

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCIENCES		
ACADEMIC UNIT	PHYSICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	403	SEMESTER	7
COURSE TITLE	DYNAMICAL METEOROLOGY		
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>	Special background, specialised general knowledge		
PREREQUISITE COURSES:	GENERAL METEOROLOGY (401)		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	http://www.physics.uoi.gr/seci/courses.html#3		

(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 course provides the student advanced knowledge for an in-depth understanding of the laws governing atmospheric movements. The students are familiar with the main principles and phenomena of the Atmosphere as these have been taught in General Meteorology. For the 'quantitative' support of the theory, mathematical techniques, which have been taught the early years of his/her studies, are applied. Especially, after the successful completion of the course, the student will</p> <ul style="list-style-type: none"> • have understood the difference of the thermodynamics of the atmosphere from the classical thermodynamics. • have understood the meaning of the vertical and adiabatic lapse rate and their differences, thus being able to understand the mechanisms of rain and thunderstorm. • know what forces cause the movement of an air mass and in which cases they are balanced so that the mass moves without acceleration. • can perceive the difference between the streamlines of the wind field and the trajectories of the air masses and to support it with the solution of the differential equations. • have realized that the pressure systems are three-dimensional formations and

knows what determines their position and intensity in height.

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

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Others...

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Search for, analysis and synthesis of data and information, with the use of the necessary technology

Working independently

Team work

Production of free, creative and inductive thinking

Working in an interdisciplinary environment

Respect for the natural environment

(3) SYLLABUS

Thermodynamics of dry and moist air. Hydrostatics and vertical stability-instability. Basic equations of motion and applications to special types of flow. Trajectories and Streamlines. Continuity equation. Circulation and vorticity. The thermal wind. Temperature advection. Vertical structure of pressure systems.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	<i>Face-to-face</i>	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Students are referred to websites of meteorological maps for information and they also use special maps for exercises.	
TEACHING METHODS <i>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.</i>	Activity	Semester workload
<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</i>	Lectures	39
	Tutorials	13
	Study of bibliography	26
	Exercises	19
	Exams	3

the ECTS		
	Course total	150
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i>	Examinations at the end of the semester	
<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>		

(5) ATTACHED BIBLIOGRAPHY

- **ΕΙΣΑΓΩΓΗ ΣΤΗ ΔΥΝΑΜΙΚΗ ΜΕΤΕΩΡΟΛΟΓΙΑ**
Δ. Μεταξάς, Α. Μπαρτζώκας
 Εκδοτικός Όμιλος ΙΩΝ
 Σελίδες 270
 ISBN:978-960-508-043-3, © 2012
 Κωδικός Ευδόξου: 22768957
- **AN INTRODUCTION TO DYNAMIC METEOROLOGY**
J.R. Holton
 International Geophysics Series, Volume 88
 (Ed. Dmowska R., Holton J.R., Rossby H.T.)
 Elsevier, Academic Press, New York (1979)
- **DYNAMICAL METEOROLOGY – An Introductory Selection**
Edited by B.W. Atkinson
 Methuen, London and New York (1981)