

**ΟΙΚΟΝΟΜΙΚΟ  
ΠΑΝΕΠΙΣΤΗΜΙΟ  
ΑΘΗΝΩΝ**



ATHENS UNIVERSITY  
OF ECONOMICS  
AND BUSINESS

**SCHOOL OF INFORMATION SCIENCES AND TECHNOLOGY**

**DEPARTMENT OF STATISTICS**

**MSc. in QUANTITATIVE ACTUARIAL AND FINANCIAL RISK MANAGEMENT**

**STUDY GUIDE  
ATHENS, ACADEMIC YEAR 2022-23**



## **PART I: INFORMATION ABOUT THE INSTITUTION**

### **CONTACT DETAILS (Name & Address)**

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS (AUEB)

Address: 76, Patission Str. GR-10434, Athens

Telephone number: +30-210-8203911

Website: <https://www.aueb.gr> e-mail: [webmaster@aub.gr](mailto:webmaster@aub.gr)

Facebook: <https://www.facebook.com/auebgreece>

Twitter: <https://twitter.com/aueb>

Linkedin: <https://www.linkedin.com/school/athens-university-of-economics-and-business/mycompany/>

Youtube: <https://www.youtube.com/channel/UCPncunqp3bMuAHHeCikhalg>

Instagram: <https://www.instagram.com/aueb.gr/>

### **ACADEMIC AUTHORITIES**

The rectorate authorities consist of the Rector and the Vice Rectors, as per below:

#### **Rector:**

Professor Dimitris Bourantonis

#### **Vice Rectors:**

##### **Vice Rector of Academic Affairs and Personnel**

Professor Vasilios Vasdekis

##### **Vice Rector of Research and Lifelong Learning**

Associate Professor Georgios Lekakos

##### **Vice Rector of Financial Planning and Infrastructure**

Professor Konstantinos Drakos

##### **Vice Rector of International Cooperation and Development**

Professor Vasilios Papadakis

#### **School of Information Sciences and Technology**

Dean Professor Ioannis Kotidis

##### **Department of Statistics**

Chair Professor Ioannis Ntzoufras

##### **Master's Program**

Director Professor Stylianos Psarakis

##### **Contact details**

Address: 47A Evelpidon & 33 Lefkados Street, Athens, 113 62, Greece

Telephone number: +30 210 82 03 681

Email: [masterst@aub.gr](mailto:masterst@aub.gr)

Website: <https://aub-analytics.wixsite.com/msc-stats/>

## **ACADEMIC CALENDAR**

### **FALL SEMESTER**

Classes begin:	October 3, 2022
Break before Christmas Holidays:	December 23, 2022
Classes restart:	January 8, 2023
Classes end:	January 12, 2023

### **Exam period January-February 2021**

Start of Exams:	January 17, 2023
End of Exams:	January 31, 2023

### **Holidays**

October 28, 2022  
November 17, 2022  
January 6, 2023  
January 30, 2023

### **SPRING SEMESTER**

Classes begin:	February 1, 2023
Break before Easter Holidays:	April 10, 2023
Classes restart:	April 24, 2023
Classes end:	June 9, 2023

### **Exam period June 2021**

Start of Exams:	June 12, 2023
End of Exams:	June 30, 2023

### **Holidays**

February 27, 2023  
May 1, 2023  
June 5, 2023

## **UNIVERSITY LEADERSHIP & STRUCTURE**

The organization and operation of the Institution is defined by current legislation as in force. Athens University of Economics and Business is under the supervision of the Ministry of Education, Research and Religious Affairs. Its structure includes:

### **THE SENATE**

The **Senate** consists of:

- the Rector,
- the Vice-Rectors,
- the Deans of the Schools
- the Heads of the Departments
- one representative of undergraduate students, postgraduate students and doctoral candidates each

- one representative per category of staff: Special Educational Staff (EEP), Laboratory Teaching Staff (EDIP), Special Technical Laboratory Staff (ETEP) and administrative staff.

The **Senate** is the highest collective decision-making body of the University. It is comprised of the Rector, the Vice-Rectors, the Deans of the Schools, the Chairmen/Chairwomen of the Departments, students, teaching staff and administrative staff delegates.

## SCHOOLS

The Athens University of Economics and Business consists of three Schools:

1. **SCHOOL OF ECONOMIC SCIENCES**, which supervises and coordinates the operation of the Department of International and European Economic Studies and the Department of Economics.
2. **SCHOOL OF BUSINESS**, which supervises and coordinates the operation of the Department of Management Science and Technology, the Department of Business Administration, the Department of Accounting and Finance and the Department of Marketing and Communication.
3. **SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY**, which supervises and coordinates the operation of the Departments of Informatics and the Department of Statistics.

According to Law 4485/2017 (Government Gazette 114 / 4-8-2017), each School is governed by the Dean of the School, the Dean's Council and the School's General Assembly, while each Department is governed by the Department's Chairman and General Assembly.

## DEPARTMENTS

The Department is the University's main educational and academic unit, which promotes science and knowledge development in the relevant academic field, organizes and delivers teaching and ensures continuous improvement in research and education. The Department consists of the Professors, Associate Professors, Assistant Professors, Lecturers, members of the Special Educational Staff (EEP), members of the Laboratory Teaching Staff (EDIP) and members of the Special Technical Laboratory Staff (ETEP).

The Departments of the Athens University of Economics and Business are:

1. International and European Economic Studies
2. Economics
3. Management Science and Technology
4. Business Administration
5. Accounting and Finance
6. Marketing and Communication
7. Informatics
8. Statistics

According to Law 4485/2017 (Government Gazette 114 / 4-8-2017), each Department is governed by the Department's Chairman and the General Assembly.

## UNIVERSITY STAFF

The University staff consists of the following categories:

**- TEACHING STAFF:**

- The Faculty consisting of (a) Professors, (b) Associate Professors (c) Assistant Professors.
- Special Educational Staff (E.E.P.).
- Laboratory Teaching Staff (E.D.I.P.).
- Special Technical Laboratory Staff (E.T.E.P.).
- Auxiliary Teaching Staff (E.D.P.).
- Research Assistants.
- University Scholars.
- Special Assignment Teachers.

**- ADMINISTRATIVE STAFF**

**STUDENT SERVICES & FACILITIES**

The Athens University of Economics and Business provides both administrative and other services (meals, housing, library, sport facilities etc.) aiming at serving both its students and staff. More information on the organization and operation of the University's services can be found on the University's website (<http://www.aueb.gr/en>).

**GENERAL DESCRIPTION OF THE UNIVERSITY**

Athens University of Economics and Business (AUEB), as a Higher Educational Institution, is a legal entity governed by public law and supervised by the Ministry of Education, Research and Religious Affairs.

AUEB is, in order of seniority, the third Higher Education Institution of the country and the first in the fields of Economics and Business Administration. Later, the scientific fields of Informatics and Statistics were added. Since its founding, in 1920, AUEB has a rich and noteworthy tradition of significant academic achievements that define the present and create excellent prospects for the future.

The University as a center of excellence, in academic research and teaching, is rated as one of the leading universities in its subject areas in Greece and one of the best internationally. The high level of its scientific staff, the quality in teaching and research, the modern curriculum/courses, but also the high demand of its graduates enhance significantly the University's brand name and reputation, in Greece and abroad.

**LIST OF DEGREE PROGRAMMES**

Athens University of Economics and Business offers the following Degrees and streams:

<b>A/A</b>	<b>DEPARTMENTS</b>	<b>SPECIALIZATIONS</b>
1.	International and European Economic Studies	1. International Economics and Finance 2. International and European Political Economy
2.	Economics	1. Economic Theory and Policy 2. Business Economics and Finance 3. International and European Economics

3.	Management Science and Technology	<ol style="list-style-type: none"> <li>1. Operations Research and Business Analytics</li> <li>2. Operations and Supply Chain Management</li> <li>3. Software and Data Analysis Technologies</li> <li>4. Information Systems and Electronic Business</li> <li>5. Strategy, Entrepreneurship and Human Resources</li> </ol>
4.	Business Administration	<ol style="list-style-type: none"> <li>1. Business Administration</li> <li>2. Information Systems Management</li> <li>3. Accounting and Financial Management</li> <li>4. Marketing</li> </ol>
5.	Accounting and Finance	<ol style="list-style-type: none"> <li>1. Accounting</li> <li>2. Finance</li> </ol>
6.	Marketing and Communication	<ol style="list-style-type: none"> <li>1. International Management, Innovation and Entrepreneurship</li> <li>2. Human Resource Management</li> <li>3. Business Analytics</li> <li>4. Digital Marketing</li> </ol>
7.	Informatics	<ol style="list-style-type: none"> <li>1. Theoretical Computer Science</li> <li>2. Computer Systems and Networks</li> <li>3. Information Systems and Information Security</li> <li>4. Databases and Knowledge Management</li> <li>5. Operational Research and Economics of Information Technology</li> <li>6. Computational Mathematics and Scientific Calculations</li> </ol>
8.	Statistics	No specializations are offered

Detailed information about programs and curriculum is provided in each department's study guide and website.

### **MAIN UNIVERSITY REGULATIONS**

The regulations include:

- The Internal Regulations for the Operation of the Institution
- The Organization of Administrative Services
- The Regulations for the Operation of Postgraduate and PhD Programs
- The Internal Regulation for postdoctoral research
- The Exam Guide

### **ECTS COORDINATOR OF THE UNIVERSITY**

The University's ECTS Coordinator is the Quality Assurance Chairperson, who ensures the University's compliance with the principles and rules of the European credit accumulation and transfer systems, supervises compliance and implementation and is responsible for the full recognition and transfer of credit units.

## **PART II: INFORMATION ON DEGREE PROGRAMS**

### **(A) General Description**

#### **Qualification awarded**

The Postgraduate Program awards a **Master Degree in Quantitative Actuarial and Financial Risk Management**.

#### **Admission requirements**

The program accepts university graduates, from Greek or non-Greek higher education institutions that have been recognized from the Hellenic NARIC organization (DOATAP), according to the law 4485/2017 (article 34). Applicants that have not yet graduated from their universities' must submit a solemn statement of Law No. 1599/86 that if selected for the MSc program, they will have completed their undergraduate studies until the forthcoming September.

#### **Admission criteria/Registration Procedure**

The program accepts university graduates, from Greek or non-Greek higher education institutions that have been recognized from the Hellenic NARIC organization (DOATAP), according to the law 4485/2017 (article 34).

Foreign students must have proficient knowledge of the Greek language (they must either have graduated from the Hellenic high school (lyceum) or have a GAT Greek language certificate).

The program accepts up to twenty three (23) students per year.

Applicants selection is made according to the provisions of the Law No. 4485/2017 and the program's Academic Regulations as published in the Governmental Gazette No. 3601 B' (24-8-18).

The Following documents must be submitted with the application, as indicated in the official call for applications:

1. Online application form <http://e-graduate.applications.aueb.gr>
2. Curriculum Vitae
3. Copies of all University Degrees / Diplomas and Official Transcripts of marks received. Applicants that have not yet graduated from their universities' must submit a solemn statement of Law No. 1599/86 that if selected for the MSc program, they will have completed their undergraduate studies until the forthcoming September.
4. Certified copy of the English language certification verifying good command of the language (at least level B1).
5. Two confidential recommendation letters.
6. For non-Greek university degrees recognition by the Hellenic National Academic Recognition Information Centre (DOATAP) is required according to the Law No. 4485/2017 art. 34.

The applicant's evaluation process has as follows:

- a) The Admissions Committee compiles a table of all applicants



- b) Rejects all applicants that do not meet the minimum prerequisites that have been set by the Departmental Assembly.
- c) Calls all eligible applicants for a personal interview with at least two members of the Admissions Committee.
- d) Ranks all applicants according to the above mentioned quantitative and qualitative criteria and selects the ones that will be accepted.
- e) The final list of accepted applicants is validated by the Departmental Assembly.

### **Educational and professional goals**

The Postgraduate Program in **Quantitative Actuarial and Financial Risk Management** aims to provide specialized postgraduate knowledge to graduates of Greek and recognized foreign universities in the key areas of Actuarial and Financial Risk Management with emphasis on Quantitative Methods.

The program focuses on the following scientific fields (1) Stochastic and statistical modeling of financial, insurance and actuarial risk (2) Risk management techniques (3) Selection techniques of financial and insurance portfolios.

The purpose of the Program is the training of part-time postgraduate students in the quantitative and statistical analysis of financial and actuarial data and the development of modern techniques regarding the assessment / forecasting of business risks in financial and insurance-actuarial products. In particular, the Program aims to:

- The creation of specialized scientists in the above fields
- The promotion of the University internationally and to the development of cooperation networks with the international scientific community within the framework of the opportunities offered at the European level and worldwide.
- To the interconnection of academia and the educational process with the needs of the market and the economy in general.

### **Access to further studies**

Access to the PhD Program – 3<sup>rd</sup> Cycle.

### **Course structure diagram with credits:**

The course structure diagram with credits for the Academic Year 2020-21 is defined as follows:

<b>1<sup>st</sup> Semester</b> (each student selects all three <b>(3)</b> courses)	<b>ECTS</b>
Πιθανότητες και Εφαρμογές με την χρήση Υπολογιστικών Τεχνικών (Probability and Applications using Computational Techniques)	5
Στατιστικές και Εφαρμογές με την χρήση Υπολογιστικών Τεχνικών (Statistics and Applications using Computational Techniques)	5

Αγορές Χρήματος και Χρηματοοικονομική των Επιχειρήσεων ( <i>Financial Markets and Corporate Finance</i> )	5
<b>2<sup>nd</sup> Semester</b> (each student selects all three <b>(3)</b> courses)	
Τεχνικές Βελτιστοποίησης και Θεωρία Χαρτοφυλακίου ( <i>Optimization Techniques and Portfolio Theory</i> )	5
Γραμμικά Μοντέλα και Ανάλυση Χρονοσειρών ( <i>Linear Models and Time Series Analysis</i> )	5
Στοχαστικές Διαδικασίες και Αγορές Παραγώγων ( <i>Stochastic Processes and Derivative Markets</i> )	5
<b>3<sup>rd</sup> Semester</b> (each student selects all three <b>(3)</b> courses)	
Χρηματοοικονομική Οικονομετρία ( <i>Financial Econometrics</i> )	5
Χρηματοοικονομική Μαθηματικά με Υπολογιστικές Εφαρμογές ( <i>Financial Mathematics with Computational Applications</i> )	5
Ασφάλειες Ζωής – Γενικές Ασφάλειες ( <i>Life Insurance – General Insurance</i> )	5
<b>4<sup>th</sup> Semester</b> (each student selects all three <b>(3)</b> courses)	
Διαχείριση Αναλογιστικού Κινδύνου – Solvency II ( <i>Insurance Risk Management - Solvency II</i> )	5
Διαχείριση Πιστωτικού και Χρηματοοικονομικού Κινδύνου ( <i>Credit and Financial Risk Management</i> )	5
Ειδικά θέματα στα Ασφαλιστικά και την Χρηματοοικονομική ( <i>Topics in Insurance and Finance</i> )	5
<b>5<sup>th</sup> Semester</b>	
MSc Thesis	30

### Examination and assessment regulations

The final grade of each course is determined by the respective teachers. The degree may involve individual and group work of students. Participation in the exams on the specific date announced according to the exam schedule is mandatory.

The rating scale is set from zero (0) to ten (10), with grades of the whole or half unit. Leading points are the five (5) and the highest.

Each student can take exams in courses that failed during the September exam period. If a student fails in the September exam then he is entitled to be examined in the next exam of the course and in case of failure he is deleted from the program taking only one certificate of attendance.

To receive the degree must have a promotional degree in all postgraduate courses and a successful examination in the diploma thesis. If this condition is not met within the stipulated deadline, the postgraduate student is entitled to a simple certificate of successful attendance of the courses in which he received a promotional grade and leaves the Program.

**ECTS Coordinator**

The ECTS Coordinator of the University is, ex officio, the chair of the Quality Assurance Unit. The Coordinator ensures the compliance of the University with the principles and rules of the European Credit Transfer and Accumulation System (ECTS), oversees the adherence to and application of these principles and rules, and is responsible for ensuring the smooth process of ECTS unit transfer and accumulation.

## (B) Description of individual course units

### **PROBABILITY AND APPLICATIONS USING COMPUTATIONAL TECHNIQUES (m63101p)**

***Instructors: A.YANNACOPOULOS***

Core Course, 1<sup>st</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

#### **Course Description**

Fundamental concepts in probability, with emphasis in multivariate distributions, simulation techniques, stochastic processes. Analytic and numerical techniques. Emphasis in applications in risk management. In particular, we study

- the concepts of probability, random variables, moments and conditional expectation (as a random variable with emphasis in its properties as estimator) are introduced
- characteristic functions
- fundamental univariate distributions and their simulation
- fundamental multivariate distribution (elliptic distributions) and their simulation
- dependence measures and copulas
- fundamental stochastic processes (Poisson, compound Poisson etc) and their simulation

All concepts and numerical methods are illustrated within the framework of models or examples from actuarial and financial risk management.

#### **Prerequisites**

Undergraduate probability.

#### **Target Learning Outcomes**

In depth understanding of the fundamental concepts of probability theory and stochastic processes which are necessary in risk management (motivated by appropriate risk management examples). Good working knowledge of analytic methods and techniques in probability. Good working knowledge of computational techniques. Scientific and statistical computing basics.

#### **Recommended Bibliography**

- M. J. Hasset and D. G. Stewart, Probability for risk management, ACTEX Publications 2013
- J. Mc Neil, R. Frey and P. Embrechts, Quantitative risk management, Concepts techniques and tools, Princeton, 2015
- A. N. Γιαννακόπουλος, Πιθανότητες και υπολογιστικές εφαρμογές, σημειώσεις παραδόσεων

**Teaching and Learning Activities**

In class (in vivo) teaching and e-learning, computing tutorials and hands on learning.

**Assessment and Grading Methods**

Compulsory continuous assessment and oral exams/presentation of these.

## **STATISTICS AND APPLICATIONS USING COMPUTATIONAL TECHNIQUES (m63102p)**

***Instructors: P.BESBEAS – I.PAPAGEORGIU***

Core Course, 1<sup>st</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

The course provides concise coverage of the fundamentals of inference for parametric statistical models, including both theory and practical numerical computation. The course focuses on frequentist maximum likelihood estimation while also considering alternative general methods applicable to a wide range of models and emphasizing the common questions addressed by each of the approaches. The material serves as a lively introduction to the theory and tools that a beginning graduate student needs in order to make the transition to serious statistical analysis: inference; modelling; computation, including optimisation; simulation methods; and the R language. The course will deepen understanding of why and when methods work and explain how they are suitably applied in practice.

### **Prerequisites**

Probability.

### **Target Learning Outcomes**

After completing the course, the students ideally should be able to:

- Implement the standard methods from the classical mathematical statistics theory to derive estimates for unknown parameters of a population with known otherwise distribution.
- Assess and compare the derived estimates with respect to standard statistical criteria.
- Construct a confidence interval for the unknown parameters based on a sample.
- Construct a test for a statistical hypothesis involving unknown parameters of the population under study.
- Implement relevant computational methodologies and simulation techniques when an analytic approach is not feasible.
- Take advantage of the statistical programming language R for computer age statistical inference.

### **Recommended Bibliography**

- Simon Wood. Core Statistics, Cambridge University Press, 2015.
- Bradley Efron and Trevor Hastie. Computer Age Statistical Inference: Algorithms, Evidence, and Data Science, Cambridge University Press, 2016.
- John Verzani. Using R for Introductory Statistics, Second Edition, Chapman & Hall/CRC: The R Series 2005.
- Michael J. Crawley. Statistics, An Introduction Using R, John Wiley & Sons 2015.
- Leonhard Held and Daniel Sabanés Bové. Applied Statistical Inference Likelihood and Bayes, Springer 2014.

- Dennis D Boos and L. A Stefanski Essential Statistical Inference: Theory and Methods, Springer 2013.

**Teaching and Learning Activities**

Face to face teaching covering theory and practice. The practicals are implemented with R.

**Assessment and Grading Methods**

Project.

## **FINANCIAL MARKETS AND CORPORATE FINANCE (m63103p)**

**Instructors: L.ROBOLIS – G.CHALAMANDARIS**

Core Course, 1<sup>st</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

The goal of this course is twofold: First, to describe the main financial markets and instruments and, second, to analyze corporate decisions from a financial perspective. With respect to the first subject, the course focuses on money-market, capital and debt markets. With respect to the second, the course concentrates on investment and financing decisions, valuation, and the treatment of risk. Topics to be studied are the time-value of money, exchanges and Over-The-Counter Markets, law of one price, net present value rule, capital budgeting techniques and the estimation of the cost of capital. It also studies the valuation of stocks and bonds, the risk-return trade-off, the capital structure and its relationship with the value of the firm as well as the dividend policy of corporations.

### **Prerequisites**

The course is an introduction in Finance; therefore, it does not have prerequisites other than basic knowledge of mathematical calculus, probability theory and statistics.

### **Target Learning Outcomes**

On completing the course participants will:

- Be familiar with the different types of financial markets.
- Know the main principles for pricing financial securities and use them for analyzing and hedging financial risks.
- Understand how projects are valued, and will be able to use the key capital budgeting techniques (NPV and IRR)
- Know how firms raise capital from the market, and how stocks and bonds are priced.
- Understand how risk affects the value of the asset in equilibrium, and how this affects, in turn, the company cost of capital.
- Understand the trade-off firms face between tax advantages of debt and various costs of debt.
- Be able to explain and use the capital structure theory in order to determine the optimal capital structure.

### **Recommended Bibliography**

- Brealey, Myers and Allen, "Principles of Corporate Finance", McGraw-Hill 11th ed. 2014.
- Damodaran, "Corporate Finance: Theory and Practice", Wiley 2nd ed. 2001.
- Copeland, Weston and Shastri, "Financial Theory and Corporate Policy", Addison-Wesley 4th ed. 2005.



- Bodie, Merton and Cleeton, “Financial Economics”, Pearson 2nd ed. 2011.
- Fabozzi, “Capital Markets: Institutions, Instruments, and Risk Management”, (The MIT Press), Fifth Edition, 2015.

**Teaching and Learning Activities**

One three-hour lecture per week, study theory and practice in empirical exercises as homework.

**Assessment and Grading Methods**

The final grade comes from the final examination.

## **OPTIMIZATION TECHNIQUES AND PORTFOLIO THEORY (m63104p)**

***Instructors: I.VRONTOS - E.KYRIAKIDIS - G.PAPAGIANNIS***

Core Course, 2<sup>nd</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

A plethora of empirical financial problems such as portfolio construction, risk management, pricing of financial derivatives etc. require solving different optimization problems. This course will introduce and develop the relevant mathematical tools and numerical methods/techniques for analyzing and solving optimization problems in finance. The course covers linear, quadratic and dynamic programming problems. It presents nonlinear programming, introduces the basic ideas, dual methods, Lagrange multipliers, and optimality conditions for unconstrained and constrained optimization problems. Gradient descent method, steepest descent method, Newton and quasi-newton numerical schemes are presented and developed. The basic framework of evolutionary algorithms and stochastic optimization approaches is introduced and non-smooth and non-convex optimization problems are described. Different methods and techniques are presented such as the genetic algorithm, particle swarm optimization, simulated annealing, and stochastic gradient methods. Application of different optimization techniques in estimating the parameters of nonlinear statistical and econometric models is presented. Illustration of the proposed methods and techniques is given using empirical financial applications including construction of mean-variance optimal portfolios, estimation of the efficient frontier, optimization of Value-at-Risk and conditional Value-at-Risk, asset-liability management and risk management.

### **Prerequisites**

No prerequisites.

### **Target Learning Outcomes**

The aim of this module is to provide students with advanced analytical and numerical skills required to solve optimization problems in finance. After successfully completing the course, students will be able to:

- describe and solve linear programming problems
- describe and solve quadratic programming problems
- describe and explain dynamic programming problems
- describe and solve nonlinear programming problems
- explain convex sets and functions, constrained and unconstrained maximization problems
- demonstrate an understanding of numerical algorithms for solving several programming problems
- demonstrate an understanding of basic evolutionary algorithms and stochastic optimization problems
- apply optimization methods for estimating the parameters of univariate and multivariate nonlinear models
- solve simple asset-liability management problems

- solve mean-variance optimization problems
- optimize Value-at-Risk and conditional Value-at-Risk
- apply optimization methods in risk management

### **Recommended Bibliography**

- Cornuejols, G., Pena, J., and Tutuncu, R. (2018). Optimization Methods in Finance, Cambridge University Press
- Bertsekas, D.P. (2014). Constrained optimization and Lagrange multiplier methods, Academic Press
- Boyd, S. and Vandenberghe, L. (2004). Convex optimization, Cambridge University Press
- Kroese, D.P., Taimre, T., and Botev, Z.I. (2013). Handbook of monte carlo methods, John Wiley & Sons
- Nocedal, J., and Wright, S. (2006). Numerical optimization, Springer Science & Business Media
- Simon, D. (2013). Evolutionary optimization algorithms, John Wiley & Sons
- Selected papers

### **Teaching and Learning Activities**

One three-hour lecture per week, study exercises, and programming exercises as homework (some to be submitted).

### **Assessment and Grading Methods**

The final grade is the average of the final examination grade (weight 50%) and the grade of the study and programming exercises to be submitted (weight 50%).

## **LINEAR MODELS AND TIME SERIES ANALYSIS (m63105p)**

**Instructors: I.BALTAS**

Core Course, 2<sup>nd</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

This course introduces the theory and practical application of linear regression models and time series analysis. It presents the basic principles, the properties, statistical inference procedures, the construction and evaluation of forecasts and model selection for these two classes of statistical models. The empirical part of the course consists of applying regression and time series models to real data using statistical packages and software.

### **Prerequisites**

Basic knowledge of Probability Theory and Statistics.

### **Target Learning Outcomes**

Upon successful completion of the course, students:

- Will have a basic understanding of conditional mean and conditional variance
- Will extensively explore the distinct types of correlation and the cases where these may or may not be the appropriate measures for use
- Will be able to estimate the parameters of simple and multiple regression models and understand the validity (or lack thereof) of the relevant assumptions
- Will be able to make predictions via regression models and accurately quantify the corresponding uncertainty
- have understood basic concepts of time series analysis (autocovariance, autocorrelation, partial autocorrelation, stationarity, ergodicity).
- Will be able to perform unit root tests.
- Will be able to apply various transformations to achieve stationarity.
- Will be familiar with the basic stochastic time series models, both stationary and non-stationary.
- Will be able to estimate the above models, perform diagnostics and apply various selection criteria techniques.
- Will be able to use the above models for forecasting

### **Recommended Bibliography**

- Πανεπιστημιακές σημειώσεις / Lecture notes
- Applied Regression Analysis, 3rd Edition (1998), [Norman R. Draper](#), [Harry Smith](#), Wiley
- Σύγχρονες μέθοδοι ανάλυσης χρονολογικών σειρών (2013). Σ. Δημέλη, Εκδόσεις ΟΠΑ

- Time series analysis with applications in R (2008). J.D Cryer & K.S. Chan, Springer.
- Introductory Econometrics for Finance, Second Edition (2008). C. Brooks, Cambridge
- Applied Econometric Time Series, Fourth Edition (2014). W. Enders, Wiley.
- Introductory Econometrics: A modern approach, Fifth Edition (2013). J. Wooldridge, South-Western Cengage Learning

### **Teaching and Learning Activities**

One three-hour lecture per week and study exercises as homework.

### **Assessment and Grading Methods**

The course is assessed via written exam where both components of the course are being examined. Exceptionally, in the case of remote teaching, the course may be examined by assignments combined with oral examination.

## **STOCHASTIC PROCESSES AND DERIVATIVE MARKETS (m63106p)**

***Instructors: A.YANNACOPOULOS – A.TSEKREKOS***

Core Course, 2<sup>nd</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

The course covers the basic derivative securities, derivative markets and their functions, the pricing of derivative securities via stochastic processes and the risk management of financial positions via derivatives. Computational techniques of pricing derivatives are also covered. More specifically, the following topics are covered:

- Futures contracts and hedging
- Forward contracts and pricing
- Swaps
- Options contracts: Characteristics and trading strategies
- Pricing options contracts

### **Prerequisites**

There are no compulsory prerequisite courses required.

### **Target Learning Outcomes**

The students will come out of the course with a broad knowledge of derivative markets, with a special focus on pricing methods via stochastic processes and computational methods. Specifically, the course aims to help the student:

- develop a basic understanding of derivative markets and their basic functions, and
- understand and apply computational techniques, based on stochastic processes, to price derivative securities.

### **Recommended Bibliography**

- Hull, J. C. (2015) Options, Futures, and Other Derivatives, 9th edition, Pearson
- McDonald, R. L. (2013), Derivatives Markets, 9th edition, Prentice Hall
- Shreve, S. (2005), Stochastic calculus for finance Vols. I and II, Springer
- Γιαννακόπουλος Α. (2014) Στοχαστικά Χρηματοοικονομικά (σημειώσεις)

### **Teaching and Learning Activities**

Distance learning methods through e-class and Microsoft teams during the COVID19 pandemic. In the class otherwise.

### **Assessment and Grading Methods**

Assessment via a compulsory assignment during the COVID19 pandemic. Assessment via a compulsory assignment (30%) and written examination (75%) normally.

## **FINANCIAL ECONOMETRICS (m63107p)**

***Instructors: I.VRONTOS***

Core Course, 3<sup>rd</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

This course provides a broad introduction to the theory and empirical analysis of advanced econometric models in financial applications such as construction of optimal portfolios, evaluating managers' performance, and forecasting financial returns. Multi-factor models are introduced, which can be used to estimate the expected returns of financial assets, and univariate and multivariate heteroscedasticity models (ARCH/GARCH), which can be used to model the variations and covariances/correlations of financial returns. Indicative examples of the application of these advanced statistical and econometric models and techniques are (a) the construction of optimal portfolios, (b) the evaluation of the performance of the various mutual fund or hedge fund investment managers, (c) forecasts of financial series, e.g. stock returns.

### **Prerequisites**

No prerequisites.

### **Target Learning Outcomes**

The aim of this module is to provide students with advanced statistical and econometric skills required to analyze empirical problems in finance. After successfully completing the course, students will be able to:

- interpret the concepts of return and risk in financial markets
- model the expected returns of financial assets
- model the variances and covariances/correlations of financial returns
- use advanced econometric tools to analyze models used in financial applications
- forecast financial returns
- assess the performance of portfolio managers
- understand modern portfolio theory
- solve mean-variance optimization problems
- estimate the risk of financial assets

### **Recommended Bibliography**

- Elton, E.J., Gruber, M.J., Brown, S.J., and Goetzmann W.N. (2014). Modern Portfolio Theory and Investment Analysis, 9th edition, Wiley.
- Sharpe, W.F., Alexander, G.J, and Bailey, J.V. (1999). Investments, 6th edition, Prentice-Hall.
- Tsay, Ruey S. (2010). Analysis of Financial Time Series, New York: Wiley.
- Vrontos, I.D. (2016) Financial Econometrics, Lecture Notes (In Greek).
- Selected papers.



**Teaching and Learning Activities**

One three-hour lecture per week, study exercises, and programming exercises as homework (some to be submitted).

**Assessment and Grading Methods**

The final grade is the average of the final examination grade (weight 80%) and the grade of the study and programming exercises to be submitted (weight 20%), provided that the final examination grade is at least 5/10. Otherwise, the final grade equals the final examination grade.

## FINANCIAL MATHEMATICS WITH COMPUTATIONAL APPLICATIONS (m63108p)

**Instructors: G.PAPAGIANNIS**

Core Course, 3<sup>rd</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### Course Description

This course focuses on the computational part of financial mathematics and is organized in three thematic sections. The first one is about Monte Carlo methods and their applications in pricing financial derivatives under static and dynamic approaches and variance reduction methods for improving accuracy in pricing estimates. In the second part, parametric and nonparametric approaches for the risk quantification and dependence modeling are presented, with special emphasis in the calculation of insurance and financial risk. In the third section modern statistical learning techniques for the study of data from financial and insurance markets are presented.

### Prerequisites

Students should have basic knowledge of optimization, probability theory, stochastic processes and finance. For the programming part of the course and the related computational assignments basic knowledge of computational packages (e.g., Octave/MATLAB, R, Python) is required.

### Target Learning Outcomes

After successfully completing the course, students will be able to:

- develop and implement computational techniques for treating problems of financial mathematics
- use analytical-statistical methods to the stochastic modeling and interpretation of interesting quantities in financial and insurance markets
- understand and use the basic financial and insurance risk quantification tools
- apply modern methods and techniques of statistical learning for the analysis of market data

### Recommended Bibliography

- Asmussen, S., & Glynn, P. W. (2007). *Stochastic simulation: algorithms and analysis* (Vol. 57). Springer Science & Business Media.
- Bishop, C. M. (2006). *Pattern recognition and machine learning*. Springer.
- Cherubini, U., Luciano, E., & Vecchiato, W. (2004). *Copula methods in finance*. John Wiley & Sons.
- Glasserman, P. (2013). *Monte Carlo methods in financial engineering* (Vol. 53). Springer Science & Business Media.
- Hastie, T., Tibshirani, R., & Friedman, J. (2009). *The elements of statistical learning: data mining, inference, and prediction*. Springer Science & Business Media.
- Joe, H. (2014). *Dependence modeling with copulas*. CRC press.

