

**ΟΙΚΟΝΟΜΙΚΟ
ΠΑΝΕΠΙΣΤΗΜΙΟ
ΑΘΗΝΩΝ**



ATHENS UNIVERSITY
OF ECONOMICS
AND BUSINESS

SCHOOL OF INFORMATION SCIENCE AND TECHNOLOGY

DEPARTMENT OF INFORMATICS (AUEB)

DEPARTMENT OF MATHEMATICS (UOA)

DEPARTMENT OF ECONOMICS (UOA)

MSc IN BUSINESS MATHEMATICS

STUDY GUIDE

ACADEMIC YEAR 2023-24

ATHENS, JANUARY 2024

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

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 Science and Technology

Dean Ioannis Kotidis

Department of Informatics

Chair Vasiliki Kalogeraki

Master's Program in Business Mathematics

Director Associate Professor Paraskevas Vassalos

Contact details

Email: pvassal@aub.gr

Website: <http://map.aueb.gr/>

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 and (d) Lecturers.
- 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:

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

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

ADMISSION/REGISTRATION PROCEDURE

Admission for undergraduate students to each department is accomplished through central University entrance exams (Pan-Hellenic examinations). The registration of the successful candidates of these exams, in the Schools and Departments of the University takes place in September on the platform of mandatory electronic registration, according to the guidelines of the Ministry of Education, Research and Religious Affairs.

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.

MSc IN BUSINESS MATHEMATICS

Director Associate Professor Paraskevas Vassalos

- **Contact details**

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

Telephone number: +30 210 82 03 643

Email: postgrad@aueb.gr

Website: <http://www.map.aueb.gr>

- **Aim of the Program**

The Interdisciplinary Interdepartmental Postgraduate Studies Program focuses on the following fields: a) mathematics and b) quantitative methods in general as applied in the fields of finance, insurance and production.

The aim of the MSc program is to train its graduates in the application of mathematics to issues of interest to the economy and production, so that graduates of the program will be able to apply this knowledge effectively in the context of a modern production or management unit.

- **Qualification awarded**

The Postgraduate Program awards a **Master Degree in Business Mathematics**.

- **Admission requirements**

Our regulations state that perspective students should preferably hold an undergraduate degree in Mathematics, Physics, Economics, Computer Science or Engineering. But they may hold any undergraduate degree provided the applicant has the prerequisites for successful completion of a quantitative methods oriented graduate program. The most important parameter we take into account is the applicant's aptitude for mathematics, coupled with a desire to see concrete managerial applications of quantitative methods. We are happily surprised whenever students graduating at the top of a class had a weak mathematics background.

- **Educational and professional goals**

The program of study intends to prepare mainly for a professional career. It does not aim to prepare its graduates for a career in the academia – although such a career is not ruled out, as evidenced by several of our graduates that hold distinguished academic and research positions. An subsidiary, ambitious goal is to introduce to everyday business practice sophisticated quantitative decision making techniques.

Also, the program tries to strike the proper balance between rigorous mathematics and relevance for the managerial practice. This balance is difficult to achieve, and perhaps our goal can be stated as to provide a credible explanation of methodologies taught, the necessary assumptions for their applicability and the risks involved.

The holders of the aforementioned master degree are entitled to apply for the PhD Program of the Department of Informatics.

Course structure diagram with credits:

The corresponding credits (ECTS) to the program requirements are in total 90, 30 per semester.

1st Semester	
MANDATORY COURSES	ECTS
Operations Research	6
Operations and Supply Chain Management	6
Data analysis with Python	6
Money and Capital Markets	6
Actuarial Mathematics and Risk Management	6
Total of ECTS	30

2nd Semester	
MANDATORY COURSES	ECTS
Applied Econometric	6
Strategies and games	6
Stochastic Processes in Finance	6
Data Management and Business Intelligence	6
Financial Business Analysis	6
Total of ECTS	30

3rd Semester	
COMPULSORY COURSES	ECTS
Mathematical and Computational Financial	6
Machine Learning and AI in Economics and Business	6
Summer School	6
Optional Courses (2 of the following)	
Special Topics in Operations Research	6
Stochastic Models	6
Financial Risk Management	6
Fintech and Blockchain	6
OR	

MSc Thesis	12
Πρακτική Άσκηση (only for full time student)	12
Total of ECTS	30

- **Examination and assessment regulations**

At the end of each academic period, a student is entitled to be examined in all courses which he/she has attended during the period. The final evaluation of each course shall be done in an appropriate manner, for example written and/ or oral examinations and/ or written semester projects contributing to the final grade.

