COURSE OUTLINE

(1) GENERAL

SCHOOL	SCIENCE		
ACADEMIC UNIT	DEPARTMENT OF PHYSICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	44	**SEMESTER**	4
COURSE TITLE	LABORATORY COURSES IN WAVE PHYSICS AND OPTICS		

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**
	5	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*	Skills development
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://ecourse.uoi.gr/course/view.php?id=1574

(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 laboratory course offers the student, through practical training, the consolidation, deeper understanding and enrichment of the theoretical knowledge related to Optics and wave phenomena in general. After the successful completion of the course, the student will have developed the necessary skills to be able to:

- recognize the basic wave phenomena of reflection, refraction, convergence, diffraction and polarization.
- develop simple optical devices and apply simple experimental methods in order to measure basic wave quantities (e.g. wavelength) as well as quantities related to them (e.g. refractive index).
- apply the established practices used in the analysis of experimental measurements, with an emphasis on interpolating curves from the experimental points (both in the simplest case of straight lines and more complex ones), creating various types of graphs and calculating the errors of the extracted quantities.
- to present clearly and precisely, in the context of the report that he must deliver weekly, the experimental set-up, the measurements, their analysis and the conclusions derived from it.

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

Reflection & refraction of light (flat block, prism, determination of refractive indices of opaque solids and liquids).

Thin lenses (converging and diverging lenses, determination of focal distance).

Interference and diffraction of light (single slit, Babinet principle, double slit, aperture, grid, grating).

Polarization of light (linear polarizers, Brewster angle, λ/2 and λ/4 birefringent waveplates).

Optical Spectroscope (calibration and resolution of prism and grating spectroscope).

Acoustics of ultrasounds (spectral distribution of emitter-receiver resonance, determination of wavelength and speed of ultrasounds, standing waves).

Optics of microwaves (intensity, refraction, polarization and diffraction of microwaves in crystals, determination of wavelength and speed of microwaves, Michelson and Fabry-Perrot interferometers).

(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 ICT in teaching and communication with students. • Two laboratory exercises are fully carried out with the exclusive use of computers (equipment and software for taking and analyzing measurements). • The University's asynchronous distance learning **ecourse** system is used to provide notes, exercises, assignments 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.*	

Activity	***Semester workload***
Lectures (theory)	10
Laboratory practice	40
Study and analysis of bibliography	48
Essay writing	50
Exams	2

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		
	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.*	Laboratory work (60%) • Short-answer questions during the execution of each exercise. • Essay/report. Written exams (40%) at the end of the course which includes: • Short-answer questions on theory • Essay/report on a laboratory exercise (analysis of a part of a laboratory exercise from those taught).	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Σημειώσεις του Εργαστηρίου (περιλαμβάνουν στοιχεία θεωρίας και περιγραφή της πειραματικής διάταξης και διαδικασίας καθώς και της διαδικασίας ανάλυσης των μετρήσεων για κάθε εργαστηριακή άσκηση), γραμμένες από διδάσκοντες του μαθήματος.
2. Μαθήματα Οπτικής, Γ. Ασημέλη, Εκδόσεις Σύγχρονη Γνώση (Β' έκδοση, 2007).
3. Οπτική, E. Hecht, ΕΣΠΙ Εκδοτική, (Schaum's Outline Series · 8) (1979)