COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	MAE847	**SEMESTER**	8th Semester
COURSE TITLE	FLUID MECHANICS		

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**
	3	6
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*	Specialized general
PREREQUISITE COURSES:	Classical Mechanics
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://users.uoi.gr/mxenos http://www.math.upatras.gr/~maik/RM.html

(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*

The objectives of the course are:

- Development of the theoretical background in matters relating to Fluid Mechanics.
- Ability of the student to apply the basic concepts of fluid mechanics.
- Upon completion of this course the student will be able to solve with analytical and approximate mathematical methods simple problems of Fluid Mechanics and deepen further understanding of such methods.

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…
…….

The course aims to enable the undergraduate students to develop basic knowledge of Fluid Mechanics and in general of Applied Mathematics. The student will be able to cope with problems of Applied Mathematics giving the opportunity to work in an international multidisciplinary environment.

(3) SYLLABUS

Physical properties of fluids, Static of fluids, Kinematics of fluids, Conservation of mass - continuity equation), Stream function, Differential equations of motion for ideal fluids - Euler equations, Differential equations of motion for viscous fluids - Navier-Stokes equations, Applications of Fluid Mechanics.

(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*	
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*	***Activity*** / ***Semester workload*** Lectures — 39 hrsç Study of theory — 78 hrs Home exercises — 33 hrs Total — 150 hrs
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.*	Written examination at the end of the semester (obligatory), Homework and / or midterm exam (optional).

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

- Fluid Mechanics, Goulas A., 1st Edition, 1986 (in Greek)
- Fluid Mechanics, Volume 1, A. Papaioanou, 2nd Edition, 2001 (in Greek)
- Applied Fluid Mechanics, D.G. Papanikas, 4th Edition, 2010 (in Greek)
- Computational Fluid Mechanics, I. Soulis, 1st Edition, 2008 (in Greek)