COURSE OUTLINE

(1) GENERAL

SCHOOL	HEALTH & CARE SCIENCES		
ACADEMIC UNIT	BIOMEDICAL SCIENCES		
DIVISION	OPTICS AND OPTOMETRY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	4011-4012	**SEMESTER**	4th
COURSE TITLE	OPTICAL AND OPTOMETRIC INSTRUMENTS		

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 TEACHIN GHOURS**	**CREDITS**
LECTURES + LABORATORY EXERCISES	4Lec+2Lab	7
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*	Special background
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	

(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 material aims at understanding the principles of operation of the basic optical instruments, for use in daily practice in his professional career.

Upon successful completion of the course the student three will be able to:

• To know the principles of operation of optical imaging instruments for the understanding of technological and scientific research methods in their subject.

• Be familiar with the use of various optical instruments

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**

- Light propagation, wavefronts, rays, vergence, diopters, third-order lens aberrations
- Photometry (luminous flux, luminance, illumination, Lambert surfaces)
- Optical characteristics of optical instruments (stops - pupils - chief and marginal rays - numerical aperture – f number - angle of view, field of view).
- Image quality, optical resolution, spatial frequencies, modulation transfer function, point spread function
- Magnifier, oculars, Projection systems
- Microscopes, telescopes, binoculars, telemicroscopes, cameras - photographic lenses.
- Focimeter, keratometer, corneal topographer, slit lamp, optometer, retinoscope, ophthalmoscope

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	In class
USE OF INFORMATION ANDCOMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	e-class
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	52
Laboratory practice	26
Study	102
Course total	*180*

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.*	Written final exam (50%) Laboratory work (50%)

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

In Greek

1. *Visual Optics, Drakopoulos Panos and George Asimellis, pp 440, Syghroni Gnosi 2014*
2. *Geometrical Optics, Asimellis George, Vamvakas Ioannis, Panos Drakopoulos, pp281, Syghroni Gnosi, 2012*
3. *Visual Optical Instruments, Drakopoulos Panos and George Asimellis, pp 256, Syghroni Gnosi, 2011*
4. *Basic principles of Chromatometry, V. Orphanakos, Stamoulis Ed., 2004*
5. *Applied Optics, D. Zevgolis, Tziola Publ., 3rd edition, 2017*

English

1. *Introduction to Geometrcal Optics, M Katz,World Scientific, 2002*
2. *Handbook of Optics, M. Bass editor, Volumes I,II, III, McGraw-Hill Inc, 3rd edition, 2010*
3. *Optical devices in Ophthalmology and Optometry, M. Kaschke, K. Donnerhacke, M.S. Rill, pp625,*

Wiley-VCH, 2014

4. *Optics, Blaker J.W., P. Schaeffer, an Introduction for Technicians and Technologists, Prentice-Hall, 2000*
5. *Optics, Hecht E., Addison Wesley, 4th Edition, 2001*
6. *The manual of photography, E. Allen and S. Triantaphillidou editors, 10th edition, Focal Press, 2011*
7. *Optometric Instrumentation, D.B. Henson, Butterworth-Heinemann, 2nd edition,1996*
8. *Optics and Optical Instruments, Johnson B.K., Dover Publications, 1960*
9. *Handbook of Applied Photometry, DeCusatis Editor, 1998*
10. *The light measurement Handbook, Ryer A., International light, 1997*
11. *Seeing the light, Falk D., Brill D., Stork D., John Wiley and Sons, 1986.*
12. *Geometrical Optics and Optical Design, Mouroulis P. and J. Macdonald, Oxford University Press, 1997*
13. *The eye and visual optical instruments, Smith G. and Atchison D.A. Cambridge University Press, 1997.*
14. *Modern optical engineering, Smith W.J., SPIE Press, Mc Graw Hill, 2000*