

COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH & CARE SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
DIVISION	OPTICS AND OPTOMETRY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	6041	SEMESTER	6 th
COURSE TITLE	LASER APPLICATIONS IN OPTOMETRY		
INDEPENDENT TEACHING ACTIVITIES <i>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</i>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	4
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialty Module		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes <i>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</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>The aim of the course is for students to understand the principles and use of LASER's in daily practice in his professional career.</p> <p>Upon successful completion of the course the student will be able to:</p> <ul style="list-style-type: none"> • To know and understand the principles and applications of LASERs • To know the different types of LASERs and their properties. • Understand issues and practices of using lasers in optometry and ophthalmology.

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...
.....*

- Working independently
- Team work

(3) SYLLABUS

- Emission (spontaneous and stimulated) and absorption of radiation
- Basic principles of operation of LASERs. Population inversion - radiation amplification, gain, Oscillation modes
- Gas lasers, solid state lasers, semiconductor lasers
- Excimer LASER.
- Safety of LASERs. Classification and applications. Medical effect on tissues - technical data of medical applications
- Diagnostic instruments based on lasers (confocal ophthalmoscope, polarimeter)
- LCI, optical coherence tomography (OCT)
- Use of lasers in eye treatment (systems based on photochemical interactions, photothermal interactions, photo-ablation, photodestruction with nanosecond pulses, plasma and femtosecond pulses)

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	In class	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	e-class	
TEACHING METHODS <i>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</i>	Activity	Semester workload
	Lectures	39
	Study	51
	Course total	90
STUDENT PERFORMANCE EVALUATION <i>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.</i>	written final exam (100%)	

(5) ATTACHED BIBLIOGRAPHY

<p>- Suggested bibliography:</p> <p><i>In Greek</i></p> <ol style="list-style-type: none"> <i>Visual Optics, Drakopoulos Panos and George Asimellis, pp 440, Syghroni Gnosi 2014</i> <i>Geometrical Optics, Asimellis George, Vamvakas Ioannis, Panos Drakopoulos, pp281, Syghroni Gnosi, 2012</i> <i>Visual Optical Instruments, Drakopoulos Panos and George Asimellis, pp 256, Syghroni Gnosi, 2011</i> <i>Applied Optics, Zevgolis D., 3rd edition, Tsiola Edit, pp696, 2016.</i> <i>Medical Lasers, Science and clinical applications, Carruth JA, McKenzie A., pp 428, S. Athanasopoulos Publ, 1994</i> <p><i>English</i></p>

1. *Optics*, Hecht E., Addison Wesley, 4th Edition, 2001
2. *The light measurement Handbook*, Ryer A., International light, 1997
3. *Optical devices in Ophthalmology and Optometry*, M. Kaschke, K. Donnerhacke, M.S. Rill, pp625, Wiley-VCH, 2014
4. *Lasers: theory and practice* / John Hawkes, Ian Latimer New York : PrenticeHall, 1995
5. *Introduction to lasers and their applications* / DC. O'Shea, W. Callen, and WiT. Rhodes, Addison-Wesley Pub. Co., 1977
6. *Therapeutic lasers: theory and practice* / G. Baxter, C Diamantopoulos, S O'Kane, T. D Shields, Churchill Livingstone, 1994
7. *Laser surgery in ophthalmology: practical applicalications* / edited by T A. Weingeist, Appleton & Lange, 1992
8. *UV lasers : effects and applications in materials science* / W.W. Duley Cambridge University Press, 1996
9. *Excimer lasers in ophthalmology : principles and practice* /. McGhee, Charles N. J. London : Dunitz, 1997
10. *Step by Step Laser in Ophthalmology*, Bikas Bhattacharyya, pp247, Jaypee Bros Medical Publishers, 2009