Each student is entitled to participate in one re-examination period, during November, or fully repeat the course during the next academic year. If a student fails during the re-examination period to one or more courses, then the case is discussed by the Special Interdepartmental Committee, which decides upon his/her removal from the program.

The re-examination grade of a course cannot exceed the grade five (5) except for the cases where the Special Interdepartmental Committee decides otherwise following a justified request of the student based on health issues or other serious reasons.

The participation in the final examination of a course is mandatory and the unjustified absence of a student from an examination results in failure of the course.

ACADEMIC CALENDAR

FALL SEMESTER

Classes begin: October 2, 2023
Classes end: December 15, 2023
Break before Christmas Holidays: December 25, 2023

Start of Exams: January 8, 2024
End of Exams: January 12, 2024

Holidays

The Anniversary of Polytechnio, November 17, 2023

SPRING SEMESTER

Classes begin: January 15, 2024
Break before Easter Holidays: April 29, 2024

Classes end: July 12, 2024

Exam period July 2023

Start of Exams: July 22, 2024

End of Exams: July 26, 2024

Holidays

Clean Monday, Monday, March 18, 2024

Greek Independence Day, Thursday, March 25, 2024

Labour day, May 1, 2024

Operations Research

Course code: M33111s

Semester: Winter

Number of Credits allocated: 6

Instructor: Assistant Professor Athanasia Manou

Course level: Graduate

Course Description

Modelling of classic operations research problems. Introduction to AMPL. Solving mathematical programming problems using AMPL. Introduction to linear programming. Graphical interpretation. Simplex method and main results. Dual theory of linear programming. Dual Simplex Method. Introduction to non-linear programming. Algorithms for solving non-linear programming problems.

Learning Outcomes

Upon completion of the course, students will be able to provide mathematical modelling for production, transportation, and pricing problems. Moreover, they will be able to solve mathematical programming problems using AMPL. They will also be able to solve linear programming problems using Simplex or Dual Simplex method and non-linear programming problems applying proper methods.

Bibliography

Vanderbei, R.J. (2014) Linear Programming: Foundations and Extensions, 4th Edition. Springer.

Hillier, F.S. and Lieberman, G.J. (2015) Introduction to Operations Research, 10th Edition. McGraw Hill.

Fourer, R., Gay, D.M. and Kernighan, B.W. (2003) AMPL: A Modeling Language for Mathematical Programming, 2nd Edition. Duxbury Thomson.

Teaching and Learning Activities

Lectures.

Assessment criteria

The final grade is based on the final exam.

Language

All lectures are delivered in Greek, with extensive use of English terminology.

Operations and Supply Chain Management

Course code: M33112s

Semester: Winter

Number of Credits allocated: 6

Instructor: Professor Apostolos Burnetas

Course level: Graduate

Course Description

Production Process Analysis (capacity analysis) - Mathematical Programming Models for Production Organisation - Inventory Management - Supply Chains and Logistics - Service Systems Management - Quality Control for Product Reliability and Safety.

Learning Outcomes

Upon completion of the course the student will be able to:

- Formulate mathematical models for production and inventory management
- Calculate optimal production and ordering policies for products with constant and/or time-varying demand.
- Develop schedules of material requirements according to production policies.
- Calculate optimal ordering and safety stock policies for products with uncertainty in demand and lead time.
- Calculate optimal ordering policies for products with stochastic demand and limited shelf life

Bibliography

Nahmias – Production and Operations Analysis ii) Axsater – Inventory Theory iii) Hillier and Lieberman – Introduction to Operations Research

Teaching and Learning Activities

Lectures.

Assessment criteria

The final grade is based on the final exam.

Language

All lectures are delivered in Greek, with extensive use of English terminology.

Data analysis with Python

Course code: M33133s

Semester: Winter

Number of Credits allocated: 6

Name of Lecturer: P. Vassalos.

Objective of the course

Upon successful completion of the course, students will be able to perform data analysis using Python 3. In addition, they will be able to choose the appropriate technique depending on the problem and the type of data they intend to analyze.