- Korn, R., Korn, E., & Kroisandt, G. (2010). *Monte Carlo methods and models in finance and insurance*. CRC press.
- McNeil, A. J., Frey, R., & Embrechts, P. (2015). *Quantitative risk management: concepts, techniques and tools-revised edition*. Princeton University Press.

### **Teaching and Learning Activities**

One three-hour lecture per week (for 8 weeks), computational assignments to be submitted per course's section.

### **Assessment and Grading Methods**

The final grade is calculated as a weighted average of the grade in computational assignments that are submitted during the course (40%) and the grade of the final examination (60%).

## **LIFE INSURANCE - GENERAL INSURANCE (m63109p)**

**Instructors: A.ZYMPIDIS – N.TSAGAKIS**

Core Course, 3<sup>rd</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

#### A. Life Insurance

Survival function, Simple mortality table and related functions, force of mortality, laws Classics mortality, actuarial tables and commutation functions, Stochastic approach to Life Insurance. Life annuities with one or more payments annually, Relationship between annuities, life insurance of various kinds, Relationship annuities and insurance, interest rate movements and mortality. Net premiums and gross premiums, concept and process of calculating reserves, Relationship between successive stock price. Tables and Actuarial functions for two or more persons, Contingent actuarial functions. Pricing and profit-testing.

#### B. General Insurance

Uncertainty, Risk, Insurance, Insurance Companies, Actuaries, Insurance Concepts, Products, Actuarial base. Frequency, severity and pricing methodology premium adjustments, Projections and trends for the final payments by using linear and other models. Reserving methods, Analysis of Insurance Data, Triangular methods and olistic methods of reserving, Discounting reserves, and Confidence Intervals. Reinsurance schemes, «Bonus-Malus» and Markov Chains.

### **Prerequisites**

Students should have basic knowledge of mathematical calculus, linear algebra, probability and statistics.

### **Target Learning Outcomes**

- The student will receive all the necessary technical knowledge for Life and General Insurance: Pricing, Reserving and Reinsurance.
- The student will be able to understand the structure of the basic & complex products of Life Insurance and to design similar products. He (she) will also be able to design and investigate various reinsurance coverage structures.
- The student will be able to perform all the basic technical calculations in relation to the Pricing (Net and Commercial Premiums), Reserving and Reinsurance procedures.

### **Recommended Bibliography**

#### A. Life Insurance

- Zimbidis A.(2009), «Actuarial Mathematics of Life Insurance»
- Neil A. (1986), «Life Contingencies» Heinemann Professional Publishing
- Etienne De Vylder (1997), “Life insurance : Actuarial Perspectives” Kluwer Academic Print

#### B. General Insurance

- Zimbidis A. (2008) «Actuarial Mathematics of General Insurance»

- Brown R.L , Gottlieb L.R. (2005) -3<sup>rd</sup> edition “Introduction to Ratemaking and Loss Reserving for Property and Casualty Insurance”, Actex Publications,
- Mikosch T. (2006) “Non-Life Insurance Mathematics: An Introduction with Stochastic Processes”, Springer

### **Teaching and Learning Activities**

One three-hour lecture per week, study exercises as homework (some to be submitted).

### **Assessment and Grading Methods**

The final grade is the average of the final examination grade ( $\alpha\%$ ) and the grade of the study and programming exercises to be submitted ( $100\% - \alpha\%$ ), provided that the final examination grade is at least 5/10. Otherwise, the final grade equals the final examination grade. The percentage  $\alpha\%$  varies within the range 20%-40% depending on the difficulty of the exercises each academic year.

## **INSURANCE RISK MANAGEMENT - SOLVENCY II (m63110p)**

***Instructors: A.ZYMPIDIS – I.CHATZIVASILOGLOU***

Core Course, 4<sup>th</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

- Enterprise Risk Management frameworks in the context of insurance undertakings, basic principles, the role of risk culture
- Taxonomy and classification of risks that insurance undertakings are facing
- Valuation of future cash flows, calculation of the best estimate of technical provisions in the framework of Solvency II
- Risk quantification methodologies of insurance undertakings (1-year MTM approach, Liability Run-off approach), economic capital, standard approach of Solvency II
- Asset Liability Management principles and methodologies (cash flow matching, cash flow testing, key rate durations, asset-liability adequacy tests)
- The framework and processes of holistic risk management (stakeholders, risk control, strategic risk management, emergent risk management, risk management culture)
- Scenario analysis and stress tests in an ERM framework, Own Risk and Solvency Assessment in the framework of Solvency II.

### **Prerequisites**

Students should have basic knowledge of mathematical calculus, linear algebra, probability and statistics. Financial mathematics, Life contingencies, basic principles of investment theory, basic principles of corporate finance (e.g NPV methodologies).

### **Target Learning Outcomes**

- to understand the basic principles and elements of the risk management framework of Solvency II,
- to understand the risks that insurance undertakings are facing
- to understand the basic principles for the calculation of best estimate of technical provisions according to Solvency II and to be able to apply them on basic life insurance products
- to understand the need of insurance undertakings to maintain solvency capital and to be able to apply different risk quantification methodologies
- to understand the basic principles and methodologies of asset-liability management and to be able to apply them under different contexts.

### **Recommended Bibliography**

1. N. 4364/2016
2. Κανονισμός (ΕΕ) 2015/35

3. Πράξη Εκτελεστικής Επιτροπής ΤτΕ 81/2016, σχετικά με την αποτίμηση των τεχνικών προβλέψεων
4. Εισαγωγή στη Φερεγγυότητα II των (αντ)ασφαλιστικών επιχειρήσεων, Ι.Χατζηβασίλογλου, Οικονομικό Δελτίο νο 44, Τράπεζα της Ελλάδος
5. Η αποτίμηση των στοιχείων ενεργητικού και υποχρεώσεων των (αντ)ασφαλιστικών επιχειρήσεων σύμφωνα με την Φερεγγυότητα II, Ι.Χατζηβασίλογλου, Οικονομικό Δελτίο νο 45, Τράπεζα της Ελλάδος
6. Financial Enterprise Risk Management by P.Sweeting,, Cambridge University Press
7. Enterprise Risk Management – Integrated Framework by Committee of Sponsoring Organizations of the Treadway Commission (COSO)
8. Investment Science by D.Luenberger, Oxford University Press

### **Teaching and Learning Activities**

One three-hour lecture per week, study exercises as homework (some to be submitted).

