

COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Science		
ACADEMIC UNIT	Physics		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	10EK302	SEMESTER	7
COURSE TITLE	Physical Oceanography		
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
Lectures (theory and exercises)		4	6
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialised Knowledge		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes, in the English language for Erasmus students		
COURSE WEBSITE (URL)	eclass: https://eclass.uoa.gr/courses/PHYS130/		

(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

In this course the student acquires the necessary knowledge for the understanding quantities related to ocean dynamics

With the completion of the course the student is able to:

- Describe the physical properties of seawater, observational methods of the ocean dynamics and characteristics and the dominant pattern of oceanic circulation.
- Describe the laws of ocean dynamics.
- Calculate various physical oceanic parameters such as wind-driven circulation, thermohaline circulation and ocean waves of various scales (surface and internal).

After completion of the course. The student can:

- Compose concepts and physical laws that lead to the problem solving of ocean systems.
- Estimate various variables of the oceanic circulation and ocean waves.
- Combine physical laws that describe the ocean dynamics.

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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The course aims at the following general competences

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

Adapting to new situations

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Respect for the natural environment

Production of free, creative and inductive thinking

Analytical and synthetic thinking

Critical thinking

Flexibility / Adaptability

Problem solving

(3) SYLLABUS

- Seawater properties, surface and vertical distribution of physical oceanography parameters in the world ocean.
- Conservation laws in physical oceanography.
- Currents without friction, shallow water equations and the conservation of vorticity in the ocean.
- Currents with friction: Wind-driven circulation, the Ekman surface layer and the westward intensification of ocean circulation.
- Thermohaline circulation.
- Surface gravity waves, internal waves, tides and ocean waves in the presence of rotation.
- Equatorial ocean dynamics

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY</p> <p><i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face									
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p><i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Yes</p> <p>Electronic communication with the students using ICT (Information and Communications Technology) Computer-aided lectures, use of Overhead Projectors, eclass platform</p>									
<p style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><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></p> <p><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></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Activity</th> <th style="text-align: center;">Semester workload</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Lectures - exercises</td> <td style="text-align: center;">52</td> </tr> <tr> <td style="text-align: center;">Individual Study/ Study and Analysis of bibliography / Preparation</td> <td style="text-align: center;">98</td> </tr> <tr> <td style="text-align: center;">Course Total</td> <td style="text-align: center;">150</td> </tr> </tbody> </table>		Activity	Semester workload	Lectures - exercises	52	Individual Study/ Study and Analysis of bibliography / Preparation	98	Course Total	150
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<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <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>	Final written exams in Greek									

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Ωκεανογραφία, Εισαγωγή στο Θαλάσσιο Περιβάλλον, Α. Θεοδώρου, UNIBOOKS IKE, 2017, Αθήνα, 68369735

Ωκεανογραφία, Φ. Σακελλαριάδου, ΕΚΔΟΣΕΙΣ ΣΤΑΜΟΥΛΗ Α. Ε, 2007, 23058

- Related academic journals and textbooks:

S. Pond and G. L. Pickard, 1995, Introductory Dynamical Oceanography, 2nd edition, Butterworth-Heinemann, ISBN 0-7506-2496-5.

J. A. Knauss, 1997, Introduction to Physical Oceanography, 2nd edition, Prentice-Hall, ISBN 0-13-238155-9.