COURSE OUTLINE

(1) GENERAL

SCHOOL	SCIENCE		
ACADEMIC UNIT	DEPARTMENT OF MATHEMATICS		
LEVEL OF STUDIES	POSTGRADUATE **Studies in Mathematics**		
COURSE CODE	**313-1106**	**SEMESTER**	**A**
COURSE TITLE	MEASURE THEORY		

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	10
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*	SPECIALISED GENERAL KNOWLEDGE
PREREQUISITE COURSES:	NO
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE WEBSITE (URL)	http://www.samos.aegean.gr/samos_math/pms/lessonseng.php

(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*

Mastering the material described in the syllabus (see (3) below)

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…
…….

Working independently

Working in an interdisciplinary environment Production of free, creative and inductive thinking

(3) SYLLABUS

Algebras and σ-algebras of sets. Measurable and non measurable sets.

Outer measure and Lebesgue measure. Mesurable spaces and Measure spaces.

Measurable functions. Measurability and limit. Measure transformations.

Markov, Chebysehev and Holder inequalities.

Limit and integral: Fatou's Lemma, Monotone Convergence Theorem and Lebesgue Dominated Convergence Theorem.

Product space and product measure, Fybini's Theorem. Integration by parts.

L_p spaces and their basic properties. The Hilbert space L_2.

Signed measures and Hahn decomposition. Absolute continuity and singularity.

The Radon-Nikodym Theorem.

Borel Measures on localy compact Hausdorff spaces. Bounded linear functionals on the space of continuous functions and Riesz Representation Theorem.

(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*	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*	<table><tr><th>*Activity*</th><th>*Semester workload*</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Independent study</td><td>148.5</td></tr><tr><td>Assignments</td><td>62.5</td></tr><tr><td>Course total (25 per ECTS)</td><td>***250***</td></tr></table>
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.*	Student evaluation is done in Greek through a written examination which includes short-answer equations and problem solving. For students with disabilities, evaluation takes place via oral exams.

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

1. Real Analysis, M. Anoussis, A. Tsolomitis, V. Felouzis, Symmetria publishers, 2014 (in Greek).
2. Measure and Integral, R.L. Wheeden & A. Zygmund, Chapman & Hall/CRC Pure and Applied Mathematics
3. Real Analysis: Modern techniques and their applications, G. Folland, 2nd Edition, Wiley & Sons, Inc. 1999.
4. Read Analysis, H.L. Royden, Macmillan publishing company, 1988.