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 ELECTROMAGNETISM		

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*	Specialised general knowledge/skills development
PREREQUISITE COURSES:	ELECTROMAGNETISM
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
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*

This is a laboratory course that the student has the opportunity to get hands-on experience with basic laboratory instrumentation. In this way a deeper understanding on the concepts and laws of Electromagnetism can be achieved. Specifically, after the successful completion of the course the student:

- Will be able to design an implement simple electronic circuits
- He/She will be familiar with the basic phenomena of the Electromagnetism for DC and AC currents
- He/She will be familiar with the corresponding instrumentation (DC/AC power supplies, digital-analogue multimeter, oscilloscopes, resistors, capacitors, coils, etc
- He/She will be able to use circuit simulation software (e.g. Multisim)
- He/She will be able to perform data analysis using the appropriate statistical analysis techniques and software
- He/She will be able to report on the performed laboratory work in a detailed and accurate way

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, Working independently, Search for, analysis and synthesis of data and information, with the use of the necessary technology, Decision-making	

(3) SYLLABUS

Experiments in electromagnetism: electric current, resistance measurement, electromotive force, electrical power, ohmmeter, galvanometer. Zero measurement methods and bridges. Potentiometers. Magnetic field, induction. Oscilloscope. Transition phenomena. Alternating current. RC, RL, RCL circuits. Impedance. Frequency filters.

(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*	• The e-course platform is extensively used, for communication with the students (class time-table, grades, announcements, class regulations, etc) • The theoretical class is performed by using a dedicated projectors for better visualization of the material • Part of the laboratory courses and exercises are performed using personal computers and specialized software
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	11
Laboratory practice	33
Study and analysis of bibliography	60
Writing of reports	2
Exams	
Course total	***150***

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.*	Performance during laboratory courses (60%) • a small exam paper in each class (30%) • reports on the laboratory work, data analysis (70%) Written and Practical examination at the end of the course that includes (40%): • Theoretical knowledge questions • Practical examination The student has the right to participate to the final examination of the course only if successfully perform the laboratory courses. Overall, the class is successfully evaluated when the student achieves grade higher that 5/10 during the final written and practical examination.

(5) ATTACHED BIBLIOGRAPHY

- Εργαστηριακές Ασκήσεις Ηλεκτρισμού και Μαγνητισμού, Κ. Ιωαννίδης
- Joseph A. Edminister, ISBN 960-7610-09-1, ISBN-13 978-960-7610-09-6
- D. Halliday, R. Resnick, R. Walker, Φυσική, Τ.2, ISBN: 978-960-01-1594-9, Gutenberg, Τυποθύτω Γ. Δαρδανόσ, 2013, Αθήνα
- Hugh, D. Young, R.A. Freedman, Μετ. Από ομάδα Πανεπιστημιακών, Πανεπιστημιακή Φυσική και Σύγχρονη Φυσική, Τόμος Β, (Ηλεκτρομαγνητισμός-Οπτική) 2η Ελληνική Έκδοση, ISBN 978-960-02-2473-3, Παπαζήση ΑΕΒΕ, 2010, Αθήνα
- *R.A. Serway, J.W.Jewett, Φυσική για Επιστήμονες και Μηχανικούς (Ηλεκτρισμός και Μαγνητισμός, Φως και Οπτική, Σύγχρονη Φυσική, 8η Αμερικάνικη Έκδοση ISBN 978- 960-461-509-4, Κλειδάριθμος, 2013, Αθήνα.*