SUBJECT TEACHING GUIDE

G1484 - Fundamentals of Biomedical Engineering

Degree in Telecommunication Technologies Engineering

Academic year 2016-2017

1. IDENTIFYING DATA					
Degree	Degree in Telecommunication Technologies Engineering			Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Speciality Optional Subjects				
Course unit title and code	G1484 - Fundamentals of Biomedical Engineering				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. TECNOLOGIA ELECTRONICA E INGENIERIA DE SISTEMAS Y AUTOMATICA
Name of lecturer	JOSE LUIS ARCE DIEGO
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Other lecturers	JUAN MARIA PEREZ ORIA JESUS ANTONIO ARCE HERNANDO FELIX FANJUL VELEZ

3.1 LEARNING OUTCOMES
- Knowledge of the field of biomedical engineering and its main applications
- Knowledge of the major ethical issues involved in biomedical applications
- Knowledge of basic biomedical signals that can be used in medical device applications
- Ability to design basic medical instrumentation systems
- Knowledge of most relevant instrumentation systems
- Knowledge of the principles of current medical imaging
- Knowledge of advanced principles of medical imaging
- Ability to select a priori the appropriate technique for a specific application
- Knowledge of optical sources applications in treatment and diagnosis of diseases
- Ability to select a priori the appropriate optical source for an application.
- Knowledge of ICT applications in the medical field
- Ability to design basic telemedicine systems

4. OBJECTIVES
To know the applications of biomedical engineering To consider ethical issues in biomedical applications To know the most significant biosignals To design basic biomedical instrumentation systems To know the principles of current medical imaging To understand the benefits and limitations of medical imaging equipment To know the applications of optical and medical diagnosis to treatment To know how to choose the basic features of a medical imaging or optical equipment To know the main applications of telemedicine To design basic systems telemedicine

6. COURSE ORGANIZATION	
CONTENTS	
1	THEMATIC AREA 1: Introduction 1. Biomedical Engineering: general and ethical issues.
2	THEMATIC AREA 2: Bioinstrumentation 2. Biomedical Signals 3. Biomedical instrumentation systems
3	THEMATIC AREA 3: Diagnosis and Treatment Techniques 4. Medical imaging 5. Lasers for medical applications
4	THEMATIC AREA 4: ICTs in the clinical setting 6. Telecommunications in the clinical setting

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Reports of laboratory works (30%).	Laboratory evaluation	No	No	30,00
The remaining 30% will be evaluated based on a written final test before the exam period.	Written exam	Yes	Yes	30,00
The evaluation of the subject is presented as continuous assessment with a final test. Ongoing evaluation consists of proposed classroom work for delivery in groups, with a weight of 40%,	Work	No	Yes	40,00
TOTAL				100,00

Observations

Attendance at lab is mandatory, as well as delivery of reports of laboratory works. Non-attendance or non-delivery will lead to fail the subject. Failure to deliver the proposed classroom work will lead to a score of 0 on that part. In order to pass the course, the sum of scores should be at least 5 points.

Observations for part-time students

Part-time students who are not eligible for the continuous assessment will get their final mark by the laboratory works, with a weight of 50% and compulsory attendance, and the final written exam, with a weight of 50%.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

J.D. Enderle, S.M. Blanchard, J.D. Bronzino, Introduction to Biomedical Engineering, Ed. Academic Press, 2005.
A.A. Bharath, Introductory Medical Imaging, Ed. Morgan&Claypool, 2009.
Ronald W. Waynant, Lasers in Medicine, Ed. CRC Press, 2002.