MSc Applied Economics
Specialization: BUSINESS ANALYTICS

1st Semester

MSc Applied Economics Specialization : Business Analytics		
MODULES	**TYPE OF MODULE**	**ECTS**
Data Analytics	COMPULSURY	7
Business Strategy	COMPULSURY	7
Quantitative Methods for taking Business Decisions	COMPULSURY	7
Forecasting Methods	COMPULSURY	7
Research Methodology Seminar I	COMPULSURY	2

DATA ANALYTICS

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	Data Analytics		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
Lectures - exercises - practices	3 HOURS	7

TYPE OF MODULE	COMPULSORY
PROREQUISITE MODULES:	NO
LANGUAGE OF TEACHING AND TESTING:	GREEK
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	eclass.uth.gr

2. LEARNING OUTCOMES

Learning Outcomes

After the successful completion of the course, the student should be able to:

• Understand the basic algorithms used in Data Analytics.

• Utilize the features of the Python programming language and the packages of the statistical computing language R for data analysis in financial models and business applications.

• Apply data analysis techniques to business applications and in finance.

• Comprehend the fundamental methods of handling Big Data.

General Competencies

The course "Data Analytics" aims to familiarize students with modern technologies and available

tools for data management, processing, and analysis. Special emphasis is placed on business and financial applications of Data Analytics. The focus of the course is twofold. Students are taught on a theoretical level the basic algorithms of Data Analytics, while simultaneously using them in various financial and business examples, developing applications in Python and R.

3.MODULE CONTENT

Introduction to Data Analytics.

Applications of Data Analytics in Economics and Finance.

Data Collection and Preparation.

Portfolio Analysis and Visualization of Results.

Time Series Forecasting in Finance.

Predictive Modeling, Correlation, and Segmentation.

Model Adaptation to Data. Addressing the Overfitting Problem.

Similarity, Neighbors, and Clusters.

Artificial Intelligence, Machine Learning, and Deep Learning in Finance.

Big Data in Business .

Practical Examples in Python and R.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Onsite / Remote / Hybrid
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support of the learning process through the eClass platform the unified e-learning system of the University of Thessaly which is supported by the Library and Information Centre and MSTEAMS platform for education.
ORGANISATION OF TEACHING	More specifically, the workload of the module is analyzed as follows:

Είδος	Περιγραφή	WORKLOAD (HOURS)
	Lectures	39
	Study at home	80
	Completion of assignments	50
	Preperation for the final exam	39
	Final Examination	2
	Total	210

MODULE ASSESSMENT	Evaluation Method:

	- Individual Programming Exercises: 30% - Written Examination: 70%
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	• Foster Provost and Tom Fawcett, "Data Science for Business", Edited by Vasilis Verykios, Klidarithmos Publications. • Taddy Matt, Hendrix Leslie, Harding Matthew, Modern Business Analytics. McGraw Hill • Paul Deitel and Harvey Deitel, "Introduction to Python for Computer Science and Data", M. Gyuras Publishing. • Dimitrios Karolidis, "Learn Python Easily", Avakas Publishing. • Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani (2021). "An Introduction to Statistical Learning with Applications in R". ISBN: 978-1-0716-1417-4 Springer. (Free e-book, Access provided by HEAL-Link Greece - University of Thessaly) • Vasilios S. Verykios, Vasilios Kanglis, Elias K. Stavropoulos, "Data Science through the R Language", Available on Kallipos platform.

BUSINESS STRATEGY

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	BUSINESS STRATEGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
		3 HOURS	7
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND TESTING:	GREEK		

THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	https://eclass.uth.gr/courses/ECON_P_147/

2. LEARNING OUTCOMES

Learning Outcomes

Upon completion of the module, students should be able to:

- Understand the basic principles of Strategic Business Management and their impact on business operations
- Plan and evaluate the operational, competitive and corporate strategy of a firm
- Recognize and evaluate the strategic movements of modern businesses, proposing possible improvements.
- Interpret the effect of external factors on business operations
- Investigate and plan the internationalization of a firm

General Competencies

Upon successful completion of the module, students will develop and cultivate basic professional and social skills, namely:

- Search, analysis and synthesis of data and information, using necessary technologies
- Adaptation to new situations
- Decision making
- Autonomous work
- Teamwork
- Work in an international environment Respect for diversity and multiculturalism
- Exercise criticism and self-criticism
- Promotion of free, creative and inductive thinking

3.MODULE CONTENT

• Strategic analysis of the external environment: analysis of the macro (PEST-DG) and micro environment (Porter's 5 forces) of the business.

• Corporate mission, vision, strategic goals, strategic considerations.

• Business strategy direction: stability, growth, rescue-turnaround.

• Strategies for achieving competitive advantage: cost leadership, differentiation, focus.

• Internationalization strategies of the company: alliances, joint ventures, acquisitions, exports, oligopolistic reaction theories, selective paradigm theory (Dunning).

• Ways to implement strategy: Acquisitions, Mergers and Strategic Alliances: Analyzing, deciding and ensuring the success of strategic development through acquisitions, mergers and strategic alliances.

• The technological strategy, internally and externally.

• Strategy evaluation and selection: Rumlet's model, acceptability analysis, feasibility analysis, balanced scorecards analysis. Strategy implementation.

• Portfolio techniques for making strategic decisions: experience curve, BCG matrix, GE matrix, Hofer's product/market evolution matrix, life cycle matrix, portfolio cube, risk cube.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Mixed
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process support through the e-class online platform. Use email, MS TEAMS
ORGANISATION OF TEACHING	More specifically, the workload of the module is analyzed as follows:

Είδος	Περιγραφή	WORKLOAD (HOURS)
	Lectures	39
	Study at home	90
	Completion of assignments	49
	Preparation for the final exam	30
	Final Examination	2
	Total	210

MODULE ASSESSMENT	Written exam and group assignments

5. RECOMMENDED BIBLIOGRAGHY

Suggested Bibliography:

Textbooks in Greek

- Παπαδάκης Β. (2016), *Στρατηγική των Επιχειρήσεων: Ελληνική και Διεθνής Εμπειρία*, Τόμος Α, 7η εκδ., Εκδόσεις Μπένου: Αθήνα
- Senior B., 2017. Οργανωσιακή Αλλαγή. Εκδόσεις Broken Hill, Αθήνα.

