

Academic Year: ( 2019 / 2020 )

Review date: 03-05-2019

Department assigned to the subject: Department of Bioengineering and Aerospace Engineering

Coordinating teacher: ABELLA GARCIA, MONICA

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

**STUDENTS ARE EXPECTED TO HAVE COMPLETED**

It is recommended to have passed the subjects Electronic and optical circuits for clinical engineering, Electrotechnical systems in clinical engineering and Mechanical systems in clinical engineering of the 1st semester of the 1st year.

**COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.****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.

CG1 Ability to learn new methods and technologies, based on the mastery of scientific subjects and specialized techniques of Clinical Engineering, as well as to adapt to new situations.

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.

CE2 Ability to understand and use advanced statistical methods for conducting scientific studies, evaluation of equipment from the point of view of effectiveness, accreditation for medical use or study of comparative effects in patients.

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

CE9 Ability to establish a dialogue with doctors to understand complex medical problems and the application of quantitative methods and engineering techniques to their solution.

CE12 Ability to install and maintain hospital infrastructures under quality criteria, in safety conditions and in compliance 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**

To overcome this matter, students should be able to:

Analyze and evaluate hospital facilities through the development of conceptual designs, selection of elements and application components in them.

Know the legal and regulatory framework applicable to hospital facilities in order to manage, supervise and analyze the assembly of facilities, systems and equipment.

Identify and understand the location of facilities and systems to specify, plan, manage and supervise

assembly processes, diagnosis procedures, planning and maintenance management and disassembly of them. Evaluate the state of the technological park, relating it to the care and clinical needs and economic resources to prepare a renovation and acquisition plan. Plan and manage the maintenance of facilities, systems and equipment, optimizing execution times, material and human resources. Elaborate and manage all the documentation derived from the hospital facilities and their systems, considering the current legislation. Evaluate situations of prevention of labor risks and environmental protection, proposing and applying personal and collective prevention measures, in accordance with the applicable regulations. Carry out the monitoring and supervision of the hospital facilities, verifying that the conditions of quality and safety are met in accordance with the technical documentation and current regulations. Prepare and manage the documentation derived from maintenance, assembly processes, planning, management and supervision of hospital facilities. Manage and monitor costs, interventions, safety tests, operation and waste management related to the maintenance of hospital facilities. Characterize the different elements that intervene in the process of creating a health information system, relating them to the key factors of the healthcare activity.

#### DESCRIPTION OF CONTENTS: PROGRAMME

1. Hospital architecture
2. Electrical installations
3. High-risk electrical installations in operating rooms
4. Air conditioning
5. Medicinal gases
6. Sanitary water
7. Sterilization
8. Laminar flow installations
9. Energy efficiency
10. Industrial cold in a hospital
11. Elevation systems

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

#### BASIC BIBLIOGRAPHY

- Ernst Neufert Arte de proyectar en arquitectura, Gustavo Gili, 2013