**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | FINANCE AND STATISTICS | | | | |
| **ACADEMIC UNIT** | STATISTICS AND INSURANCE SCIENCE | | | | |
| **LEVEL OF STUDIES** | Undergraduate | | | | |
| **COURSE CODE** |  | **SEMESTER** | | **3rd** | |
| **COURSE TITLE** | **Financial Mathematics** | | | | |
| **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** |
| Lectures | | | 4 | | 5 |
|  | | |  | |  |
|  | | |  | |  |
| *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* | general background, skills development | | | | |
| **PREREQUISITE COURSES:** |  | | | | |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek | | | | |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | Yes (Exams and Bibliography in English) | | | | |
| **COURSE WEBSITE (URL)** | https://eclass.unipi.gr/courses/SAE163/ | | | | |

1. **LEARNING OUTCOMES**

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| **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* | |
| Main aim of this course is to provide an introduction to essential mathematical concepts and tools used for the analytic study of financial markets  Upon completion of this course, students should be able to:  • Assess the nature of basic theoretical concepts of Financial mathematics in connection with applications regarding loans, bonds, shares, financial derivatives etc.  • Develop appropriate mathematical techniques for the construction of loan agreements or investment strategies.  • Perform basic mathematical tasks in order to make investment decisions  • Establish all necessary mathematical skills needed for the further and deepest study of financial markets | |
| **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…*  *…….* |
| - Search for, analysis and synthesis of data and information, with the use of the necessary theoretical tools  - Adapting to new situations  - Decision-making  - Working independently  - Production of new research ideas  - Project planning and management | |

1. **SYLLABUS**

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| • The Theory of Interest  • Time value of money  • Annuities  • Loans and cash flows  • Stochastic models for financial asset prices  • The Arbitrage theorem, the Risk Neutral Probability Measure , The Fundamental Theorem of Finance.  • Discrete time market models: The binomial tree model  • Continuous time market models: Brownian motion, the Black – Scholes model |

1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY** *Face-to-face, Distance learning, etc.* | Face to face lectures |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | Educational material is available on e-class platform |
| **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 (theory) | 22 | | Lectures (projects and exercises) | 30 | | student's study hours | 58 | |  |  | |  |  | |  |  | |  |  | |  |  | |  |  | | Course total | **110** | |
| **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 consisting of  - methodology development  - theoretical and applied problems solving |

1. **ATTACHED BIBLIOGRAPHY**

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| *- Suggested bibliography:*  *- Related academic journals:*  (1) Αλεξανδρή. Ν. (1989) Οικονομικά Μαθηματικά. Εκδόσεις Σταμούλη A.E.  (2) Παπαμιχαήλ Δ. (1993) Οικονομικά Μαθηματικά Εκδόσεις Σταμούλη A.E.  (3) Ross, Sheldon (2007) Στοιχειώδης εισαγωγή στα Χρηματοοικονομικά μαθηματικά (επιμέλεια: Γιαννακόπουλος Αθανάσιος). Εκδόσεις Πανεπιστημίου Μακεδονίας.  (4) Ζυμπίδης Αλέξανδρος (2010) Χρηματοοικονομικά Μαθηματικά. Οικονομ. Πανεπ. Αθηνών. |