

COURSE OUTLINE

1. GENERAL

SCHOOL			
DEPARTMENT	DEPARTMENT OF PHYSICS		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	Y304-2023	SEMESTER	3rd Semester
COURSE TITLE	Atomic and Molecular Physics		
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
		4	5.0
COURSE TYPE Background, General Knowledge, Scientific Area, Skill Development	General Knowledge		
PREREQUISITES	General Physics I and II		
TEACHING & EXAMINATION LANGUAGE:	Greek		
COURSE OFFERED TO ERASMUS STUDENTS:	NO		
COURSE URL:	https://eclass.emt.duth.gr/courses/PHYSICS192/		

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 course includes chapters from Atomic and Molecular Physics such as the Photoelectric Effect, the Compton effect, Atomic and Molecular Spectra, X-rays, Masers and Lasers. Upon successful completion of the course, the student will be able to: • To understand in depth the basic concepts, principles and laws related to Modern Physics at the atomic and molecular level, X-rays and Lasers. • Ability to apply this knowledge in solving related complex problems. • Critical thinking ability to be able to evaluate, analyze and relate this knowledge. Ability to interpret phenomena of everyday life. • Ability to develop cooperation with other fellow students to solve problems related to this course.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use, Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Production of new research ideas
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3. COURSE CONTENT

Planck's theory of blackbody radiation. Photons. Photoelectric effect. Compton effect. Create a pair. Atomic spectra. Rutherford scattering. Nuclear dimensions. The Rutherford-Bohr model of the atom. Core movement. Arousal and de-arousal of individuals. Quantum numbers in the hydrogen atom. Torques and magnetic moments. Stern-Gerlach experiment. Transitions. Selection rules. Zeeman effect. Fine texture. Pauli's exclusion principle. X-rays & Auger electrons. Moseley's Law. Molecular Bonds. Molecular spectra. Masers and Lasers

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	<table> <tr> <th>Activity</th><th>Workload/semester</th></tr> <tr> <td>Bibliographic research & analysis</td><td>50</td></tr> <tr> <td>Writing project</td><td>23</td></tr> <tr> <td>Lectures</td><td>52</td></tr> <tr> <td>Total</td><td>125</td></tr> </table>	Activity	Workload/semester	Bibliographic research & analysis	50	Writing project	23	Lectures	52	Total	125
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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 evaluation languages Greek Method (Formative or Concluding) Formative Student evaluation methods <table> <tr> <td>Written Exam with Problem Solving</td><td>Rate</td></tr> <tr> <td>Written Assignment</td><td>90</td></tr> <tr> <td></td><td>10</td></tr> </table>	Written Exam with Problem Solving	Rate	Written Assignment	90		10
Written Exam with Problem Solving	Rate						
Written Assignment	90						
	10						

5. Suggested Bibliography

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