Course contents

The first part of the lectures concerns the Python 3 and the presentation of the useful for data analysis libraries (Numpy, Scipy, Pandas, Matplotlib, SciKit-Learn). The second part concerns the presentation and theoretical analysis of

- Least square method and its variations
- Clustering methods
- Classification methods
- Dimension reduction techniques
- Kernel methods
- Graph

Recommended reading

- Data Mining and Analysis, Fundamental Concepts and Algorithms, M. Zaki & W. Meira, Cambridge University Press. (2014).
- Introduction to Applied Linear Algebra Vectors, Matrices, and Least Squares, S. Boyd & L. Vandenberghe, Cambridge University Press, (2018)
- Linear Algebra and Learning from Data, G. Strang, Cambridge University Press, (2019)

Teaching methods

Lectures (1 lecture of 3 hours per week), laboratory exercises

Assessment methods

The final grade is the sum of the grade of the final written examination, the grade of the laboratory exercises and the homework grade.

Language

All lectures are delivered in Greek, with extensive use of English terminology.

Money and Capital Markets

Course code: M33114s

Semester: Winter

Number of Credits allocated: 6

Name of Lecturer: Dotsis George and Petris Panagiotis

Course Description

The investments environment and the structure of the financial system, the operating mechanism of markets, information sources for investors, money and capital market products, market categories, risk and return, bond valuation, Macaulay duration, modified duration, convexity, macroeconomic variables, business cycles, industry analysis, leverage analysis (operational, financial), financial ratios, stock valuation, the dividend discount model (constant growth, variable growth), the earnings multiplier model (P/E ratio), optimal risky portfolios, the Markowitz portfolio theory, the CAPM, the SML line, the single index model, multifactor models, the efficient market hypothesis, the arbitrage pricing model, behavioral finance- analysis, technical analysis, alternative investments: evaluation of real estate investments.

Learning Outcomes

The purpose of the course is to present the structure and the operating mechanism of the financial system as well as the main instruments of money and capital market, such as fixed and non-fixed income securities and alternative investments. The objective of the course is at the end, to provide a thorough understanding of the investment process, the concept(s) of risk and return, the methodology of bond and stock valuation, and of alternative investments (real estate asset valuation), the development process of an efficient portfolio, as well as to present theoretical models, such as the CAPM, the single index model and the multifactor pricing model, the efficient market hypothesis, the arbitrage pricing model, behavioral finance analysis and technical analysis, in order to provide a better understanding of the complex mechanism of money and capital market.

Bibliography

- i) Bodie Zvi, Kane Alex, Marcus Alan, Investments, Mc Graw-Hill.
- ii) Elton, E.J., Gruber, M.J., Brown, S.J., Goetzmann, W.N. 2018. Modern Portfolio Theory and Investment Analysis, Wiley.

Teaching and Learning Activities

Lectures (1 lecture of 3 hours per week), written assignment.

Assessment criteria

The final grade of the course is formed based on the grade of the written assignment and the final written exam.

Language

Greek

Actuarial Mathematics and Risk Management

Course code: M33115s

Semester: 1st period

Number of Credits allocated: 6

Name of Lecturer: Samis Trevezas

Course Description

Utility Theory and Insurance policies, Individual Risk Model, Collective Risk Models of a single period, Collective risk Models of long period, Ruin Theory, Premium Principles and Risk Measures. Survival distributions, Annuities, Life Insurance.

Learning Outcomes

On successful completion of this course, the students should be able

- to describe the notions of premiums, insurance policies and corresponding formulas and notations
- to determine if there is a feasible insurance policy in certain problems
- to apply Individual and collective models and calculate relevant quantities
- to give the ruin probability in the classic ruin model case of long period accurately or in approximation, as appropriate and relative measures
- to price basic kinds of life insurance products and life annuities.
- to compute premiums corresponding to life insurance under various payment policies and
- to seek, use and communicate relevant information effectively in oral and written forms;

Bibliography

Bowers, N.L., Gerber, H., Hickman, J., Jones, D. and Nesbitt, C. (1986) Actuarial Mathematics, The Society of Actuaries, Itasca, IL, USA.

Kaas, R., Goovaerts, M., Dhaene, J., and Denuit, M. (2008) Modern Actuarial Risk Theory Using R, 2nd edition, Springer-Verlag Berlin, Heidelberg.

Dickson, D. (2016). Insurance Risk and Ruin (2nd ed., International Series on Actuarial Science). Cambridge: Cambridge University Press.

Dickson, D. C., Hardy, M. R., Waters H. R. (2013) Actuarial mathematics for life contingent risks. Cambridge University Press, second edition.

Teaching and Learning Activities

Lectures, Students presentations, Collaborative presentations

Assessment criteria

Assignments during courses or/ and written exams.

