820031 - SICS - Information Systems and Communications for Health Services

Coordinating unit: 295 - EEBE - Barcelona East School of Engineering
Teaching unit: 707 - ESAII - Department of Automatic Control
Academic year: 2019
Degree: BACHELOR'S DEGREE IN BIOMEDICAL ENGINEERING (Syllabus 2009). (Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: Jordi Solà Soler
Others: Primer quadrimestre:
PEDRO GOMIS ROMAN - M11, M12, M13, M14
JORDI SOLA SOLER - M11, M12, M13, M14

Opening hours

Timetable: To check the bulletin board

Prior skills

Basic knowledge of computer programming

Requirements

Having passed the subject of informatics

Degree competences to which the subject contributes

Specific:
2. Identify, understand and apply the principles of information and communication systems to healthcare.

Transversal:
1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

Teaching methodology

The course has two hours per week of theory (large group), 1 hour weekly of problems (large group) and each two weeks two lab hours (small group). In theory class, it will be combined theoretical expositions and exhibitions examples. Problem classes will be participatory and these will be focused on problem solving. In the lab, students must follow the conditions outlined by the teacher. In addition, it is considered hours of self-directed learning focused on a project, in which each working group must work the generic competence making an efficient use of information resources.

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>Total learning time: 150h</th>
<th>Hours large group: 45h</th>
<th>30.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
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<tr>
<td></td>
<td>Hours small group: 15h</td>
<td>10.00%</td>
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<td></td>
<td>Guided activities: 0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Self study: 90h</td>
<td>60.00%</td>
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# Content

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

**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

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<th>Content</th>
<th>Learning time: 48h</th>
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| **(ENG) T2: Design and management of clinical databases** | Theory classes: 15h  
Laboratory classes: 8h  
Self study : 25h |

**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**

**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.

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

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**ENG T3: Applied project**

**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.

**Learning time:**
- Theory classes: 12h
- Laboratory classes: 0h
- Self study: 36h
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-avaluacio-i-permanencia-18-19-aprovat-je-2018-06-13.pdf)

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:

Complementary: