

Academic Year: ( 2024 / 2025 )

Review date: 26-04-2024

Department assigned to the subject: Bioengineering Department

Coordinating teacher: DESCO MENENDEZ, MANUEL

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 1

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

The student should have completed the following subjects of the first and second quarter of the first year:

- Medical imaging technologies
- Analytical and monitoring systems
- Diagnosis and therapy systems

**OBJECTIVES**

This subject qualifies student to create plan the installation and commissioning of the most relevant electromedical systems. Students will also be capable elaborate the maintenance and supply programmes. To do this, he will learn to draw up a plan for the renewal and acquisition of new electromedical systems and equipment, taking into account both the technical requirements and the cost of the different alternatives.

**COMPETENCES THAT THE STUDENT ACQUIRES WITH THIS MATTER**

CB6 Possess and understand knowledge that provides a base or opportunity to be original in the development and / or application of ideas

CB7 That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study

CB8 That students are able to integrate knowledge and face the complexity of formulating judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments

CB9 That students know how to communicate their conclusions and the knowledge and ultimate reasons that sustain them to specialized and non-specialized audiences in a clear and unambiguous way

CB10 That students have the learning skills that allow them to continue studying in a way that will be largely autonomous.

CG3 Ability to design and carry out technological projects in the field of the application of engineering to medicine, as well as to analyze and interpret their results.

CG4 Ability to evaluate medical equipment and instrumentation in complex multidisciplinary environments, assessing the needs of different clinical users and offering objective measures for decision making.

CE1 Ability to evaluate algorithms and data processing techniques in complex multidisciplinary environments, assessing the needs of different clinical users and offering objective measures for decision making.

CE3 Ability to apply advanced techniques of health technology management, both in technical and economic aspects, and including the acquisition and maintenance thereof.

CE11 Ability to plan, manage and supervise the installation and maintenance of non-implantable active medical devices in electromedicine systems and their associated facilities, under quality criteria, in safety conditions and complying with current regulations.

CE13 Ability to plan, manage and supervise hospital infrastructures under quality criteria, in safety conditions and complying with current regulations.

**LEARNING RESULTS THAT THE STUDENT ACQUIRES**

In overcoming this subject, students should be able to:

- Characterize the clinical electromedical service of a hospital/health institution and its relationship with the technical assistance services, recognizing the importance and repercussion of its proper management.
- Prepare a plan for the renewal and acquisition of new equipment of clinical electromedicine, analyzing the clinical needs of the center and the obsolescence and state of the available technology park.
- Define the technical characteristics of the new equipment to be acquired, considering the compatibility and connectivity with other facilities and infrastructures of the health center and the current technological innovation.
- Analyze the cost of the different purchase alternatives of equipment, breaking down the corresponding items and using reference prices.
- Elaborate an inventory and learn how to take care of its management.

## DESCRIPTION OF CONTENTS: PROGRAMME

The content of the subject is:

- Asset management
  - o Life cycle of the electromedical equipment
  - o Costs analysis
  - o Inventory
- Acquisition of new equipment
  - o Renovation plan and acquisition plan for new electromedical systems and equipment
- Planning and management of electromedical systems

## LEARNING ACTIVITIES AND METHODOLOGY

### LEARNING ACTIVITIES

- Theoretical class
- Theoretical-practical class
- Practical seminars
- Tutorials
- Individual and team work

### TEACHING METHODOLOGIES

- Exhibitions in the teacher's class with support of computer and audiovisual media, in which the main concepts of the subject are developed and the bibliography is provided to complement the students' learning.
- Resolution of practical cases, problems, etc. raised by the teacher individually or in groups.
- Exhibition and discussion in class, under the teacher's moderation of topics related to the content of the subject, as well as practical cases.
- Preparation of papers and reports individually or in groups.

## ASSESSMENT SYSTEM

<b>% end-of-term-examination:</b>	50
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	50

Continuous assessment: 50%

- The continuous evaluation will represent 50% of the final score. For this, all the requested works must be submitted and have at least a score of 5.0 out of 10.0 in each of them.
- It will consist of carrying out individual assignments, problems and / or practical activities.
- Participation in class and Aula Global will be taken into account: includes participation during seminars, in the Aula Global forum, attitude in class, exercises in class (to be solved in groups or individually), or other activities.

Final exam: 50%

- The final exam will cover the entire syllabus and will represent 50% of the final score. The minimum score in the final exam to pass the course is 5.0 out of 10.0, regardless of the grade obtained in the continuous assessment.

Extraordinary exam:

- The grade for students who attend any extraordinary exam will be 50% of the extraordinary exam and 50% of the continuous assessment, if available. In case of not presenting continuous evaluation, all the weight of the note will fall on the exam.

ACADEMIC CONDUCT:

**% end-of-term-examination:** 50

**% of continuous assessment (assignments, laboratory, practicals...):** 50

Plagiarism, cheating or other acts of academic dishonesty will be not tolerated. Any infractions whatsoever will result in a failing grade.

#### BASIC BIBLIOGRAPHY

- UNE 209001:2002 IN Guía para la gestión y el mantenimiento de productos sanitarios activos no implantables., ., 2002
- UNE-EN 13269:2007 Guía para la preparación de contratos de mantenimiento, ., 2007
- UNE-EN ISO 10012:2003 Sistemas de gestión de las mediciones, ., 2003
- UNE-EN ISO 10012:2003 ERRATUM - Sistemas de gestión de las mediciones. , ., 2003

#### ADDITIONAL BIBLIOGRAPHY

- UNE 179003:2013 Servicios sanitarios. Gestión de riesgos para la seguridad del paciente., ., 2013
- UNE-EN 13306:2011 Mantenimiento. Terminología del mantenimiento, ., 2011
- UNE-EN 60601-1/A1:1996 Equipos electromédicos. Requisitos generales para la seguridad, ., 1996