COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
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*	Specialised general knowledge, skills development
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (Greek)
COURSE WEBSITE (URL)	https://alpha.physics.uoi.gr/optlab/

(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 offers the students a practical approach and consequently a deeper understanding of the theory of Optics and waves mechanics in general. Upon successful completion of this course the student will be able to:

- Infer and explain the fundamental phenomena of reflection, refraction, interference, diffraction and polarization.
- Develop simple optical setups and experimental approaches to measure physical quantities of light (e.g. the wavelength).
- Determine the correct physical quantities from the sets of the experimental measurements, based on data reduction and error analysis.

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
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

Working in an international environment *Working in an interdisciplinary environment* *Production of new research ideas*	*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**
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	10
Laboratory practice	40
Study of bibliography	48
Essay writing	50
exams	2
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 • essay/report Written exams (40%) • short-answer questions on theory • essay/report on a laboratory exercise

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- "Σημειώσεις Εργαστηρίου Κυμάνσεων και Οπτικής" Σημειώσεις διδασκόντων.
- "Μαθήματα Οπτικής", Γ. Ασημέλη, Εκδόσεις Σύγχρονη Γνώση, (Β' έκδοση, Σεπτέμβριος 2007).
- Οπτική, E. Hecht, ΕΣΠΙ Εκδοτική (Schaum's Outline Series · 8) (1979)