820057 - TI - Telecommunications and Internet

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 723 - CS - Department of Computer Science
Academic year: 2017
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)
- Bachelor's Degree in Energy Engineering (Syllabus 2009). (Teaching unit Optional)
- 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 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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Hours small group:</td>
<td>30h</td>
<td>20.00%</td>
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<tr>
<td></td>
<td>Guided activities:</td>
<td>0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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</tbody>
</table>
## 820057 - TI - Telecommunications and Internet

### Content

<table>
<thead>
<tr>
<th>- Basic concepts</th>
<th>Learning time: 28h 15m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 5h</td>
</tr>
<tr>
<td></td>
<td>Practical classes: 5h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 2h</td>
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<tr>
<td></td>
<td>Self study: 16h 15m</td>
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</tbody>
</table>

**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

<table>
<thead>
<tr>
<th>- Local area networks and Wide area Networks.</th>
<th>Learning time: 96h 30m</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 7h</td>
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<tr>
<td></td>
<td>Practical classes: 7h</td>
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<tr>
<td></td>
<td>Laboratory classes: 22h 30m</td>
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<tr>
<td></td>
<td>Self study (distance learning): 25h</td>
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<td></td>
<td>Group work (distance learning): 25h</td>
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<tr>
<td></td>
<td>Guided activities: 10h</td>
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</tbody>
</table>

**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