COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Mineral Resources Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	MRE202	SEMESTER	2
COURSE TITLE	PHYSICS II		

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
Lectures	3	4
Laboratory exercises	1	1
Total	4	5
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*	General Background
PREREQUISITE COURSES:	There are no prerequisite courses
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://eclass.uowm.gr/courses/MRE120/ https://mre.uowm.gr/wp-content/uploads/sites/6/2020/09/%CE%9C%CE%9F%CE%A0202.pdf

(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*

Upon the successful completion of the course, the students should:

- Have understood the basic physics laws
- Be able to discuss the measurement of physical quantities and the use of units in describing the laws of nature
- Be able to describe the physical principles that underlie engineering issues and show how they contribute to the interdisciplinary field of science and engineering
- Comprehend the basic principles of electromagnetism, optics, phenomena of interaction of electromagnetic waves with matter, atomic and nuclear physics. They should be able to understand modern applications that support these phenomena and develop critical thinking

regarding the application management
- Apply physics in problem solving for science and engineering
- Familiarize with the concepts of experimental study, measurements and error analysis that are introduced in the context of experiments.
- Communicate the outcomes of the practical work by writing a scientific laboratory report.

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

Search for, analysis and synthesis of data and information with the use of the necessary technology
Working independently
Team work
Working in an interdisciplinary environment
Production of new research ideas

(3) SYLLABUS

Electric Charge, Force, and Field
Gauss's Law
Electric Potential
Electrostatic Energy and Capacitors
Electric Current and Resistance
Electric Circuits
Magnetic field and magnetic force
Electromagnetic Induction
Alternating current – circuits
Optics
Atomic physics
Nuclear Physics

(4) TEACHING and LEARNING METHODS - EVALUATION

<table>
<tr><td>DELIVERY
Face-to-face, Distance learning, etc.</td><td>Face-to-face, Lectures, Tutorials</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students</td><td>E-Class, communication with students via e-mail</td></tr>
<tr><td>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</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>80</td></tr>
<tr><td>Laboratory practice</td><td>20</td></tr>
<tr><td>Tutorials</td><td>20</td></tr>
<tr><td>Essay writing</td><td>30</td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>150</td></tr>
</table>
</td></tr>
<tr><td>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.</td><td>Multiple choice questionnaires,
Short-answer questions, open-ended question
Problem solving,
Written work,
Laboratory report</td></tr>
</table>

(5) SUGGESTED BIBLIOGRAPHY

- Suggested bibliography:

- Giancoli, Physics for Scientists and Engineers with Modern Physics, Vol.2 D.C> Pearson Education, Inc 2022
- Halliday David, Resnick Robert, Walker Jearl, Fundamentals of Physics, , John Wiley & Sons Inc., 2008
- Raymond A. Serway, John W. Jewett, Physics for Scientists and Engineers with Modern Physics, Brooks/Cole a Cengage Learning Company 20210
- Wolfson Richard, Essential University Physics, Pearson Inc 2016
- Young, R.A. Freedman University Physics with Modern Physics, Vol.2, H.D., Pearson 2016