’S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional)
- BACHELOR’S DEGREE IN MATERIALS ENGINEERING (Syllabus 2010). (Teaching unit Optional)

ECTS credits: 6  Teaching languages: English

Teaching staff
Coordinator: Antoni Pérez Poch
Others: Antoni Pérez Poch

Opening hours
Timetable: See timetable and Atenea.

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 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>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>30h</th>
<th>20.00%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>30h</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
## Content

### Basic concepts

**Learning time**: 28h 15m  
- Theory classes: 5h  
- Practical classes: 5h  
- Guided activities: 2h  
- Self study: 16h 15m

**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

**Related activities:**  
- Laboratory session 1  

### Local area networks and Wide area Networks.

**Learning 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

**Description:**  

**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.
- **Wireless data networks.**

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

  **Description:**
  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

- **Social and economic implications related to these technologies**

  **Learning time:** 7h
  - Theory classes: 1h
  - Practical classes: 1h
  - Guided activities: 2h
  - Self study: 3h

  **Description:**
  Chapter 10: Social and economic implications related to these technologies.

  **Related activities:**
  Seminars and article analysis.

**Qualification system**

Partial controls: 25%  Exercises: 25%  Final control: 0%
Non presential (Project-based): 25%  Laboratory: 20%  English: 5%

**Regulations for carrying out activities**

Should be written in English.
Bibliography

Basic:


Complementary:


Others resources:

Hyperlink

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

Audiovisual material

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