ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Α .Δ Ι .Π .
ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ & ΠΙΣΤΟΠΟΙΗΣΗΣ
ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ
ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC
H .Q .A .
HELLENIC QUALITY ASSURANCE
AND ACCREDITATION AGENCY

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ ΚΑΙ ΘΡΑΚΗΣ
ΜΟΝΑΔΑ ΔΙΑΣΦΑΛΙΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΤΕΙ ΑΜΘ

Quality Assurance in Higher Education
Course Data Collection Form

ΤΕΧΝΟΛΟΓΙΚΟ ΕΚΠΑΙΔΕΥΤΙΚΟ ΙΔΡΥΜΑ
ΑΝΑΤΟΛΙΚΗΣ ΜΑΚΕΔΟΝΙΑΣ & ΘΡΑΚΗΣ
ΑΓΙΟΣ ΛΟΥΚΑΣ,
65404 ΚΑΒΑΛΑ

EASTERN MACEDONIA AND THRACE
INSTITUTE OF TECHNOLOGY
AGIOS LOUKAS
65404 KAVALA

COURSE OUTLINE

(1) GENERAL

NAME	D. Bandekas		
SCHOOL	of Technological Applications		
ACADEMIC UNIT	Department of Electrical Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	GN5	**SEMESTER**	**3rd**
COURSE TITLE	Introduction to Bioengineering		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Exercises	2 Th.	4
Laboratory	2 L	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	*Specialized general Knowledge*
PREREQUISITE COURSES:	No
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek – English
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	http://eclass.teikav.edu.gr/ED135/

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course is an introduction on the subject of biomechanics with a focus on applications for the electrical engineer.
The aim of the course of Biomechanics is the understanding and study of the mechanical properties that govern the functioning of the human body and the use of electric and electronic systems for such measurement. Also, the purpose of the course is the use of specialized techniques for analyzing tissue and bone nanostructure for a better understanding of biomechanics.

Finally, the aim of the course lies in the linking of science in Electrical Engineering in Medicine to solve problems faced by living organisms.

Upon successful completion of this course the student / her will be able to:
• To have understood the basic concepts on the bio - signals and can analyze them
• To be able to distinguish between different types of sensors and being able to use them
• Be able to make design an electric - electronic device for analyzing biomechanical properties
• Be able to address a problem from the level up of nanoscale and macroscale.
• Be aware of all the possible technical equipment that can be used to solve bio - problems.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Others…
…….

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working independently
Working in an interdisciplinary environment
Team work
Production of free, creative and inductive thinking

(3) SYLLABUS

I. Instrumentation - (Infrastructure fot Characterization of Nanostructures)
II. Sensors - Classification and applications
III. Analysis and signal processing
IV. signal amplification
V. Photometric, thermal, bio, biochemical sensors and strain gauges.
VI. designer appliances
VII. Structure and function of human body
VIII. Tissue and bone nanostructure
IX. Bone mechanical properties (using sensors)
X. medical equipment Operating Analysis

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face (in the classroom)
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use slides, website of the course with supporting and auxiliary material Use of special software for analysis of bio systems
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	

Activity	*Semester workload*
Lectures	20
Laboratory practice	10
Project Writing	*35*
Independent study	35
Course total	10

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	Written work (50%), Final written examination (50%).

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

[1]. Basic Bioengineering of human motion 2007 Hamill Joseph,Knutzen Kathleen M.ISBN
[2]. The Biomedical Engineering Handbook, Third Edition - 3 Volume Set, Joseph D. Bronzino, Trinity College, Hartford, Connecticut, USA; Hardback - Published Apr 28, 2006
[3]. Willis J.Tompkins, Biomedical Digital signal processing, Prentice Hall of India Pvt. Litd., 2000 Biomedical Signal Analysis A case study approach by Rangaraj M.Rangayyan, John Wiley publications.
[4]. http://www.mdpi.com/journal/bioengineering
[5]. Journal of Bioscience and Bioengineering (http://www.journals.elsevier.com/journal-of-bioscience-and-bioengineering/)