### **Assessment and Grading Methods**

The final grade is the average of the final examination grade ( $\alpha\%$ ) and the grade of the study and programming exercises to be submitted ( $100\% - \alpha\%$ ), provided that the final examination grade is at least 5/10. Otherwise, the final grade equals the final examination grade. The percentage  $\alpha\%$  varies within the range 20%-40% depending on the difficulty of the exercises each academic year.

## **CREDIT AND FINANCIAL RISK MANAGEMENT (m63111p)**

**Instructors: A.EPISCOPOS**

Core Course, 4<sup>th</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

The course studies risk management, with a focus on financial institutions. Among the topics covered are: Interest rate risk. Volatility and value at risk (VaR). Regulatory framework for capital adequacy. Basel Accords I, II, and III. Credit risk models and calibration. Credit ratings. Estimation of default probabilities. Credit exposure on derivatives. Operating risk. Liquidity risk. Using derivatives contracts in risk management.

### **Prerequisites**

Essential knowledge on the valuation of derivatives contracts.

### **Target Learning Outcomes**

Μετά την επιτυχή ολοκλήρωση του μαθήματος, οι φοιτητές θα είναι σε θέση:

- Να κατανοούν τη σημασία της διαχείρισης κινδύνων, με έμφαση στα χρηματοπιστωτικά ιδρύματα.
- Να γνωρίζουν το ρυθμιστικό πλαίσιο που διέπει την κεφαλαιακή επάρκεια των τραπεζών, όπως οι Συμφωνίες της Βασιλείας I, II και III.
- Να αναλύουν και να εφαρμόζουν τα υποδείγματα μέτρησης και διαχείρισης χρηματοοικονομικών κινδύνων, όπως ο κίνδυνος επιτοκίου, ο κίνδυνος αγοράς, ο κίνδυνος ρευστότητας και ο λειτουργικός κίνδυνος.
- Να αναλύουν και να εφαρμόζουν τα υποδείγματα μέτρησης και διαχείρισης πιστωτικού κινδύνου.
- Να χρησιμοποιούν αποτελεσματικά τα παράγωγα συμβόλαια στην αντιστάθμιση κινδύνων.

### **Recommended Bibliography**

- Hull, John (2018), *Risk Management and Financial Institutions*, 5<sup>th</sup> edition, Wiley.
- Saunders, Anthony, and Marcia Cornett (2018). *Financial Institutions Management: A Risk Management Approach*, McGraw Hill.

### **Teaching and Learning Activities**

One three-hour lecture per week. Homework exercises through a derivatives analysis software.

### **Assessment and Grading Methods**



The final grade is a weighted average of the written examination grade and the grade on homework exercises with 70% and 30% weights, respectively.

## **TOPICS IN INSURANCE AND FINANCE (m63112p)**

***Instructors: ST.VAKEROUDIS***

Core Course, 4<sup>th</sup> semester, 5 ECTS units

Course level: Graduate (MSc)

Language: Greek

### **Course Description**

Review of Basic issues in Probability Theory and Stochastic Processes, Poisson Process, Brownian motion, Lévy Processes, Applications in Financial Mathematics, Interest Rate Models, Applications in Actuarial Sciences (Risk/Ruin Theory)

### **Prerequisites**

Probability and applications using computational techniques  
Stochastic Processes and Derivative Markets

### **Target Learning Outcomes**

The students will be familiarized to practical problems and the respective management solutions from the financial/actuarial industry and they will acquire the mathematical background to be able to model and solve the problems.

### **Recommended Bibliography**

- Στοχαστικά Χρηματοοικονομικά (σημειώσεις) , Α. Γιαννακόπουλος
- Εισαγωγή στον Στοχαστικό Λογισμό, Δ. Χελιώτης
- Hull, J. C. (2015) Options, Futures, and Other Derivatives, 9th edition, Pearson
- McDonald, R. L. (2013), Derivatives Markets, 9th edition, Prentice Hall
- Shreve, S. (2005), Stochastic calculus for finance Vols. I and II, Springer
- An introduction to Lévy Processes with Applications in Finance, Lecture Notes, A. Papapantoleon
- Introductory Lectures on Fluctuations of Lévy Processes with Applications, A.E. Kyprianou

### **Teaching and Learning Activities**

One three-hour lecture per week (8 weeks).

### **Assessment and Grading Methods**

The students will be graded by a final exam at the end of the lectures. Moreover, each student will submit a short essay with respect to a topic associated to the lectures during the semester

## **PART III: INFORMATION FOR THE STUDENTS**

### **GENERAL INFORMATION FOR THE STUDENTS**

Athens University of Economics and Business provides not only high-quality education but also high quality student services. The adoption of the Presidential Decree 387/83 and Law 1404/83 defines the operation, organization and administration of Student Clubs at Universities, which aim at improving the living conditions of the students and enhance their social and intellectual wellbeing through engagement and socialization initiatives.

To fulfill this objective the University ensures the required infrastructure for housing, meals and sports activities through the operation of a student restaurant, reading rooms, library, organization of lectures, concerts, theatrical performances and excursions in Greece and abroad. Further in this context, the University supports the development of international student relations, organizes foreign language classes, computer/software literacy classes, and courses in modern Greek as a foreign language for foreign students and expatriated Greek students.

#### **Meals**

In the main building of the University there is a restaurant where all members of the university community can enjoy meals for free or by paying a minimum fee. Free meals are granted to those who meet special conditions (by contacting the Student Club).

#### **Medical Services, Insurance / Healthcare**

Undergraduate, postgraduate and PhD students of the University who have no other medical and hospital care are entitled to full medical and hospital care in the National Health System with coverage of the relevant costs by the National Health Service Provider. The doctor's office is located in the main building and operates on some working days as announced. A psychiatric counseling service also operates at the University, staffed with a physician specializing in the treatment of mental health issues. More information can be found here <https://www.aueb.gr/en/content/health-care> .

#### **Services/Facilities to Students with Special Needs**

Athens University of Economics and Business ensures the facilitation of students with special needs for access to the university buildings through ramps, lifts and other equipment. There are also specific exam regulations for students with special needs.

In addition, the Library provides students with visual impairment with aids to access online the proposed reading lists of the courses taught at the University. In this context, the Association of Greek Academic Libraries has developed a multimodal electronic library called AMELIB. Entry to this service requires user authentication as well as username and password. More information can be found on the Library website <https://www.aueb.gr/en/lib/content/users-additional-needs> .

#### **Student Financial Aid – Scholarships and Awards**

Athens University of Economics and Business offers scholarships to undergraduate and graduate students in order to support them and to award and encourage excellence. The resources for these scholarships come from the Institution itself or from partnering organizations. More information about scholarships, according to the level of studies, can be found here <https://www.aueb.gr/en/content/scholarships> .

