COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Mineral Resources Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	MRE104	SEMESTER	1st
COURSE TITLE	Physics I		

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/MRE115/

(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 be able to:

- Describe the physical principles that underlie engineering issues and show how they contribute to the interdisciplinary field of science and engineering.
- Formulate laws of physics in vector format and use elements of differential and integral calculus to define and solve application problems.
- Understand the basic principles of mechanics, oscillations, waves, fluids and thermodynamics and the modern applications that support these phenomena and develop critical thinking regarding the application management
- Apply physics in problem solving for science and engineering.
- Discuss the measurement of physical quantities and the use of units in describing the laws of nature.
- 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
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…
…….

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

Physics and measurements
Motion in a straight line
Motion in two and three dimensions
Force and motion using Newron's Laws
Energy and power, conservation of energy
Gravity
Rotation motion, rotational vectors and angular momentum
Static equilibrium
Oscillations, waves, sound waves
Fluid mechanics
Temperature, heat and the first law of thermodynamics, entropy and the second law of thermodynamics

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	E-Class, communication with students via e-mail
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*	
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.*	Multiple choice questionnaires, short-answer questions, open-ended questions, problem solving laboratory report

Activity	*Semester workload*
Lectures	80
Laboratory practice	20
Tutorials	20
Essay writing	30
Course total	*150*

(5) SUGGESTED BIBLIOGRAPHY

- Suggested bibliography:

- Giancoli . Physics for Scientists and Engineers with Modern Physics, 5th ed., Published by Pearson (February 27th 2020) - Copyright © 2022
- Halliday David, Resnick Robert, Walker Jearl, Fundamentals of Physics, John Wiley & Sons Inc., 2018
- Raymond A. Serway, John W. Jewett. Physics for Scientists and Engineers with Modern Physics, Brooks/Cole a Cengage Learning Company, 2010
- Wolfson Richard, Essential University Physics, Pearson Inc 2016
- Young, H. D., R.A. Freedman University Physics with Modern Physics, Vol.2, , Pearson, 2016