Academic journals (in alphabetical order)

- Academy of Management Executive
- Harvard Business Review
- Journal of Business Research
- Journal of International Business Studies (AIBA)

	• Long Range Planning (EIBA) • Strategic Management Journal (SMS)

QUANTITATIVE METHODS FOR MAKING BUSINESS DECISIONS

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	Quantitative Methods for Making Business Decisions		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
Lectures – Solutions of Examples and Problems – Use of EXCEL and MINITAB (Statistical Package)	3 HOURS	7

TYPE OF MODULE	COMPULSORY
PROREQUISITE MODULES:	NO
LANGUAGE OF TEACHING AND TESTING:	GREEK
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	https://eclass.uth.gr/modules/document/?course=ECON_P_143

2. LEARNING OUTCOMES

Learning Outcomes

Upon successful completion of the course, postgraduate students will be able to:

(a) Integrate additional information collected from sampling surveys into the decision-making processes, thus proposing improved decisions regarding the operational problem under consideration and determining at the same time the monetary value of the additional information.

(b) Distinguish between nominal and effective interest rates in compounding, determine the future and present value of an annuity, and construct tables showing (a) Schedule of sinking funds and (b) loans amortization schedule.

(c) Construct linear programming models for problems referring to product selection, identification of transport/transhipment networks, investment portfolio planning and selection, and financial

planning, solve these models using SOLVER of EXCEL, and perform the necessary analysis for writing the appropriate management report at a consulting level.
(d) Construct and solve discrete event simulation models for service systems by defining the logical/physical conditions which determine the time evolution of the system, identifying category "B" and "C" activities, and generating artificial observations of activities duration by generating random numbers from statistical probability distributions.

General Competencies

Postgraduate students will acquire the following general competencies:

(a) Understand the necessity of using quantitative methods for decision-making processes in businesses and organizations.

(b) Understand the concepts of time value of money and the effective management of funds.

(c) Understand the processes of constructing, solving, and analyzing mathematical models describing quasi-real operational and financial decision-making problems.

(d) Understand capabilities, comparative advantages, and conditions/limitations of using the proper quantitative method according to the nature of the operational/financial problem and the decision to be taken.

3.MODULE CONTENT

PRIOR – POSTERIOR ANALYSIS IN DECISION MAKING
Payoff tables, Decision making criteria under risk conditions, Applications of the maximum expected payoff and the minimum expected opportunity losses criteria, Prior analysis and expected value of perfect information, Law of total probability and the Bayes theorem, Types of additional information collected from sampling surveys, Posterior analysis using the Binomial distribution, the Poisson distribution, and the Normal distribution, Posterior expected value of perfect information, Expected value of sample information.

FINANCIAL MATHEMATICS
Time value of money and the interest rate, Compound interest, Equivalence of amounts, Future (Maturity) value of an amount, Present value of a future amount and the discount factor, Determination of time and interest rate in compounding, Nominal and Effective interest rates, Ordinary annuities and Annuities due, Term of an annuity, Payment period, Future value of an annuity and determination of the payment amount, Schedule of sinking funds, Present value of an annuity and determination of the annuity term, Lump sum payment of loans, Amortizing loans and loans amortization schedule.

LINEAR PROGRAMMING
The concepts of activity, limited resources, and objective function in operational/financial linear programming problems, Process of formulating a linear programming model – determination of decision variables – construction of the objective function and constraints of the problem, Entering the linear programming model into EXCEL, Solve the problem using SOLVER, Optimal solution and sensitivity analysis regarding changes (a) in the coefficients of variables in the objective function and (b) in the quantities on the right hand-side of constraints, Applications to problems referring to product selection, identification of transport/transhipment networks, investment portfolio design and selection, and financial planning.

DISCRETE EVENT COMPUTER SIMULATION IN SERVICE SYSTEMS
Forms and examples of service systems – general notation, Arrival/service distributions and the Poisson law, Operational factors for service systems, Fitting the Poisson distribution to empirical

arrival/service distributions, Discrete event simulation principles, Simulation of the M/M/1:GD/∞/∞ system, Generation of random numbers from probability distributions using EXCEL and MINITAB, Table of the system time evolution, Estimation of average waiting times in the queue and in the system.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD

Post graduate students will attend lectures either by face-to-face meetings or by using synchronous distance education methods

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

The learning process is supported through the use of (a) the electronic platform e-class, the institutional email, and the online classroom of the course on the MS-TEAMS platform, and (b) Microsoft EXCEL and MINITAB (statistical package).

ORGANISATION OF TEACHING

The lectures are delivered in the classrooms of the Department of Economics through the use of Microsoft Office 365 tools (Word, EXCEL, Power-Point). Before each lecture, slides and supporting material have already been posted on the course electronic platform "e-class", so that students can have access to them during the lecture. The existing technological equipment of the above rooms also enables the use of an electronic whiteboard through a WACOM device, which allows writing in presentations and texts with storage capabilities of rich texts and presentations. The enriched texts containing comments on the lectures and solutions to exercises and problems are also posted in the e-class after the end of each lecture. This uploaded material on e-class includes also files containing additional problems and exercises that students are invited to solve in order to practice and understand the taught material. Solutions and comments on these problems are given either during lectures or during office hours announced by the teacher responsible (in special cases even via e-mail using students' institutional accounts)

More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Study at home	110
	Completion of assignments	35
	Preparation for the final exam	24
	Final Examination	2
	Total	210

MODULE ASSESSMENT

FIRST SEMESTER EXAMINATION PERIOD

Individual/group work: 30%

	Written exam: 70% **REPEAT EXAMINATION** Written exam: 100%
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	– Anderson, D.R., Sweeney, D.J., Williams, T.A., Martin, K., (2014), "*Management Science – Quantitative methods for Making Business Decisions*", *KRITIKI Publication.* – Efthymoglou, P., Eleftheriadis, I., (2017), "*Financial Mathematics and elements of Insurance Mathematics*", 4th Edition, BROKEN HILL PUBLISHERS LTD. – Prastakos, G., (2006), "*Management Science, Business Decision Making in the Information Society*", B΄ Edition, STAMOULIS Publication. – Taylor, B.W. (2018), "*Introduction to Management Science*", BROKEN HILL PUBLISHERS LTD.

FORECASTING METHODS

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		SEMESTER OF STUDY	A
MODULE TITLE	Forecasting Methods		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS
		3 HOURS	7
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND TESTING:	GREEK		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO		

MODULE'S URL	eclass.uth.gr

2. LEARNING OUTCOMES

By attending and successfully completing the course, students will ideally be able to:

- understand and apply forecasting models as appropriate.
- The modelling of forecasting models and models of forecasting models, through which to aim to reproduce the mechanism by which the forecasting mechanism is reproduced.
- the mechanism by which observations of the data are generated.
- specify models.
- assess, test and evaluate forecasting models.
- analyse case studies and provide solutions to data problems.

General Competencies

- Search, analysis and synthesis of data and information, using the necessary technologies.
- Decision-making
- Autonomous work
- Group work
- Working in an interdisciplinary environment
- Project planning and management

3.MODULE CONTENT

1. Basic Concepts and Forecasting Models

- Introductory concepts in econometrics
- Importance of forecasting, forecasting categories, introduction to time series analysis
- Basic characteristics of time series (Trend, Seasonality, Series decomposition into components, Determinant and Stochastic Trend subtraction, Hodrick-Prescott (HP) filter)
- Two Basic Concepts: Stochastic Processes & Stationary Stochastic Processes
- Univariate Models (Long-term Persistence, Monadic Roots, ARMA(p,q) and ARIMA(p,d,q) models, Box Jenkins Methodology, Basic Control Framework, Spectral Density Function, Conditional Heteroscedasticity, Predictions with ARMA(p,q) and ARIMA(p,d,q) models

2. Advanced Forecasting Methods: Non-Random Models

- Non-Linear Time Series Models (ARCH-GARCH Type Models, Bi-linear Models, Auto-parallel Threshold Models, Smooth State Transition Models, Multiple State Models, Technical Neural Network Models)
- Non-Randomness Check of Time Series
- Evaluation of Non-Random Models
- Forecasting with Non-Random Models
- Non-linearity and Chaos
- Multivariate Models

2. Multivariate Models

- Vector Autoregressive Models (VAR), Estimation of VAR Models and Causality Tests, Forecasting with Vector Autoregressive Models (VAR), Cointegration between Two or Multiple Variables, Testing for Cointegration with Engle Granger and Residual Method, Checking Degree of Integration with Johansen's Method,
- Error Correction Models, Estimation of Error Correction Models (ECM), Cointegration in Multivariate Systems - VECM Models)
- Panel Time Series Models (Panel Data Modelling - Fixed Effects and Random Effects Models, Hausan Test, Unit Root Tests on Panel data, Cointegration on Panel data,

Dynamic Cointegration Models on Panel Data, Estimation of Models on Panel Data, Heterogeneity of Slope Coefficients on Panel Data,

- Panel Vector Autoregressive Models (VAR))

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support of the learning process through the e-class platform. Use of email, MSTEAMS
ORGANISATION OF TEACHING	The delivery of the course takes place in the classrooms of the Department of Economics. Information material is distributed through the course page on the e-class. More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Study at home	80
	Completion of assignments	50
	Preperation for the final exam	39
	Final Examination	2
	Total	210

MODULE ASSESSMENT	Students are assessed through a written examination which includes short answer questions and a set of three group projects. The final grade is determined as follows: Assignments (3 Group Assignments) 60% Final Examination 40% (3 groups of group work (3 groups)) 40% (3 groups) Total 100%

5. RECOMMENDED BIBLIOGRAGHY

Suggested Bibliography:

Anagnostou, A. (2022). Classical & Modern Models of Time Series, Kallipos, Volume A. Open Academic Publications.

Anagnostou, A. (2023). Classical & Modern Models of Chronological Series Volume B. Kallipos, Open Academic Publications. ¬

Demeli Sophia (2012), Modern Methods of Chronological Series Analysis, Kritiki Publications.

Katos A. V. (2004). Econometrics: theory and applications. Theory, Theory, Theory and Methodology.

Siriopoulos, K., (1998), Analysis and tests of univariate financial time series, Typothito Publications, Athens, Greece.

REASEARCH METHODOLOGY SEMINAR I

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		SEMESTER OF STUDY	A
MODULE TITLE	Research Methodology seminar I		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS
			2
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND TESTING:	GREEK		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO		
MODULE'S URL	eclass.uth.gr		

2. LEARNING OUTCOMES

Students will be able to do the following:

- To plan a proper design of a research as well as the identification of the central question and the relative assumptions is a necessary precondition for the scientific analysis of any social and economic phenomenon.
- To implement several research methods that based on (i) specific principles and concepts, (ii) selection of appropriate research tools concerning the preparation and implementation of the research (collection and organization of information in databases, sample, sampling procedures, questionnaires, and interviews) and finally (iii) tools and methods for evaluation and analysis of the collected data / information.
- To understand the practice of empirical scientific research which, under an appropriate methodological design, ensures objective measurements and estimations of the examined phenomena and allows the systematic verification of the research's hypotheses.

General Competencies

- Research and analysis of complicate data with the use of the appropriate methods and tools
- Capacity to develop autonomous work
- Capacity to develop team work
- Working in a multidisciplinary environment
- Production of new innovative research ideas

3.MODULE CONTENT

The primary objective of this course is to provide students with adequate knowledge on the logical path of scientific research and the choice of appropriate methods – tools for the analysis of the potential development issues. This specialized knowledge gives to students the opportunity both

to design and implement a research and to acquire critical thinking necessary to solve complex issue and problems.

Consequently, the course includes the following:
1. Concepts, principles, importance and purposes of scientific research
2. Identification and formulation of the central problem (research question) and of the assumptions
3. Investigation of the field, literature research
4. Structuring the analysis concerning, investigation of data resources: central assumptions, main themes for investigation, identification of quantitative and / or qualitative variables in the model, selection of appropriate research method
5. Specificities of primary and secondary research, search and selection of data sources
6. Implementation of tools for primary research: sample, sample size, sampling methods, alternative forms of questionnaires, coding questions..
7. Data entry technics and reliability tests
8. Statistical analysis of data: (a) simple exploratory statistical analysis, (b) advanced exploratory analysis: Exploratory Factor Analysis (EFA) and Principal Component Analysis (PCA), (c) Confirmatory Factor Analysis (CFA), (d) regression and projections
9.Verification of the main assumptions of the model, discussion on the findings as regards existing theories and approaches, drawing conclusions.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Mixed (face to face and hybrid)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	➢ Use of e-platform, e-class ➢ Use of Ms-Teams programme
ORGANISATION OF TEACHING	More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	20
	Study at home	15
	Completion of assignments	15
	Total	50

MODULE ASSESSMENT	Final grade is derives from: Writing a scientific assignment (100%) 4.000-6.000 words based on Scientifics articles

5. RECOMMENDED BIBLIOGRAGHY

Suggested Bibliography:

- Brotherton, B. (2008) Researching Hospitality and Tourism: A Student Guide, London και Thousand Oaks: Sage.
- Δαφέρμος, Β. (2013), Παραγοντική ανάλυση: Διερευνητική με SPSS και επιβεβαιωτική με το LISREL και το AMOS, Θεσσαλονίκη: Ζήτη.
- Ζαφειροπούλος, Κ. (2005), Πως γίνεται μια επιστημονική εργασία; Αθήνα: Κριτική.
- Finn, M., Elliott-White, M., Walton. M. (2000) Research Methods for Leisure and Tourism, Harlow: Pearson Education.
- Grawitz, M. (2006), Μέθοδοι των κοινωνικών επιστημών, Τόμος Α' και Β', Αθήνα: Οδυσσέας

2nd Semester

BUSINESS ANALYTICS		
ΜΑΘΗΜΑΤΑ	**ΕΙΔΟΣ ΜΑΘΗΜΑΤΟΣ**	**ECTS**
Supply Chain and Inventories	COMPULSURY	7
Money and Capital Markets	COMPULSURY	7
Modelling in Business Analytics	COMPULSURY	7
Selective Module *	SELECTIVE	7
Research Methodology Seminar II	COMPULSURY	2

SELECTIVE MODULES 2ND SEMESTER IN BUSINESS ANALYTICS		
MODULES	**TYPE OF MODULE**	**ECTS**
Financial Accounting	SELECTIVE	7
Measurement of Productivity and Efficiency	SELECTIVE	7
Systems Dynamic	SELECTIVE	7

SUPPLY CHAIN AND INVENTORIES

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**B**
MODULE TITLE	Supply Chain and Inventories		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
Lectures – Solutions of Examples and Problems – Use of EXCEL and MINITAB (Statistical Package)	3 HOURS	7

TYPE OF MODULE	COMPULSORY
PROREQUISITE MODULES:	NO
LANGUAGE OF TEACHING AND TESTING:	GREEK
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	https://eclass.uth.gr/courses/ECON_P_129/

2. LEARNING OUTCOMES

Learning Outcomes

Upon successful completion of the course, postgraduate students will be able to develop:

(a) Optimal ordering policies between retailer and supplier in the case of constant (or approximately constant) demand from end-consumers under alternative combined transport scenarios and different price discounts policies.

(b) Optimal ordering programs between successive stages of supply chains with known time-varying demand by applying the Wagner-Whitin method in the planning horizon.

(c) Optimal ordering policies for A-class products by applying continuous review inventory models with discrete demand and computing the expected fixed, holding and shortage costs in the reference period under either complete backordering or complete lost sales conditions.

(d) The time evolution and evaluation of a two stage supply chain when (i) demand from end-consumers is generated by $ARMA(p,q)$ models, (ii) the order up to level (OUT) policy is adopted for stock replenishment, and (iii) alternative information sharing programs are applied between the stages of supply chains.

General Competencies

Postgraduate students will acquire the following general competencies:

(a) To understand the processes of developing inventory systems in supply chains.

(b) To become familiar with the use of optimal methods for determining the order quantity and the reorder point under different demand patterns from end consumers.

(c) To implement and evaluate information sharing programs between stages of a supply chain.

3.MODULE CONTENT

INVENTORY MANAGEMENT IN SUPPLY CHAINS
Importance of stocks in supply chains, Demand patterns (known and deterministic, known but time varying, random), Process of developing an inventory system, Stock Keeping Unit (SKU), Inventory cycle, Lead time, Fundamental categories of costs – Set-up and variable cost of replenishing stocks – inventory and shortage cost per item unit per time period, Lost sales environment, Backorders, the Bullwhip Effect and its impact on supply chain performance, Coordination in supply chains, Managerial mechanisms to improve coordination, Classifications of products to Class A – Class B – Class C items (A–B –C analysis).

MANAGING ECONOMIES OF SCALE IN SUPPLY CHAINS
Average flow time of products in a supply chain, Quantity in a lot or batch size, Cycle inventory, Little's Law, Economic Order Quantity model (EOQ), Deliveries with zero lead time and reorder point, Optimal inventory policies when (a) multiple products are ordered and delivered either independently or jointly, and (b) Lots are ordered and delivered jointly for a selected subset of products, Placing orders under quantity discounts – discounts offered on the quantity ordered in a single lot – marginal unit discount pricing schedules (multi-block tariffs), Optimal order quantities in a two stage supply chain minimizing (a) Retailer cost, and (b) supply chain total cost, Lot sizing for individual items with known but time-varying demand, Planning horizon, Exact solutions using the Wagner-Whitin method, Applications in EXCEL.

CONTINUOUS REVIEW WITH DISCRETE RANDOM DEMAND
The concept of discrete random variable, Probability distribution, Cumulative distribution function, Expected value of discrete random variable, Poisson distribution, Continuous review with discrete demand, On-hand and net stock, Replenishment policies under (a) Complete backordering and (b) Complete lost sales, (R,Q) continuous review inventory system, Safety Stock, Cycle service level, Alternative methods of determining the order quantity, Q, and the reorder point, R, Computation of expected costs in the reference period concerning (a) stock replenishment, (b) inventory carrying, and (c) shortage of stocks, Optimal inventory policies, Applications in EXCEL.

TIME EVOLUTION OF SUPPLY CHAINS UNDER NORMAL DEMAND AT THE RETAILER

$ARMA(p,q)$ demand models at the retailer, Minimum Mean Square error (MMSE) forecasts for demand, Order up to level (OUT) policies for stock replenishment, Forecast errors for demand, Target inventory level, Time evolution of retailer's orders – quantification of Bullwhip effect, time evolution of supplier's order to the manufacturer – the scenarios of full information sharing (FIS) and No information sharing (NIS), Average on hand inventory per time period, Benefits of retailers and suppliers in information sharing programs, Applications in EXCEL.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD

Post graduate students will attend lectures either by face-to-face meetings or by using synchronous distance education methods.

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

The learning process is supported through the use of (a) the electronic platform e-class, the institutional email, and the online classroom of the course on the MS-TEAMS platform, and (b) Microsoft EXCEL.

ORGANISATION OF TEACHING

The lectures are delivered in the classrooms of the Department of Economics through the use of Microsoft Office 365 tools (Word, EXCEL, Power-Point). Before each lecture, slides and supporting material have already been posted on the course electronic platform "e-class", so that students can have access to them during the lecture. The existing technological equipment of the above rooms also enables the use of an electronic whiteboard through a WACOM device, which allows writing in presentations and texts with storage capabilities of rich texts and presentations. The enriched texts containing comments on the lectures and solutions to exercises and problems are also posted in the e-class after the end of each lecture. This uploaded material on e-class includes also files containing additional problems and exercises that students are invited to solve in order to practice and understand the taught material. Solutions and comments on these problems are given either during lectures or during office hours announced by the teacher responsible (in special cases even via e-mail using students' institutional accounts)

More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Study at home	110
	Completion of assignments	35
	Preperation for the final exam	24
	Final Examination	2
	Total	210

MODULE ASSESSMENT	**FIRST SEMESTER EXAMINATION PERIOD** Individual/group work: 30% Written exam: 70% **REPEAT EXAMINATION** Written exam: 100%
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	– Chopra, S., (2021), "*Supply Chain Management*", TZIOLA, A., *PUBLICATIONS, & SONS S.A.* – Cristofer, M., (2017), "*Logistics and Supply Chain Management*", KRITIKI Publication. – Silver, E.A., Pyke, D.F., Thomas, D.T., (2021), "*Inventory and Production Management in Supply Chains*", 4th Edition, CRC Press. – Thomopoulos, N.T., (2015), "*Demand Forecasting for Inventory Control*", Springer.

MONEY AND CAPITAL MARKETS

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	MONEY AND CAPITAL MARKETS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
Lectures – Exercises - Case Studies	3 HOURS	7

TYPE OF MODULE	ELECTIVE
PROREQUISITE MODULES:	NO
LANGUAGE OF TEACHING AND TESTING:	GREEK
THE MODULE IS	NO

OFFERED TO ERASMUS STUDENTS	
MODULE'S URL	eclass.uth.gr

2. LEARNING OUTCOMES

Learning Outcomes

The aim of the course is to delve into the issues of the money and capital markets in order to provide the possibility of a more complete understanding of the ways in which capital markets work and how investment strategies are developed. Upon successful completion of the course requirements, students are expected to:

• understand the distinction between real and financial assets

• understand how the money and the capital markets work

• understand how investment companies and mutual funds work

• analyze portfolios of securities and measure their performance and risk

• understand capital markets products and their valuation methods

• develop investment strategies

• apply computer aided methods of market reflection, such as technical analysis.

• formulate original ideas and express them in the form of research papers.

General Competencies

The course presents specialized topics in the field of money and capital markets. Basic financial instruments and investment strategies that can be developed in the modern financial environment are studied. Topics related to securities valuation and portfolio structuring are analyzed. Special emphasis is also placed on investment companies, behavioral finance, and technical analysis. Students acquiring this knowledge will have the necessary skills to work in financial institutions and international organizations, as well as in investment companies.

3.MODULE CONTENT

The course will cover the following subjects:

Introduction to the Financial Environment - Asset classes and financial instruments

• The concept of investment.

• Distinguish between real and financial assets

• Risk-return trade-off and efficient valuation

• Financial crisis of 2008 - Relationships between the financial system and the "real" side of the economy

• Investing in securities: Money market vs capital market. Equity securities, debt securities, derivative products.

Investment Decision Process and Investment Strategies – Return / Risk – Investment Companies and Mutual Funds

• The fundamentals of risk and return. Degree of risk aversion.

• Open-end and closed-end funds, ETFs

Principles of Portfolio Management.

• Markowitz's Portfolio Theory.

• The concept of diversification.

Capital Markets and Asset Pricing

• Capital market theory (CAPM, APT, Fama-French models)

• The hypothesis of the efficient Market (Market Efficiency)

Gold as an investment product

• Gold derivatives

• The main characteristics and factors affecting the demand and supply of gold are presented.

•Special reference is made to the role of gold in an investment portfolio as a hedger or diversifier of risk.

Behavioral Finance & Technical Analysis

• Presentation of the basic principles of behavioral finance

• Development of technical systems to produce buy and sell signals for securities trading.

Bond Valuation and Bond Portfolio Management

• Types of bond securities.

• Valuation of Bonds

• Bond Portfolios

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Mixed
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process support through the e-class online platform. Email usage, MSTEAMS.
ORGANISATION OF TEACHING	The lectures of the course take place in the halls of the Department of Economic Sciences. Informational material is distributed through the course page in the e-class, case studies are discussed, exercises are solved, and various videos are analyzed related to applications of theory in practice. More specifically, the workload of the course is broken down as follows: (indicative)

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Study at home	80
	Completion of assignments	50
	Preparation for the final exam	39

	Final Examination 2 Total 210
MODULE ASSESSMENT	Assignment 40% Final Exams 60%
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	• Bodie Zvi, Kane Alex, Marcus Alan J. (2014) Investments, Edition Utopia • Lim Mark Andrew (2023) A Complete Guide for Technical Analysis BROKEN HILL PUBLISHERS LTD. Editing In Greek Papadamou, S. and Fassas, A. • Laopodis, N. (2012). Understanding investments: theories and strategies. Routledge. • Papadamou, S. (2009), Portfolio Management: A modern guide Edition Gutenberg - Rajib, P. (2014). Commodity derivatives and risk management. PHI Learning Pvt. Ltd..

MODELLING IN BUSINESS ANALYTICS

1.GENERAL			
FACULTY	FACULTY OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER**	**A**
MODULE TITLE	Modelling in Business Analytics		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures - Exercises - Workshops		3 HOURS	7
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND TESTING:	GREEK		

THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	eclass.uth.gr

2. LEARNING OUTCOMES

Learning Outcomes

Upon completing the course, participants are expected to:

1. Understand advanced mathematical methods.
2. Grasp the complexity of an economic model.
3. Utilize various tools of contemporary techniques.
4. Distinguish the similarities and/or differences between models in Physics and Economics.

General Competencies

The purpose of this course is to introduce students to Dynamical Systems and the new techniques used in the study of economic models. Having considered a substantial number of economic dynamic models, we will attempt to answer the question: "What mathematical concepts are needed to understand these models?" For this reason, we have emphasized concepts primarily used in modern Dynamical Systems research, such as phase space, stability, bifurcations, attractors, and chaos. The study of dynamic economic models underwent slow development due to significant mathematical and computational requirements. The advancement of computers and suitable software packages have made it easier for economists to explore dynamic systems. In the course, we will make use of some of the contemporary and powerful tools of quantitative research, such as Excel and Maxima.

