COURSE OUTLINE

1. GENERAL

SCHOOL	OF SCIENCES		
DEPARTMENT	OF PHYSICS		
LEVEL OF STUDIES	Level 6		
COURSE CODE	SSE803	**SEMESTER**	8ο
COURSE TITLE	SELECT ISSUES IN OPTICS		

TEACHING ACTIVITIES *If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
LECTURES	3	6
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	Scientific Area (Special Background)
PREREQUISITES:	-
TEACHING & EXAMINATION LANGUAGE:	GREEK
COURSE OFFERED TO ERASMUS STUDENTS:	NO
COURSE URL:	https://physics.duth.gr/?page_id=6876

2. LEARNING OUTCOMES

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The purpose of this course is to provide knowledge of the operating principles of lasers, optical fibers, the phenomenon of chromatic polarization, the polarizing microscope, nonlinear optical phenomena, and holography.

- Upon successful completion of the course, the student will be able to:
- Understand the operating principles and types of lasers.
- Understand how optical fibers work and their applications.
- Understand the phenomenon of chromatic polarization in conjunction with the polarizing microscope.
- Understand the phenomena of nonlinear optics and their technological applications.
- Understand the principles of holography.
- Interpret phenomena observed in everyday life.
- Collaborate effectively with fellow students to solve problems related to the course.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,	*Project design and management*
ICT Use	*Equity and Inclusion*
Adaptation to new situations	*Respect for the natural environment*
Decision making	*Sustainability*
Autonomous work	*Demonstration of social, professional and moral responsibility and sensitivity to gender issues*
Teamwork	*Critical thinking*

Working in an international environment *Promoting free, creative and inductive reasoning* *Working in an interdisciplinary environment* *Production of new research ideas*
The course aims to develop the following competencies: • Search, analysis, and synthesis of data and information using the necessary technologies. • Decision-making. • Critical thinking and self-evaluation. • Promotion of free, creative, and inductive thinking.

3. COURSE CONTENT

Operating principles of lasers. Population inversion. Types of lasers.Optical fibers. Chromatic polarization.Polarizing microscope.Nonlinear optics (Kerr and Pockels effects). Holography.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Face to Face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Use of ICT in Teaching Use of ICT in Communication with students
TEACHING ORGANIZATION *The ways and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.* *The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.*	*Activity* / *Workload/semester* Lectures 120 Self study 30 Course total (25 hours / ECTS) **150**
STUDENT EVALUATION *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report,Clinical examination of a patient,Artistic interpretation, Other/Others* *Please indicate all relevant information about the course assessment and how students are informed*	**Student Assessment Languages** Greek **Methods (Formative or Concluding)** Concluding **Student Assessment Methods** — **Percentage** Written Exam with Problem Solving — 100

5. SUGGESTED BIBLIOGRAPHY

- **Laser – Physics and Technology**, Persephone P., Arakynthos
- **Introduction to Quantum Optics and Lasers**, Ves S., Giachoudi
- **Optics: Basic Principles and Applications**, Eugene Hecht (Scientific Editor: Sotiris Ves), 1st Edition, Gutenberg, 2018, ISBN: 9789600119558 [Eudoxus Code: 77111969]