COURSE OUTLINE

(1) GENERAL

SCHOOL	SCIENCES		
ACADEMIC UNIT	Physics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**52**	**SEMESTER**	**5**
COURSE TITLE	Classical Electrodynamics I		

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**
	4	7
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*	Special Background
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	http://ecourse.uoi.gr/course/view.php?id=1353

(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 provides the student the advanced knowledge required to understand the principles and phenomena of electrostatics and magnetostatics as well as mathematical techniques which are necessary to solve related problems.
Specifically after the successful completion of the course the student will be able to
1. interpret and draw qualitative conclusions for static electromagnetic phenomena based on a small number of laws and concepts (Maxwell laws)
2 use mathematical techniques to calculates analytically electric/magnetic fields for static charge/current distributions with possible presence of pipelines and/or linear dielectric / magnetic materials.
3. formulate electrostatic problems with the help of scalar/vector potential and the appropriate boundary conditions

using special mathematical methods to solve them
4. calculate approximate the electric / magnetic fields generated by discrete or continuous charge/ urrent distributions using the multipole expansion.

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, analysis and synthesis of data and information, using appropriate techniques.
Autonomous work.
Promotion of free, creative and inductive thinking.

(3) SYLLABUS

Maxwell's equations. Electrostatic field and potential.
Energy in electrostatics. General capacitance calculation methods.
Electrostatic fields in matter. Magnetostatic field and vector potential.
Magnetostatic fields in matter.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face teaching
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	**Use the asynchronous system Moodle tele for placing notes, practical exercises and communication with students**
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
Tutorials	13
Reference Study	90
Free study	30
Exams	3
Course total	***175***

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 exams at the end of the course, relating to 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.*	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1. Introduction to Electrodynamics, D. Griffiths, University of Crete (Greek translation) (2004).
- *Classical Electrodynamics, JD Vergados Simeon Publications (2002). In Greek*
- *Classical Electrodynamics, Second Edition, Hans C. Ohanian, Laxmi Publication (2006).*
- *Electromagnetism, G. L. Pollack, D. R. Stump, Pearson (2005).*
- *Classical Electrodynamics, 3rd edition, J. D. Jackson, Willey (1998).*
- *Classical Electromagnetic Theory, 2nd edition, J. Venderlinde, Kluwer Academic Publishers (2004).*