3.MODULE CONTENT

Continuous Dynamical Systems, Discrete Dynamical Systems, First-order Differential Equation Systems, Discrete Equation Systems, Optimal Control Theory, Chaos Theory, Applications of the above in Supply and Demand Models, Closed Economy Dynamics, and the Dynamics of Inflation and Unemployment.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Mixed
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support for the learning process will be provided through the e-class electronic platform. Communication will take place via email and Microsoft Teams. Additionally, the computational mathematics program "Maxima" will be used as part of the course.
ORGANISATION OF TEACHING	More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD

	(HOURS)
Lectures	39
Study at home	80
Completion of assignments	50
Preparation for the final exam	39
Final Examination	2
Total	210

MODULE ASSESSMENT	The grading for the course will be based on either two practical assignments, with a weight of 40% for the first and 60% for the second, or a single final project worth 100%.
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	Ζαχείλας Λουκάς: «Υπολογιστικές Μέθοδοι με τη χρήση του Maxima», (Σημειώσεις), 2011 Λουκάκης Μανώλης: «Μαθηματικά Οικονομικών Επιστημών», Τόμος Β' (Κεφ. 18 – 24), εκδόσεις ΣΟΦΙΑ Σαραφόπουλος Γ. & Μυλωνάς Ν.: «Γραμμική Άλγεβρα, Βελτιστοποίηση και Δυναμική Ανάλυση στις Οικονομικές Επιστήμες», εκδ. Α. Τζιόλα Bertuglia, Cristoforo and Vaio, Franco (2005): «Nonlinearity, Chaos & Complexity», εκδόσεις Oxford University Press Gandolfo, Giancarlo (2005): «Economic Dynamics: Study edition», εκδόσεις Springer-Verlag Kaplan, Daniel and Glass, Leon (1995): «Understanding Nonlinear Dynamics», εκδόσεις Springer-Verlag Puu, Tönu (2003): «Attractors, Bifurcations and Chaos. Nonlinear Phenomena in Economics», εκδόσεις Springer-Verlag. Shone, Ronald (2002): «Economic Dynamics. Phase diagrams and their Economic application», εκδόσεις Cambridge University Press.

RESEARCH METHODS SEMINAR II

1.GENERAL	
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS
DEPARTMENT	DEPARTMENT OF ECONOMICS

LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	Research Methods Seminar II		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures and hands-on training		3 HOURS	2
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	Research Methods Seminar I		
LANGUAGE OF TEACHING AND TESTING:	GREEK		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO		
MODULE'S URL	https://eclass.uth.gr/courses/ECON_P_190/		

2. LEARNING OUTCOMES

Learning Outcomes

This seminar provides a comprehensive introduction of statistics for business and economics and an intensive, hands-on introduction to the principles and practice of data visualization. As a result of taking this course, the students should be able to: 1. Apply and interpret descriptive statistics. 2. Formulate, identify and apply inferential statistics. 3. Analyse the association of variables using regression and ANOVA analyses. 4. Conduct empirical work using statistical software and interpret results 5. Take their data from Excel into visualization software, transform it to easy-to-understand dynamic graphics and interactively explore what-if scenarios.

General Competencies

This course provides the elementary foundations in statistics as well as the prerequisites for understanding the trends and challenges in data analysis and visualization.
The students will find the resources to learn the science behind data analysis, how businesses use data to their advantage. Utilizing the tools that support Business Intelligence can give organizations an edge, letting them make better, data-driven decisions.

3.MODULE CONTENT

Learning module 1: Statistical analyses using statistical package IBM SPSS Statistics

- Data import, data management
- Quantitative and qualitative variables, attributes, scales of measurement (nominal, ordinal, interval and ratio).

- Importing a survey questionnaire to SPSS
- Data Presentation: tabular and graphical. Statistical charts, crosstabulation and independence of data with special reference to attributes. Coding, missing values, conditional and arithmetic operations.
- Descriptive statistics: measures of central tendency, measures of dispersion.
- Inferential statistics. Basic statistical tests in SPSS. T-tests, analysis of variance (ANOVA), Chi-square test and contingency tables.
- Bivariate data: Definition, scatter diagram, simple, partial and multiple correlation, determine the strength of the correlation via the correlation coefficient. Simple and multiple linear regression. Multiple linear regression assumptions and diagnostics.

Learning module 2: Visual analytics

- Basic plotting and visualization. Statistical and specialty plots in Business Intelligence and Analytics Software Tableau.
- Best practices for creating different plot types, motion charts, interactive visualizations.
- Building, sharing and customizing automated reports including data, text and graphics.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	In situ and online lectures with hands-on computer training classes.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Teaching and learning process will be enhanced by eclass, email and MSTEAMS. Software licenses (IBM SPSS Statistics and Tableau latest versions) are offered to students at the beginning of the course. After completing the course, students have free one-year Tableau licenses through "Tableau for Students software licensing program".
ORGANISATION OF TEACHING	The hands-on training is conducted in the Computer Lab. Hands-on exercises and relevant materials (software user manuals, e-books, dictionary of statistical terms, white papers) will be provided for students to try out the applications, and to experiment with data analysis and interpretation and analytical reasoning in reports. More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Study at home	10
	Completion of assignments	-
	Preparation for the final exam	9
	Final Examination	2

	Total 60
MODULE ASSESSMENT	Online exam in the classroom
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	- Aljandali A. (2016). Quantitative Analysis and IBM® SPSS® Statistics. A Guide for Business and Finance. Springer Cham. Hardcover ISBN 978-3-319-45527-3 (e-book) - Cleophas, Ton J., Zwinderman, Aeilko H. (2015). SPSS for Starters and 2nd Levelers. Springer International Publishing, ISBNs 978-3-31-920599-1, 978-3-31-920600-4. (e-book) - Martin Lee Abbott (2016). Using Statistics in the Social and Health Sciences with SPSS® and Excel®. John Wiley & Sons, Inc. Print ISBN: 9781119121046 Online ISBN: 9781119121077 - Lind D. and Marchal W. and Wathen S. (2018). Statistical Techniques in Business and Economics, 17th Edition, McGraw Hill Education.

Selective Modules

FINANCIAL ACCOUNTING

1. GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**B**
MODULE TITLE	FINANCIAL ACCOUNTING		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures – problems - calculations		3 hours	7
TYPE OF MODULE	COMPULSORY		
PREREQUISITE MODULES:	No		
LANGUAGE OF TEACHING AND TESTING:	Greek		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	No		
MODULE'S URL	eclass.uth.gr/		

2. LEARNING OUTCOMES

Learning Outcomes

After successfully completing the lessons, students should be able to:

- Compose the financial accounts (balance sheet, income statement, and cash flow statement)
- Analyze and register accounting events and transactions
- Be accustomed with evaluating inventories
- Be accustomed with financial reporting of tangible and intangible fixed assets
- Conduct consolidation of financial statements

General Competencies

The course of 'Financial Accounting' aims to familiarize the students with accounting tasks, registration of transactions in accounts, and the overall accounting system. The main purpose of this course is to learn to the students the procedure of composing the main financial accounts, I.e. the balance sheet, the income statement, and the cash flow statement. Finally, this course presents the procedure of consolidation of financial statements.

