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 and surname of lecturer	Jacob Fantidis		
SCHOOL	of Technological Applications		
ACADEMIC UNIT	Department of Electrical Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΓΝ4	**SEMESTER**	4th
COURSE TITLE	Modelling of the system		

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	3 Th.	4,5
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*	Specialised general knowledge, skills development
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	http://eclass.teikav.edu.gr/ED146/

(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*

Purpose and aim of the course is to provide students with the relevant theoretical background in mathematical modeling-simulation and control systems with a focus in energy systems· introduction to basic concepts and principles of Modeling Systems and Simulation. Additional aim is the introduction to the model design and simulation studies.
The course includes: Basic modeling and simulation principles. Systems, models and simulation. Continuous and discrete-time systems. Math tools. Mathematical methods. Automatic control systems. Mathematical modeling and control of gas turbines. Mathematical modeling and control water turbines. Mathematical modeling and control of steam turbines. Mathematical modeling and control of diesel engines. Mathematical modeling and control of wind turbines. Mathematical modeling and control of other systems. Methods of integration.
Upon successful completion of this course the student will be able to:
• Understand the distinction between modeling and simulation
• Know the available techniques for modeling and simulations
• Identify the capabilities and limitations of the above and select the appropriate
• Perform simulations of the system
• To plan new systems using modeling techniques
• Evaluate their behavior using simulation technologies
• Do modeling of energy systems

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

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Decision-making
Team work
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management

(3) SYLLABUS

I. Introduction to modeling: types and kinds of models, technological balance of existing

knowledge and modeling tools.
II. Introduction to simulation systems: objectives, tools, capabilities, limitations, technologies
III. Modeling of power systems.
Case study: renewable energy (hydro, wind, photovoltaic), diesel engines, fuel cells, supercapacitors, synchronous - asynchronous motors, electric car, transmission lines).

(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.
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	39
Project	50
Independent study	23.5
Course total	112.5

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.*	Theoretical Course Final written examination (50%) that combines theoretical questions covering all the sections of the course. Written work (30%) Public presentation (20%)

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. Technical simulations «Roumeliotis Manos, Souravlas Stauros, 2011, Tziolas.
2. Simulations and applications, Sfakianakis Michael, 2001, S. Patakis
3. Discrete Event Simulation: A First Course", Leemis and Park Pearson-Prentice Hall, 2006.
4. Simulation Modeling and Analysis, . A.M. Law, W.D. Kelton, McGraw Hill
5. Simulation with Arena» D. Kelton, , McGraw Hill
6. Theory of Modeling and Simulation, B. Zeigler, H. Praehofer, T. Kim, Academic Press
7. Simulation Model Design and Execution, P. Fishwick Prentice Hall