

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	PHYSICS DEPARTMENT		
LEVEL OF STUDIES	GRADUATE		
COURSE CODE	301	SEMESTER	6 & 8
COURSE TITLE	HISTORY AND PHILOSOPHY OF PHYSICAL SCIENCES		
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	
	4	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>	General Background		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><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.</i></p> <p><i>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 objective of this course is to present to the students the basic stages of development of the Physical Sciences from the ancient era to the present epoch and to connect them with the structure and the needs of the society in every time period. More analytically, after the end of this course, the student will be able to:</p> <ol style="list-style-type: none"> 1. Recall the foundations of the physical sciences in the ancient era and how these were formulated during the classic times, the Byzantine times and the Renaissance. 2. Recall where and how the scientific revolutions (first and second) took place. 3. Identify and assess the most important modern developments in the field of Physical Sciences. 4. Combine these developments with the social conditions as well as the impact that these had to the general society. 5. Realise the dependence that there exists between the science and

technology and the way that one affects and guide the other.

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
 Criticism and self-criticism
 Production of free, creative and inductive thinking
 Production of new research ideas

(3) SYLLABUS

The physical sciences from the first societies till today. Science and the problem of truth. The foundations of the Science of Physics. The Nature in ancient Greek philosophy. The dispute of Aristotelean Physics in Renaissance. The first scientific revolution - Galileo. The second scientific revolution - the discovery of X-rays. Modern developments. Societal impact of Science. Interplay between Science and Technology. The Logical Empiricism and its criticism. The problem of the method. The progress of scientific theories. Relativism and scientific rationalism.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to face learning	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT in teaching. Communication with students via e-course.	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>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.</i> <i>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	50
	Students' presentations	20
	Independent Study	27
	Exams	3
	Course Total	100
STUDENT PERFORMANCE EVALUATION		

<p><i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Oral presentations by the students during the semester.</p> <p>End-of-semester written exams.</p>
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(5) ATTACHED BIBLIOGRAPHY

<p>- <i>Suggested bibliography:</i></p> <p>- <i>Related academic journals:</i></p> <ul style="list-style-type: none"> • “Ιστορία της Φυσικής: Από την πτώση των σωμάτων έως τα ραδιοκύματα”, SegreEmilio, Εκδόσεις Δίαυλος, 1997 • Werner Heisenberg “Physics and Philosophy, The Revolution in Modern Science. Penguin 1958 “ • B. Russell, “The problems of Philosophy” 1912. • T. Maudlin, “Philosophy of Physics. Space and Time” Princeton University Press (2012) • G. McCabe, The structure and interpretation of the Standard Model • S. Weinberg, To explain the world. The discovery of modern science. 2015 • B. Greene, “The elegant Universe” 1999 • James Cushing, Φιλοσοφικές έννοιες στη Φυσική • Carl Popper, Realism and the Aim of Science
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