3. MODULE CONTENT

Analysis and accounting entry of transactions in book accounts

Composing balance sheets and Income Statements

Composing Cash Flow Statements

Inventories valuation

Tangible fixed assets

Intangible fixed assets

Consolidation of financial statements

Valuation of financial statements

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	In person and online
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Teaching is supported by the e-class platform. Use of email, MSTEAMS
ORGANISATION OF TEACHING	Teaching takes place in the classes of the Department of Economics. Informative material is distributed through the course's e-class webpage. More specifically, the workload can be divided as indicated below:: Type / Description / WORKLOAD (HOURS) Lectures — 39 Study at home — 80 Completion of assignments — 50 Preparation for the final exam — 39

	Final Examination	2
	Total	210
MODULE ASSESSMENT	Assessment by: - group assignment: 30% - exam: 70%	
5. RECOMMENDED BIBLIOGRAGHY		
Suggested Bibliography:	- Gikas Dimitrios and Afroditi Papadaki, «Financial Accounting», Benos editions. - Hevas Dimosthenis and Apostolos Ballas, «Financial Accounting», Benos editions. - Elliott, B. and J. Elliott, «Financial Accounting and Reporting», Pearson Education. - Harrison W., C. Horngren and W. Thomas, «Financial Accounting», Broken Hill Publishers.	

MEASUREMENT OF PRODUCTIVITY AND EFFICIENCY

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**B**
MODULE TITLE	MEASUREMENT OF PRODUCTIVITY AND EFFICIENCY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures - Exercises - Actions		3 HOURS	7
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND TESTING:	GREEK		

THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	eclass.uth.gr

2. LEARNING OUTCOMES

Learning Outcomes

The course aims to provide students with the tools of applied economic analysis to be able to answer the following questions:

• How can I determine the production function of an economic unit?

• How can I measure the technical efficiency of organizations and other economic units?

• How can I measure the productivity of organizations and other economic units?

• How can I identify and propose optimization goals for the production process of organizations and other economic units?

This course is designed to equip students with the knowledge and analytical skills necessary to address these questions in the context of economic analysis and optimization.

General Competencies

The student will have the ability to measure productivity and efficiency using the Data Envelopment Analysis (DEA) method. They will also be able to recognize, understand, and create Malmquist productivity indices and apply the measurement of technical efficiency to organizations and economic units such as banks, hotels, hospitals, and others.

This indicates that the student will acquire skills related to advanced economic analysis techniques, particularly in the context of productivity and efficiency measurement in various types of organizations and economic entities.

3.MODULE CONTENT

The course consists of lectures with a particular emphasis on applied specialized topics in the economics of production. The central aim of the course is to understand fundamental concepts of economic production, with an emphasis on learning and applying methodologies for measuring productivity and efficiency in economic units and organizations.

• Basic introductory concepts related to technology and scale efficiency.

• Profit maximization theory and scale efficiency.

• Production theory and production frontier analysis.

• Parametric and non-parametric approaches to measuring production efficiency.

• Measurement of productivity using the Malmquist index.

This course covers a range of topics related to the economics of production, focusing on practical applications and measurement methodologies for productivity and efficiency in various economic units and organizations.

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD

in-person and remote activities or learning (hybrid)

USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES

"Supporting the learning process through the e-class electronic platform. Using email and Microsoft Teams."

This statement indicates the use of electronic platforms and communication tools like email and Microsoft Teams to facilitate and enhance the learning process.

ORGANISATION OF TEACHING

More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Study at home	80
	Preperation for the final exam	90
	Final Examination	1
	Total	210

MODULE ASSESSMENT

100% Individual Presentation of a Scientific Article.

5. RECOMMENDED BIBLIOGRAGHY

Suggested Bibliography:

- Coelli, TJ, Rao, D.S.P., O'Donnell CJ, Battese GE. (2005). An introduction to efficiency and productivity analysis, Second edition, Springer.
- Ray, S. C. (2004). Data envelopment analysis: theory and techniques for economics and operations research. Cambridge university press
- Varian R. H. (1992). Microeconomic Analysis, Third edition, Norton.

SYSTEM DYNAMICS

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	Applications of System Dynamics in Economics and Management		

INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS	ECTS
	3 HOURS	7

TYPE OF MODULE	COMPULSORY
PREREQUISITE MODULES:	NONE
LANGUAGE OF TEACHING AND TESTING:	GREEK
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	eclass.uth.gr

2. LEARNING OUTCOMES

Learning Outcomes

In this course, students learn to apply the System Dynamics (SD) methodology to economic and management problems. SD is used to model and simulate dynamic problems in both social and physical systems.

Upon successful completion of the course, students will:

- Comprehend the fundamental principles of systems thinking and the concepts of emergence, function and performance.
- Identify and describe the relationships between the entities of a system.
- Apply systems thinking to understand complex processes.
- Apply systems thinking to the investigation of administrative, economic and social problems.
- Create systems' models.
- Apply the principles and concepts of SD through a simulation of an administrative,

economic or social problem.

General Competencies

- Systems thinking
- Collaboration in a team context
- Problem definition
- Identifying causal links and feedback loops
- Simulation using software
- Formulation and test of dynamic hypothesis
- Recognition of archetypal feedback structures

3.MODULE CONTENT

Introduction to System Dynamics

Systemic complexity and strategic thinking
Systems thinking with feedback
Systems thinking and modeling tools

The dynamics of growth, development and diffusion

Diffusion models (fashion, innovation, epidemiology)
Marketing applications and brand strategy
Business development

Industrial dynamics

Time lags and path dependence
Socio-technical Transitions (digital, green, etc.)

Economic dynamics

Tragedy of the commons
Crises and economic cycles
Innovation systems
Ecological crisis and climate change

Creating System Dynamics models

Modeling of Dynamic Systems
Simulation of system dynamics models
Dynamic hypothesis formulation
Dynamic hypothesis testing
After the model: testing and calibration, analysis and reflection

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Hybrid/mixed (flexible-learning)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process support through the e-class online platform. Use of email, MSTEAMS
ORGANISATION OF TEACHING	More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39

	Study at home 78 Completion of assignments 50 Preperation for the final exam 40 Final Examination 3 Total 210
MODULE ASSESSMENT	Assignments during the semester 30% Final semester assignment 70%
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	Sterman, J. D. (2000) Business Dynamics: Systems Thinking and Modeling for a Complex World, McGraw-HillGraw-Hill. Morecroft, J. D. (2015). *Strategic modelling and business dynamics: A feedback systems approach*. John Wiley & Sons. Cavana, R. Y., Dangerfield, B. C., Pavlov, O. V., Radzicki, M. J., & Wheat, I. D. (Eds.). (2021). *Feedback Economics: Economic Modeling with System Dynamics*. Cham, Switzerland: Springer.