**Studies Advisor** (fill accordingly)

### **Library and Study Rooms**

The Library & Information Center of the University was established in 1920 and operates on the first and second floor of the University's main building. The AUEB Library is a member of the Hellenic Academic Libraries Association (Heal-LINK), the European Documentation Centers Europe Direct and the Economic Libraries Cooperation Network (DIOB).

Three Documentation Centers operate within the Library:

- The European Documentation Center (KET) since 1992,
- The Organization for Economic Cooperation and Development (OECD) Documentation Center since 1997,
- The Delegation Center of the World Tourism Organization (WHO) hosting publications since 2004.

The Library contributes substantially both to meeting the needs for scientific information of the academic community and to supporting studying and research of students. This objective is achieved through the unified organization of collections and the coordination of the services provided. The Library provides access to:

- Its printed collection of books and scientific journals,
- Course books used in classes,
- Its collection of electronic scientific journals
- Its collection of e-books
- Postgraduate theses and doctoral theses that are produced in Athens University of Economics and Business and deposited in digital form at the PYXIDA institutional repository
- Sectoral studies
- Statistical series by national and international organizations
- Audiovisual material
- Information material (encyclopedias, dictionaries)
- Collection of official government publications of the European Union, the OECD and the WCO
- Databases on the issues adopted by the University
- Printed collections of other academic libraries

The Library lends all its printed collections, except for magazines and statistical series, in accordance with its internal rules of operation. The Library and Information Center offers reading rooms, computer workstations for visitors, photocopiers and printing machines, and interlibrary loan of books and journal articles from other academic libraries that are members of its network. More information can be found here <https://www.aueb.gr/en/library> .

### **International Programmes and Information on International Student Mobility**

Athens University of Economics and Business is actively involved in the Erasmus+ Program by promoting cooperation with universities, businesses and international organizations of the European Union (EU) as well as in the mobility of students, teaching and administrative staff. Within the framework of this Program, the University collaborates with more than 220 European Institutions on the subjects that its Departments encompass. It is worth mentioning that more than 7,000 students have participated in the "Erasmus" Program to date. Of these, approximately 4,000 AUEB students have attended courses at Associate Universities in Europe and about 3,000 foreign students who have completed a period of study at AUEB ensure accreditation through the Credit Transfer and Accumulation System (ECTS).

Finally, AUEB, adopting the internationalization and extroversion strategy, has been successfully participating in the International Credit Mobility Program with the aim of developing international collaborations in education and research with Partner Universities in countries outside the EU via: a) student mobility b) short-term teaching staff mobility and c) teaching / administrative staff training mobility. The Program was first implemented in the academic year 2015-2016, and since then a total of 52 students and staff members moved from and to 8 Partner Institutions in countries outside the EU (USA, Canada, Singapore, Russia, South Korea, Armenia). More information can be found in the here <https://www.aueb.gr/en/content/erasmus-programme>

### **Foreign Language Courses**

Knowledge of foreign languages is a necessity in today's educational and professional context. The Student Club offers opportunities of attending foreign language classes. Classes are held in English, French, German, Spanish, Italian and Russian, and new language seminars are available upon request. More information can be found here <https://www.aueb.gr/en/content/foreign-languages-university-student-club>.

### **Connections with the Job Market and Entrepreneurship**

DASTA AUEB is the University's Employment and Career Unit that plans, coordinates and implements actions related to:

- a) Entrepreneurship and innovation
- b) Connecting students and graduates with the labor market
- c) Connecting the academic community with businesses
- d) Offering internships, and
- e) Supporting dissemination of research output.

DASTA is structured in three units:

- a) the Internship and Career Unit, that focuses on supporting our students and graduates in their professional development. The Unit also offers consulting services to students and graduates regarding work and educational future.
- b) the ACEin Unit (Athens Center for Entrepreneurship and Innovation). Its goal is to support business ventures focused on implementing an innovative idea, develop a sustainable business effort or exploit the results of their research. At the same time, the Unit organizes actions that are part of a wider network between the Unit and the market in specific productive sectors.

More information can be found here <https://www.aueb.gr/en/dasta>

### **Athletic Activities**

Students can participate in individual and team sports activities through the Department of Physical Education, which is staffed by University personnel, as well as a number of part-time instructors specialized in various sports. The University cooperates with the City of Athens Culture, Sports and Youth Organization and uses public and private sports facilities. More information can be found here <https://www.aueb.gr/en/content/athletic-activities>

### **Cultural Activities**

To fulfill its purpose of providing a multidimensional study experience at AUEB, the Student Club organizes various cultural activities, such as theater, traditional dance, choir, photography, cinema,

rhetorical club and Model Of United Nations (MUN). More information can be found here <https://www.aueb.gr/en/content/cultural-activities>

### **Student Organizations and Clubs**

Various student organizations and clubs are active within the AUEB community, including AIESEC, Erasmus Club, Investment Club, Entrepreneurship Club ThinkBiz, and other. More information can be found here <https://www.aueb.gr/en/content/student-clubs>

### **Alumni Network**

Adhering to a long tradition of educating future top executives in the economic, social and political life of the country, AUEB is proud of the fact that thousands of its graduates hold leading positions in companies, organizations, research institutes and universities in Greece and abroad. Understanding the importance of developing and strengthening the bond with its graduates, AUEB created its Alumni Network including a platform where all graduates of the University can register. The main goals of the Network are the connection of the graduates with their colleagues and former fellow students, and diffusion of information about activities, services and events in and around the University that concern them. More information can be found here <https://alumni.aueb.gr/en>

### **Volunteer Program**

AUEB's Volunteer Program was launched in September 2017 and since then has brought more than 450 volunteers to for-impact organizations around Athens, implementing more than 50 volunteer activities. The aim of "AUEB Volunteers" is to give the chance to the members of university's community, i.e. students, faculty and administrative staff, to experience volunteering so as to highlight the value of participation and contribution to society and the university, as well as to sensitize more citizens about crucial social issues. More information can be found here <https://auebvolunteers.gr/english-intro/>

### **Quality Assurance**

Athens University of Economics & Business implements a quality assurance policy in order to continuously improve the quality of its educational programs, research activities and administrative services, and upgrade the academic and administrative processes and the University's overall operations. The Quality Assurance Unit (MODIP) coordinates and supports all related activities including the administration of the University-wide teaching and course evaluation process by students across all programs. More information can be found here <https://aueb.gr/modip> .

### **Education and Lifelong Learning Center**

The Center for Education and Lifelong Learning (KEDIVIM / AUEB) ensures the coordination and interdisciplinary cooperation among all University entities in the development of continuous education programs, which complement and upgrade the skills and competences of the program participants. These programs build on participants earlier formal education, vocational training and professional experience. The aim is to facilitate job market integration, career and personal development. More information can be found here <https://www.aueb.gr/en/content/kedivim-opa>