Language

Greek

Applied Econometrics

Course code: M33121S

Semester: Summer

Number of Credits allocated: 6

Name of Lecturer: Loukia Meligkotsidou

Course Description

Basic Econometric Models (simple and multiple regression, multiplicative model)

Estimation of the regression coefficients, properties of estimators

Confidence Intervals and Hypothesis Testing

Predictions using linear models

Heteroscedasticity in linear econometric models (tests for heteroscedasticity and estimation of coefficients)

Autocorrelation in linear econometric models (tests for autocorrelation and estimation of coefficients)

Tests for structural change (dummy variables, interactions)

Econometric models for Time series data (AR, MA, ARMA, ARIMA)

Autocorrelation and partial Autocorrelation

Box-Jenkins Methodology for time series analysis

Stationarity and stationarity tests

Invertibility

Conditional Heteroscedasticity Models (ARCH, GARCH)

Forecasting using time series models

Applications to economic and financial data

Learning Outcomes

After completing this course the students will have become familiar with the most important tools for modeling and analysis of cross-sectional and time series data and also they will be capable of applying these methods to actual economic and financial data.

Bibliography

Οικονομετρία, Ηλία Τζαβαλή

Time Series Analysis, Hamilton

Basic Econometrics, Gujarati

Econometric Analysis, Greene

A guide to Econometrics, Kennedy

Applied Econometric Time Series, Enders

Basic Econometrics, Gujarati

Time Series Models, Harvey

Teaching and Learning Activities

Teaching of the econometric theory using slides, theoretical and practical exercises, application of the methods to real economic and financial data with the use of computing techniques in Matlab.

Assessment criteria

Written examination and/or written assignments

Language

Greek

Games and Bargaining

Course code: M33122s

Semester: Summer

Number of Credits allocated: 6

Name of Lecturer:

Course Description

Introduction to Decision Theory and Game Theory in the tradition of Luce and Raiffa's standard textbook.

Learning Outcomes

Provide the elements of the above theories, and show their applications to economics (eg monopoly regulation, Cournot equilibrium) finance (Markowitz portfolio)

Bibliography

Θεωρία Παιγνίων Συγγραφέας Γ. Σταματελόπουλος

Μαθηματική στατιστική Συγγραφείς: Κολυβά Μαχαίρα, Φωτεινή Χατζόπουλος, Σταύρος

Teaching and Learning Activities

Lectures, Homeworks, and Projects

Assessment criteria

The final grade is an average of the final exam, homework and project scores.

Language

All lectures are delivered in Greek, with extensive use of English terminology.

Stochastic Processes in Finance

Course code: m33123s

Year of Study: 1st

Semester: Spring

Number of Credits allocated: 3

Name of Lecturer: I. Emmanouil

Course Description

Information, σ -algebras and probability measures, independence of random variables, equivalent probability measures and densities, conditional expectation.

Martingales and martingale transformations, stopping times and optional stopping.

Discrete market model, completeness and viability, option valuation in incomplete markets, examples. Equivalent martingale measures and option valuation.

Random walks and Brownian motion, stochastic integration and Ito's lemma, stochastic differential equations.

Continuous market models and valuation of derivatives, the Black Scholes formula, interest rate models

Learning Outcomes

The purpose of the course is to provide the necessary background from Probability Theory and Stochastic Processes for students to understand the structure of both discrete and continuous time models that appear in the research literature concerning the valuation of derivative securities in Mathematical Finance.

Bibliography

Cheliotis: A second course in probabilities (in Greek). Kallipos repository

Cheliotis: Introduction to Stochastic Calculus (in Greek). Kallipos repository

N.H. Bingham, R. Kiesel: Risk-Neutral Valuation, Pricing and Hedging of Financial Derivatives. Springer Finance Textbooks 2004

M. Capinski, T. Zastawniak: Mathematics for Finance, An Introduction to Financial Engineering. Springer Undergraduate Mathematics Series 2011

R.J. Elliott, P.E. Kopp: Mathematics of Financial Markets. Springer Finance Textbooks 2005

P. Roger : Les outils de la modélisation financière. PUF 1991

Teaching and Learning Activities

Lectures (one 3-hour lecture per week)

Assessment criteria

The grade is based on the final written examination.

Language

Greek

Course code: m33124s

Semester: Spring

Number of Credits allocated: 3

Name of Lecturer: P. Vassalos

Course Description

The first part of the lectures, students will learn how to access and leverage information via SQL for analysis, aggregation to visualization, create dashboards, and be a source for business intelligence. In the second part of the course the theoretical background of Business Intelligence and the most common algorithms and techniques for data mining and pattern recognition are studied.

Learning Outcomes

Upon successful completion of the course, students will be able to create and manipulate relational databases, to visualize appropriately complex datasets and to formulate the appropriate data utilization mechanisms for decision support. Moreover will have the knowledge and skills to apply the principal algorithms and techniques used in data mining.

Bibliography

- Data Mining and Analysis, Fundamental Concepts and Algorithms, M. Zaki & W. Meira, Cambridge University Press. (2014).
- Βάσεις Δεδομένων και SQL Μια πρακτική Προσέγγιση, Αθανάσιος Σταυρακούδης, Εκδόσεις Κλειδάριθμος, Αθήνα (2015).

Teaching and Learning Activities

Lectures (1 lecture of 3 hours per week), laboratory exercises

Assessment criteria

The final grade is the sum of the grade of the final written examination, the grade of the laboratory exercises and the homework grade.

Language

Greek

Corporate Finance

Course code: M33125s

Semester: Spring

Number of Credits allocated: 6

Name of Lecturer: Kenourgios Dimitris, Savvakis Georgios, Spilioti Styliani

Course Description

This course introduces a framework for analyzing firms using publicly available information, such as information contained in financial statements, to generate estimates of future corporate performance. In addition, it shows how the value of a stock or firm in an efficient market reflects expectations of future performance.

In particular, we focus on the following topics:

- Introduction to Financial Statements
- Ratio Analysis
- Risk, Return & WACC
- Capital Structure
- Financing and Dividend Policy

Learning Outcomes

The aim of the course is to understand the financial analysis of financial statements, the time value of money, the valuation of bonds and shares, the capital budgeting decisions and the investment evaluation criteria, dividend policy, capital structure and the cost of capital.

Bibliography

1. Brealey, R., Myers, S., & Allen, F. Principles of Corporate Finance, 10th Edition, Εκδόσεις McGraw Hill, 2013.
2. Ross, S., Westerfield, R.W. and Jaffe, J. Corporate Finance, 12th Edition Εκδόσεις, McGraw Hill (Irwin Series in Finance), 2019.

Teaching and Learning Activities

Lectures (1 lecture of 3 hours per week), exercises and individual programming assignments.

Assessment criteria

The final grade is the sum of the grade of the final written examination, the grade of the laboratory exercises and the homework grade.

Language

Greek

Mathematics and Computational Finance

Course code: M33131s

Semester: Summer

Number of Credits allocated: 6

Name of Lecturer: Thomas Poufinas

Course Description

The topics that will be covered in the course concern the presentation of all the financial assets and their valuation, as well as the construction of portfolios from these assets. More specifically the topics covered include:

- Present Value, Future Value, Payment Series, Loans (unless taught in another course)
- Money and capital markets
- Bonds
 - Definition
 - Valuation
 - o Yields
- Interest rate curve
 - o Spot, Forward, Short Rates
- Interest rate risk
 - o Duration
 - o Convexity
- Stocks
 - o Valuation
 - o Performance
 - o Financial Indicators
- Portfolio Theory
 - o Mean Variance Portfolio Theory
 - o CAPM
 - o Utility Functions
 - o Factor Models
 - o Arbitrage Pricing Theory
- Company Financing
 - o Cost of Capital
 - o Capital Structure

Learning Outcomes

Students after the end of the course

- Will know the markets, the equity and fixed income securities.
- Will be able to value bonds and stocks
- Will understand the construction of portfolios and their evaluation with appropriate indicators.
- Will comprehend the investment strategies, the modern portfolio theory, the capital asset pricing model and the factor valuation models.
- Will understand the forms of portfolio management (passive and active) and when each of them is implemented with reference to the interests of banking, insurance and investment organizations.

Bibliography

1. Bodie, Marcus, Kane – Investments
2. Luenberger – Investment Science
3. Baxter, Rennie – Financial Calculus
4. Poufinas – Fixed Income Investing (upcoming)

Teaching and Learning Methods

The teaching and learning methods that will be employed in the course include (depending on the conditions):

- Teaching in the classroom (or distant)
- Assignment and solution of exercises
- Posting notes, slides, etc. on e-class
- Learning process support through e-class
- Use of the internet
- Participation in seminars, student competitions and special events and conferences (depending on the conditions).

Assessment Criteria

- Written examination in the classroom (or distant) with
 - o Exercises related to the quantitative parts of the topics covered
 - o Comparative evaluation of the relevant theory
- Written essay (possibly instead of a written exam in case it takes place remotely) with simulation of real conditions and assets or portfolios in the form of an exercise as an application of the topics of the theoretical background presented.

Language

Greek using terms and bibliography in English.

Machine Learning & Artificial Intelligence

Course code: m33131s

Semester: Spring

Number of Credits allocated: 6

Name of Lecturer: Panagopoulos D.

Course Description

Clustering techniques. Clustering paradigm. Dimension reduction without linear algebra. Ensembles, random forests και xgboost. Imbalanced sets, classification metrics, extreme classifiers. Recommendations. Introduction to neural network. Neural networks architectures. Advanced applications of neural networks. Text analytics. Free choice of topic.

In particular, we focus on the following topics:

- Introductory Derivatives Concepts
- Forward Contracts
- Futures Contracts
- Swaps
- Hedging, Speculation and Arbitrage

Learning Outcomes

The purpose of the course is to build on programming and data analytics notions that the students were introduced to in previous courses. New notions and techniques from machine learning and artificial intelligence will be presented by their application to datasets and their use for answering realistic problems.

The above will be done through use of Python¹ and open datasets.

Bibliography

1. "Hands-on Machine Learning with Scikit-Learn, Keras, and TensorFlow Concepts, Tools, and Techniques to Build Intelligent Systems", Aurelien Geron, O'Reilly Media

Teaching and Learning Activities

Lectures (1 lecture of 3 hours per week), individual assignments, final project.

Assessment criteria

The final grade is the grade of the final, mandatory project.

Language

Greek

¹ Additional material covering, to the extent possible, other programming languages and platforms like R, SQL, KNIME will be provided.

Advanced Topics in Operations Research

Course code: m33231s

Semester: Spring

Number of Credits allocated: 6

Name of Lecturer:

Course Description

Linear programming applications in network flow problems. The transfer problem and the assignment problem, along with their specialized solution algorithms and their connection to the Simplex method.

Network optimization problems. Problem formulation in flow networks and presentation of the main categories: Problems of shortest path, problems of the minimum spanning tree, problems of maximum flow in the networks and problems of total flow cost minimization. Project Management with PERT / CPM techniques.

Integer Programming Problems. Formulation of mixed integer (MIP) and binary integer programming (BIP) problems. The branch and bound solution technique and relevant applications.

Learning Outcomes

Upon completing this course, students will be familiar with various categories of complex optimization problems in Mathematical Programming, emphasizing the appropriate modeling and the adaptation of specific solving techniques that lead to equivalent linear programming problems. Students will identify several applications as transfer, assignment, and network optimization problems, develop the equivalent linear programming problem, and apply the appropriate methods for finding the optimal solution. They will also be able to use binary variables to model selection decisions and sets of constraints within the Mixed Integral Linear Programming framework.

Bibliography

Core:

Hillier, F.S. and Lieberman, G.J., "Introduction to Operations Research", 9th edition, 2010.

Φακίνος, Δ., Οικονόμου, Α., "Εισαγωγή στην Επιχειρησιακή Έρευνα", Εκδόσεις Συμμετρία, 2003.

Supplementary:

Taha H. A., "Operations Research: An Introduction", 10th edition, Pearson.

Wayne, W. L., "Operations Research: Applications and Algorithms", 4th ed.

Teaching and Learning Activities

Lectures, Homeworks, and Projects

Assessment criteria

The final grade is an average of the final exam, homework and project scores.

Language

All lectures are delivered in Greek, with extensive use of English terminology.

Financial Risk Management

Course code: m33233s

Semester: Spring

Number of Credits allocated: 3

Name of Lecturer: Kyriakopoulos Constantinos

Course Description

We focus on the financial risks (market risk, liquidity risks, credit risks) and associated risks (e.g. operational risks), their characteristics, and how they affect the decision making of an organization. The holistic philosophy on financial risk management is introduced. Risk factors. Linear and non-linear risk models. Var methodology on an instrument level (stocks, bonds, FX, commodities, derivatives) and on an organization level. Credit risk analysis and modelling. Particular focus on how banks (and other financial institutions) measure financial risks for portfolio risk management and capital adequacy reasons

Learning Outcomes

The purpose of the course is the introduction to management of financial risks. At the end of the course the basic financial risk taxonomy and the measurement of financial risks on an instrument and company level will be understood and used in order to make decisions on a risk-adjusted basis.

