COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF PHYSICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**35**	**SEMESTER**	**3**
COURSE TITLE	Laboratory Courses in Electromagetism		

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	6
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*	General background
PREREQUISITE COURSES:	Electromagnetism [21]
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (Greek & English)
COURSE WEBSITE (URL)	http://ecourse.uoi.gr/enrol/index.php?id=74

(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 principal aim of this course is the student to develop a deeper understanding of the Electromagnetism by performing a series of laboratory projects. Upon successful completion of this course the student will be able to:

- to design and implement circuits and measurements of different disciplines in the field of Electromagnetism
- understand and feel familiar with the most important phenomena of the Electromagnetism either in DC or AC current circuits
- handle the specific instrumentation for measurements and circuit characterization in the field of Electromagnetism (DC-AC power sources, oscilloscopes, digital and analog multimeter, adjustable resistors, capacitors, dimmers, coils, etc)
- work with specialized software for circuit simulation (e.g. Multisim, QUCS)
- understand the operation principles of Digitization and Data Acquisition
- understand the common practices in data analysis and data representation methods
- present in a comprehensive way the experimental setup, the physics case, the results and

the conclusions of his/her work by writing an extended report every week.

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…* *…….*

Team work, analysis and synthesis of data and information, with the use of the necessary technology, Decision-making

(3) SYLLABUS

Measurements with a digital multimeter, Voltage divider, Moving coil instruments, Simulation of electrical circuits using the Multisim software, Thevenin's theorem, Norton's theorem, Measurements with an oscilloscope, Frequency filter circuits (RC/RL), Resonance in an RCL circuit, Measurements of the magnetic field of a solenoid, Biot-Savart law, Capacitor

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of the on-line web page e-course system for scheduling the class, communicate with students, etc • In the theoretical classes the tutors are making use of digital projectors • A significant part of the laboratory projects is realized by means of PC either for Data Acquisition purposes or for circuit simulation.
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*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice*	The students are evaluated by means of the final laboratory work evaluation during the exam period at the end of the semester as well as from their performance during the laboratory courses.

Activity	***Semester workload***
Lectures	11
Laboratory practice	33
Study of bibliography	44
Essay writing	60
Exams	2
Course total	***150***

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.*	The evaluation criteria are: • 40% Final Exams: laboratory work evaluation, oral examination and report evaluation • 60% from the student performance during laboratory courses (evaluation of the report 70%, tests and oral examination 30%) A prerequisite for participating in the Written Examination is a passing grade in the Laboratory Performance. The course is successfully completed when the grade in the final Written - Practical Examination is also passing.

(5) ATTACHED BIBLIOGRAPHY

- Εργαστηριακές Ασκήσεις Ηλεκτρισμού και Μαγνητισμού, Κ. Ιωαννίδης
- Ηλεκτρικά Κυκλώματα, J. A. Edminister
- Ηλεκτρικά Κυκλώματα, Γεώργιος Χατζαράκης
- Πανεπιστημιακή Φυσική – Τόμος Β, H.D. Young, R.A. Freedman
- Φυσική για επιστήμονες και μηχανικούς, R.A. Serway, J.W. Jewett