

## COURSE OUTLINE

### 1. GENERAL

SCHOOL		NATURAL SCIENCES	
DEPARTMENT		MATHEMATICS	
LEVEL OF COURSE		UNDERGRADUATE	
COURSE CODE		MAT_ST467	SEMESTER OF STUDIES 6 <sup>th</sup>
COURSE TITLE		ACTUARIAL MATHEMATICS	
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>		TEACHING HOURS PER WEEK	ECTS CREDITS
Lectures and Tutorials		4	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Elective course		
PREREQUISITE COURSES:	Recommended prerequisite knowledge: PROBABILITY I		
TEACHING AND ASSESSMENT LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)	<a href="http://www.math.upatras.gr/~vpiperig/Actuarial/">http://www.math.upatras.gr/~vpiperig/Actuarial/</a>		

### 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

With this course a student acquires the ability to use the complex notation of Actuarial Mathematics. He/she demonstrates understanding of the role of various Probability Theory techniques in risk modelling and becomes able to use the relevant knowledge acquired to present and study various insurance schemes.

On successful completion of the course a student will be able to: understand the basic notions, definitions and principles of Actuarial Mathematics; demonstrate critical thinking and ability to independently deepens his/her understanding of more complex actuarial techniques; enter into a new area of working practice.

### General Abilities

*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...*

- Adaptation to new situations.
- Decision making.
- Autonomous work.
- Work in an interdisciplinary environment.
- Project design and management.

### 3. COURSE CONTENT

Elements of the theory of interest. Annuities. Survival function, mortality tables. Premium calculation principles. Concepts of utility theory. Aggregate claim amount: individual risk model, collective risk model, risk processes. Ruin probabilities.

#### 4. TEACHING AND LEARNING METHODS - ASSESSMENT

<b>TEACHING METHOD</b> <i>Face-to-face, Distance learning, etc..</i>	Lectures (face to face)	
<b>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	✓ In-class slides ✓ Post-class support of the course via the web page and the online platform (eClass) of the Department of Mathematics	
<b>TEACHING ORGANIZATION</b> <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>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	26
	Tutorials	26
	Solving suggested exercises	50
	Hours of personal study by the student	45
	Final examination	3
	<b>Total number of hours for the Course (25 hours of work-load per ECTS credit)</b>	<b>150</b>
<b>STUDENT ASSESSEMENT</b> <i>Description of the evaluation procedure</i>  <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>  <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students</i>	<b>Assessment Language:</b> Greek <b>Assessment Language for Erasmus students:</b> English  <b>Assessment methods</b> <ul style="list-style-type: none"> <li>Take-home examination (30%) that includes:               <ul style="list-style-type: none"> <li>✓ Exercises</li> <li>✓ Presentation</li> </ul> </li> <li>Final written exams/exercises (70%).</li> </ul> Minimum passing grade: 5 Maximum passing grade: 10	

#### 5. RECOMMENDED LITERATURE

(in Greek)

- Κάκουλλος Θεόφιλος Ν. Αναλογισμός. Τόμος Ι: Θεωρία Κινδύνου και Πιθανότητες. Εκδόσεις Συμμετρία, 1995.
- Κουτσόπουλος Κωστής Χ. Αναλογιστικά Μαθηματικά. Μέρος Ι: Θεωρία των Κινδύνων. Εκδόσεις Συμμετρία, 1999.

(in English)

- Kaas Rob, Goovaerts Mark, Dhaene Jan and Denuit Michel. *Modern Actuarial Risk Theory. Using R*. 2<sup>nd</sup> ed. Springer, 2008.
- Promislow David S. *Fundamentals of Actuarial Mathematics*. 2<sup>nd</sup> ed., John Wiley and Sons, 2011.