**COURSE OUTLINE**

1. **GENERAL**

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| **SCHOOL** | FINANCIAL AND STATISTICS |
| **ACADEMIC UNIT** | STATISTICS & INSURANCE SCIENCE |
| **LEVEL OF STUDIES** | UNDERGRADUATE |
| **COURSE CODE** | **SAOIK42** | **SEMESTER** | **8th** |
| **COURSE TITLE** | FINANCIAL ECONOMETRICS |
| **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 and Laboratory Exercises | 4 | 4 |
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| *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* | Elective (Special Background-Economics) |
| **PREREQUISITE COURSES:** |  |
| **LANGUAGE OF INSTRUCTION and EXAMINATIONS:** | Greek |
| **IS THE COURSE OFFERED TO ERASMUS STUDENTS** | YES (project in English) |
| **COURSE WEBSITE (URL)** | <https://eclass.unipi.gr/courses/SAE170/> |

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*
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| **The aim of the course is to make an in-depth introduction to modern theory and applications in the field of Financial Econometrics. This course presents the main features of financial data and the analysis of the techniques and methods necessary for the empirical study of the financial time series. The analysis of time series, both theoretically and empirically, is an integral part of the study and understanding of the functioning of the financial markets. The main goal of this course is to help students applying the theoretical knowledge of finance to real data analysis, and thus to gain a complete picture of the functioning of the financial markets. The course includes practical training with the use of econometric computer packages.****Upon successful completion of the course the students:*** **will have come into contact with an object which, although by its nature is applied, is theoretically grounded in the knowledge of mathematics and statistics acquired by students in previous phases of their studies,**
* **will further assimilate their older knowledge and become aware of the close relationship between theory and applications,**
* **understand the basic theory of econometrics, linking its main theoretical results with the assumptions on which these results are based and the constraints these hypotheses imply on the way we use econometrics in applications,**
* **acquire skills in the use of computer programs (Minitab, Excel) in the performance of econometric applications, and will understand how econometrics applies to specific problems that arise in the context of economic theory and in particular financial analysis,**
* **will be able to use what they have taught about problems similar to those discussed during the course, while the most skilled students are expected to be able to apply their knowledge to new problems by acquiring a better understanding of the problems and the restrictions that are met in econometric-based "financial packages" (risk management, etc.), in order to use them correctly and to deal with the results and forecasts with a more critical mood.**
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| **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 technology
* Adapting to new situations
* Decision-making
* Working independently
* Criticism and self-criticism
* Production of free, creative and inductive thinking
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1. **SYLLABUS**

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| 1. **Financial Econometrics - General Overview**Definitions and examples of key financial concepts: values, returns and their statistical properties, diversification, risk management, volatility and correlation of returns, forecasting, etc.
2. **Overview of Basic Statistical Theory**Random variables and their properties, samples, moments, correlation and independence, mean hypothesis tests, time series, autocorrelation, regression, predictability.
3. **Descriptive performance statistics**From prices to returns: percent vs. logarithmic returns and their relationship - Applications. Calculation and interpretation of the basic statistical properties of returns. The concept of stationarity of time series, calculation and interpretation of the autocorrelation function of a chronological order of returns, regularity checks. Checking performance moments. Calculation of static and dynamic correlations between time series of returns, lead-lag ratios for predictability, CAPM model.
4. **Regression with examples**Static regression: Overview of the least squares method (OLS) and other estimation methods, review of diagnostic and specialization controls. Robust standard errors. Applications of static regression in the CAPM model. Introduction to dynamic regression models with time series (regression with time delays of dependent and independent variables).
5. **Predictions from regression models**Calculation of point and space predictions by static and dynamic regressions. Calculation of predictive capacity of a model: statistical and financial predictability measures.
6. **Introduction to modeling and prediction of volatility and correlation**The concept of returns variability: examples of the use of variance and correlation. Calculation of rolling estimates of historical variability and correlation. ARCH and GARCH models. Variance forecasting and applications.
7. **Detailed examples of modeling real data in Finance using computer programs**Practical training in the use of econometric computer packages.
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1. **TEACHING and LEARNING METHODS - EVALUATION**

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| **DELIVERY***Face-to-face, Distance learning, etc.* | In Classroom (Face-to-Face) |
| **USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY** *Use of ICT in teaching, laboratory education, communication with students* | **Laboratory Education****Support Learning through the e-class platform****Power point presentations****Student contact electronically** |
| **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* |

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| ***Activity*** | ***Semester workload*** |
| Lectures | 46 |
| Laboratory Exercises | 6 |
| Laboratory Written Work/Essay (project) | 8 |
| Autonomous study | 40 |
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| Course total (25 hours of workload per ECTS) | ***100*** |

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| **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.* | 1. Written Examination including:

- True-False Questions- Multiple choice questions- Short-answer questions- Problem solving1. Laboratory written work/essay (optional)
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1. **ATTACHED BIBLIOGRAPHY**

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| *- Suggested bibliography:**- Related academic journals:*1. Pittis Nikitas (2017), Probabilistic Foundation of Econometrics, Eds. Stamoulis.2. Agiakloglou Christos, Mpenos Theofanis (2014), Principles of Econometric Analysis, EVGENIA SOT. MPENOU. |