Degree competences to which the subject contributes

1. Understanding advanced concepts of computer science and programming.
2. Ability to analyze, design and construction of databases in the health field.
3. Being able to design and configure a data communication system.
4. Ability to solve problems in the field of biomedical engineering using techniques which involve communication systems and databases.
5. Identifying the basic elements of a local area network.

Prior skills
Basic knowledge of computer programming

Requirements
Having passed the subject of informatics

Learning objectives of the subject

1. Understanding advanced concepts of computer science and programming.
2. Ability to analyze, design and construction of databases in the health field.
3. Being able to design and configure a data communication system.
4. Ability to solve problems in the field of biomedical engineering using techniques which involve communication systems and databases.
5. Identifying the basic elements of a local area network.
### Study load

<table>
<thead>
<tr>
<th></th>
<th>Hours large group:</th>
<th>Hours medium group:</th>
<th>Hours small group:</th>
<th>Guided activities:</th>
<th>Self study:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total learning time:</strong></td>
<td>150h</td>
<td>45h</td>
<td>0h</td>
<td>0h</td>
<td>90h</td>
</tr>
<tr>
<td><strong>%</strong></td>
<td>30.00%</td>
<td>0.00%</td>
<td>10.00%</td>
<td>0.00%</td>
<td>60.00%</td>
</tr>
</tbody>
</table>
### Content

<table>
<thead>
<tr>
<th>(ENG) T1: Introduction to medical informatics</th>
<th>Learning time: 6h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Self study : 4h</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**
Theory lessons based on examples.

**Specific objectives:**
- Knowing the informational requirements in the health sector and understanding how the medical informatics provides solutions.
- Knowing the basic concepts of medical informatics

<table>
<thead>
<tr>
<th>(ENG) T2: Design and management of clinical databases</th>
<th>Learning time: 48h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 15h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Self study : 25h</td>
</tr>
</tbody>
</table>

**Description:**

**Related activities:**
Theory lessons based on examples. Problem-solving sessions and lab work. Application project.

**Specific objectives:**
- Defining what is a database, and its application in the context of medical informatics.
- Applying the design methodology of databases and to be able to make a critical interpretation of solutions in healthcare environment.
- Knowing the main sentences of the structured query language and to be able to use it to obtain information from clinical databases.
## (ENG) T4: Digital communications and computer networks

**Learning time:** 48h  
Theory classes: 16h  
Laboratory classes: 7h  
Self study: 25h

**Description:**  

**Related activities:**  
Theory lessons, problem-solving sessions and lab work. Applied project.

**Specific objectives:**  
- To be able to identify the basic elements of a computer network.  
- To be able to analyze and design a local area network.  
- Knowing to configure the basic intercommunication elements.

## (ENG) T3: Applied project

**Learning time:** 48h  
Theory classes: 12h  
Laboratory classes: 0h  
Self study: 36h

**Description:**  
Set out an applied project. Required documentation. Work in group. Design and implementation of an information and communication system in the healthcare environment.

**Related activities:**  
Work in group. Project presentation.

**Specific objectives:**  
- To be able to design and configure an information and communication system.  
- To learn how to solve biomedical engineering problems that involve databases and communication systems.
Qualification system

Final grade = 0.5 * Exams + 0.1 * Problems + 0.2 * Lab + 0.2 * Other
where Exams is the average of two partial exams (P1 and P2), Problems scores the proposed activities, and the
laboratory includes active learning activities for which the students will make preliminary studies and follow-up
assessment reports including the obtained results. Other qualifications include a project where generic competence will be
developed. The evaluation of the project will follow the following scale:

- The rating of the generic competence of information resources: 25%.
- Quality of content: 75%.

Students who don’t pass the subject during the course may do a re-assessment exam (RA). This exam will contain
conceptual questions and problems about the whole contents of the subject. It will allow to make up 50% of the final
mark, according to the formula max{0.25P1+0.25P2, 0.5RA}.
The students will be able to access the re-assessment test that meets the requirements set by the EEBE in its Assessment
and Permanence Regulations (https://eebe.upc.edu/ca/estudis/normatives-academiques/documents/eebe-normativa-

Regulations for carrying out activities

- The practices are mandatory.
- Repeater students will not receive recognition for any part of the course.
- If some deliverable or some activity is not performed, this will be considered as not scored.

Bibliography

Basic:

9781292024226.
Cerdà Alabern, Llorenç. Xarxes de computadors : conceptes bàsics [on line]. Barcelona: Edicions UPC, 2007Available on:

0387289860.
Harrington, Jan L.. Relational database design and implementation clearly explained [en línia] [on line]. 3rd ed. Boston:
9780123747303.
Silberschatz, A. ... [et al.]. Fundamentos de bases de datos [on line]. 5a ed. Madrid [etc.]: McGraw-Hill, cop. 2006Available