Bibliography

1. Risk Management in banking, Joël Bessis, Wiley
- 2 The Fundamentals of Risk Measurement, Christopher Morrison, Mc-Graw Hill
- 3 Financial Risk Manager Handbook , Philippe Jorion , Willey Finance

Teaching and Learning Activities

Lectures (1 lecture of 3 hours per week)

Assessment criteria

The final grade is the grade of the final written examination (or the grade of a final assignment)

Language

Greek

Financial Technology & blockchain

Course code: M33235s

Semester: Spring

Number of Credits allocated: 6

Name of Lecturer: Koutsoupakis, D.

Course Description

The course deals with the subject of digital technology in Money and Capital markets. It is possible to separate the course into two main FinTech fields namely traditional and alternative financial technology (FinTech). Traditional refers to goods and services within the regulatory Financial System as we know it today. The main axis is centralization and refers to banking, payment service providers, money and the capital markets. Here, the FinTech industry develops products for organizations that operate essentially under the supervision and licensing of authorities which regulates the well protected concepts of Investment and Credit (Loans). On the other hand, in the last years another equally interesting form of fintech has been developed and continuous to do so at a fast pace. The important difference lies in the fact that Investment and Credit, thus the issuance of securities takes on a more decentralized character which is outside the direct regulation exercised by a Central Bank or a Capital Markets Commission. The course will present and discuss how monetary (through the creation of distinct digital assets called cryptocurrencies) and non-monetary applications (other digital assets such as non-fungible tokens/NFTs) are developed through the blockchain technology and in turn transform the Financial Technology in both research and in the industry. In more specific topics in the field of alternative finance (alternative finance), cryptocurrencies will be analyzed with regard to the technological (technology) and economic (economy) protocol by which they operate.

In particular, we focus on the following topics:

- Traditional fintech products
- Bitcoin and the blockchain technology
- Taxonomy of cryptocurrencies
- Design of bespoke cryptocurrencies
- Trading cryptocurrencies
- Regulation of digital assets

Learning Outcomes

The objective of this course is to allow students to gain knowledge and understanding about the various applications of financial technology (FinTech) through specific practices in research and in the industry. Throughout the lectures, students will get to know the ways of designing bespoke financial technology products in traditional and regulated markets (exchanges, payment institutions, electronic publishers, credit institutions, other financial institutions and non-financial institutions). In addition, the course follows the recent developments in financial technology and will introduce the students to blockchain applications and the distributed ledgers technology. The goals are to familiarize students with the various fields of cryptocurrencies with respect to classification and inherent economic protocol (tokenomics), with

how alternative investment products such as tokens are created using collateral and how the Public Offerings of cryptocurrencies are conducted from the internet (Initial Coin and Token Offerings),

Bibliography

- Abadi, J., & Brunnermeier, M. (2018). Blockchain economics (Tech. Rep.). National Bureau of Economic Research.
- Alexander, C., Choi, J., Park, H., & Sohn, S. (2019). Bitmex bitcoin derivatives: Price discovery, informational efficiency, and hedging effectiveness. *Journal of Futures Markets*.
- Biais, B., Bisiere, C., Bouvard, M., & Casamatta, C. (2019). The blockchain folk theorem. *The Review of Financial Studies*, 32(5), 1662–1715.
- Bohme, R., Christin, N., Edelman, B., & Moore, T. (2015). Bitcoin: Economics, technology, and governance. *The Journal of Economic Perspectives*, 29 (2), 213–238.
- Budish, E. (2018). The economic limits of bitcoin and the blockchain (Tech. Rep.). National Bureau of Economic Research.
- Catalini, C., & Gans, J. S. (2016). Some simple economics of the blockchain (Tech. Rep.). National Bureau of Economic Research.
- Easley, D., O’Hara, M., & Basu, S. (2019). From mining to markets: The evolution of bitcoin transaction fees. *Journal of Financial Economics*.
- Schilling, L., & Uhlig, H. (2019). Some simple bitcoin economics. *Journal of Monetary Economics*.

Teaching and Learning Activities

Lectures (1 lecture of 3 hours per week) with illustrative case studies.

Assessment criteria

The final grade of the course is formed based on the grade of the individual work which is in written form (slides, document accompanied with datasets and the code when this is applicable) and presented in the classroom.

Language

Greek

Stochastic Models

Course code: M33232s

Semester: Spring

Number of Credits allocated: 6

Instructor: Associate Professor Samis Trevezas

Course level: Graduate

Course Description

Deterministic Dynamic Programming, principle of optimality and cost function, Stochastic Dynamic Programming, graphical and table assisted methods of solving a problem of dynamic programming, introduction to Markov chains, communication of states, recurrent Markov chains, stationary distribution, mean cost function in stationarity, Markov Decision Processes, optimal decision policy, policy improvement algorithm

Learning Outcomes

Upon completion of the course, students will be acquainted with the most basic notions and characteristics of a Dynamic Programming problem, as well as the most basic principles of problem solving in Deterministic and Stochastic Dynamic Programming. The course will enable them to identify the Markov property and be acquainted with the basic principles of Markov chains (MCs). Besides, they learn to compute the stationary distribution of a finite state MC and the expected average cost in stationarity. Finally, the students will be able to model a decision problem in the framework of Markov Decision Processes and solve the corresponding problem with a policy improvement algorithm.

Bibliography:

Core:

Hillier, Frederick S., and Gerald J. Lieberman. *Introduction to operations research*. McGraw-Hill Science, Engineering & Mathematics, 1995.

Supplementary:

Φακίνος, Δ., Στοχαστικά Μοντέλα στην Επιχειρησιακή Έρευνα. Εκδόσεις Συμμετρία, 2007.

Ross, S.M., *Applied Probability Models with Optimization Applications*. Dover, 1992.

Teaching and Learning Activities

Lectures, Homeworks and Projects

Assessment criteria

The final grade is an average of the final exam, homework and project scores.

Language

All lectures are delivered in Greek, with extensive use of English terminology.

Elective Course, 12 ECTS units

Course level: Graduate (MSc)

Course Description

The dissertation thesis (DT) consists of the writing by the student of a research essay where the existing bibliography is studied, methodologies are studied and if needed they adopt to the current problem, research hypotheses are formulated, relevant data are collected and processed, empirical results are recorded and conclusions are drawn.

The content of the DT includes, indicatively, some of the following sections: Summary, Introduction, Literature review, Research Hypotheses Development, Description of the data, Empirical results, Simulations to support the findings, Summary and conclusions, Bibliography, Appendices.

Prerequisites

For the preparation of the DT, it is required that the courses of the Msc Program have been completed.

Learning Outcomes

The DT aims to give the opportunity to the student to develop and apply research methodologies in real data to topics of scientific interest related to the studies of the Msc program. The goal is for the student to delve deeper into the topic under consideration, study the existing literature, develop his critical thinking by formulating appropriate research hypotheses, collect and analyze appropriate empirical data and acquire skills of investigation and derivation of substantiated conclusions.

Recommended Bibliography

The bibliography is determined by the Supervising Professor according to the topic of the thesis

Assessment and Grading Methods

The DE is evaluated by a **three-member examination committee** made up of the supervisor and two other faculty members or lecturers at the program as the valid regulations describe.

Use of Information and Communications technology

Yes

Teaching Methods

For each thesis there is one supervisor that has to guide the student for any problem that may occur, provide additional help on the bibliography but also supports the student during all the period.

Language: Greek or English

M33237 – Internship

Elective course, 12 ECTS units

Course level: Graduate (MSc)

Course Description

Internship has the duration of up to five months in institutions of the students' choice, which are related to the scientific subject of the program. The students undertake tasks and responsibilities assigned to them by their supervisor in the organisation.

During the internship the students:

- Get in touch with the modern working environment
- Apply their scientific knowledge in a real working environment
- Reinforce their scientific training with professional skills and qualifications
- Gain professional experience.

Prerequisites

Internship is addressed exclusively to full time students of the Program.

Learning Outcomes

It is expected that upon completion of the internship, students will be able to:

1. Apply knowledge and skills developed during their studies in the workplace.
2. Judge whether the subject of their internship is a possible career choice.
3. Evaluate their knowledge and skills and their general scientific training in relation to the professional field in which they practised.

Assessment criteria

Upon completion of the Internship, the following are submitted electronically to the Secretariat: (a) an evaluation form of the student's performance, submitted by the host institution and (b) an evaluation form, submitted by the student.

The Secretariat forwards the above forms to the Supervisor of each Internship, who evaluates the student's performance ("Successfully" or "Unsuccessfully") by completing a Evaluation Form and submitting it to the Secretariat.

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 (WTO) 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>