3rd Semester

3rd Semester	TYPE OF MODULE	ECTS
Dissertation	SELECTIVE	30
ALTERNATIVELY INSTEAD OF DISSERTATION ALL THE FOLLOWING MODULES		
Financial Management	COMPULSURY	7
Technology Strategy	COMPULSURY	7
Economics of Money and Banking	COMPULSURY	7
Applied Economic Analysis	COMPULSURY	7
Research Methodology Seminar III	COMPULSURY	2

DISSERTATION

1.GENERAL		
MODULE TITLE	DISSERTATION	
INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
		30
TYPE OF MODULE	SELECTIVE	
PREREQUISITE MODULES::	MODULES OF 1ST AND 2ND SEMESTER	
LANGUAGE OF TEACHING AND TESTING:	Greek, English	
THE MODULE IS OFFERED TO ERASMUS STUDENTS	No	
MODULE'S URL	eclass.uth.gr/eclass/courses	

2. LEARNING OUTCOMES

The main learning objective to be achieved during the completion of the master's thesis is for the student to develop the necessary knowledge background related to the critical understanding of the subject of the master's thesis, as well as the systematic application of research methodologies and techniques. Specifically, upon completion of the master's thesis, the student should demonstrate that:

• Understands, critically evaluates, and applies techniques for defining and developing a research topic that constitutes a relevant research problem in the field of Applied Economics.

• Selects and formulates specific research objectives and problems that exhibit (to some extent at a master's level) scientific originality and practical relevance.

• Understands and assesses the relationships between research objectives-problems, scientific literature, research methodologies, data collection and analysis techniques, drawing conclusions, and ultimately methods for making managerial decisions.

• Applies research search processes and engages in the critical review of scientific literature relevant to the research topic.

• Conducts research and formulates conclusions that are understandable and lead to interesting results.

• Understands the differences between quantitative research and qualitative research strategies and applies them either independently or in combination, depending on the specific requirements of the research. • Understands the advantages and disadvantages of research techniques, systematically applies research techniques, and documents the choices made. • Relies on primary and/or secondary data, which are evaluated for sufficiency, reliability, and validity. • Formulates understandable and useful conclusions that demonstrate knowledge of the subject and the ability to critically assess other relevant published research results. • Understands and formulates limitations and weaknesses of the research work. • Identifies possible directions for future research in the specific area and in accordance with the initial research objectives, and finally • Broadens their overall knowledge background to enhance further research and professional pursuits.
General Competencies
The postgraduate thesis aims for the student to develop, through a primarily personal research process and under the guidance of the supervisor, a thesis on the chosen subject-object proposed following a relevant proposal. The aforementioned thesis should present: • A clearly defined contribution to the field of Applied Economics, either through the conduct of original research or through the examination and application of relevant theories and methodologies. • A well-documented research methodology and the systematic application and utilization of appropriate techniques for data collection, analysis, and processing. • Comprehensive knowledge of the research subject of the thesis, including the ability to critically evaluate relevant literature.
3. MODULE CONTENT
The research objectives and the content of each postgraduate thesis (Master's thesis) should be relevant to the academic subject of the Master's program (MSc) and should fall within a specific academic field or areas of knowledge. The research methods involve techniques for collecting and processing reliable data, as well as their documentation through scientific methods (e.g., field research, literature review, statistical analysis, etc.).
4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING	During the semester in which the postgraduate thesis (MSc thesis) is being completed, the supervising Professor supports the student by providing, in

<table>
<tr><td>METHOD</td><td>the best guiding manner, the scientific knowledge and expertise in the specific subject of the thesis. This support aims to facilitate the student's gradual progress in writing the thesis.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Supporting the Learning Process through the e-class Electronic Platform</td></tr>
<tr><td>ORGANISATION OF TEACHING</td><td>More specifically, the workload of the course is analyzed as follows:
<table>
<tr><th>Type</th><th>Description</th><th>Workload(hours)</th></tr>
<tr><td>Lectures</td><td>This concerns the lectures and presentations that will take place in the Research Methodology Seminar I & II.</td><td>2*20=40</td></tr>
<tr><td>Preparation of an MSc thesis proposal</td><td>Involves composing the proposal for the MSc thesis.</td><td>20</td></tr>
<tr><td>Preparation of Dissertation</td><td>It concerns the time required for conducting case studies and implementing exercises, as previously mentioned (Assessment Method).</td><td>536</td></tr>
<tr><td>Final Examination</td><td>It concerns the duration of the final examination</td><td>1</td></tr>
<tr><td>Participation in other activities</td><td>Meetings with the Professor for Progress Feedback</td><td>3</td></tr>
<tr><td></td><td>Σύνολο</td><td>600</td></tr>
</table></td></tr>
<tr><td>MODULE ASSESSMENT</td><td>The MSc thesis is presented for public defense by the student. The thesis is evaluated by the supervisor and two assessors, who must collectively agree on the final grade for the postgraduate thesis, which may also be the average of the three grades.

The evaluation criteria for the thesis include:

• The significance of the contribution of the specific research to the academic subject of the MSc program.

• Clear definition and significance of the research objectives.</td></tr>
</table>

	• Understanding of the research subject and the ability to critically evaluate and utilize relevant literature. • Understanding of research methodology, sufficiency of the research methodology, and systematic use of appropriate research techniques. • Completion of the research and the significance of the results and conclusions. • Writing style of the thesis and the technical presentation quality of the work, which should conform to citation style standards. • Presentation and public defense of the thesis.
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	• *Calabrese R. L. (2012), Getting It Right: The Essential Elements of a Dissertation, 2nd Edition, Rowman & Littlefield Education.* • *Cohen L., Manion L., Morrison K. (2007), Research Methods in Education, 6th Edition, London & New York, Routledge.* • *Murray R. (2006), How to Write a Thesis, 2nd Edition, Berkshire, UK, Open University Press.* • *Orna E. & Stevens G. (2009), Managing Information for Research: Practical help in researching, writing and designing dissertations, 2nd Edition, Buckingham, UK, Open University Press.* • *Saunders M., Thornhill M., Lewis, P. (2012), Research Methods for Business Students, 6th Edition, Harlow, Essex, UK, Pearson.* • *Yin R. K. (1994), Case Study Research Design and Methods, 2nd Edition, London & New Delhi, Sage.* • *Bell J. (2007), Πως να συντάξετε μια Επιστημονική Εργασία: Οδηγός Ερευνητικής Μεθοδολογίας, Αθήνα, Εκδόσεις Μεταίχμιο.* • *Eco U. (2001), Πως γίνεται μια Διπλωματική Εργασία, Αθήνα, Εκδόσεις Νήσος.* • *Ζαφειρόπουλος Κ. (2015), Πως γίνεται μια Επιστημονική Εργασία: Επιστημονική Έρευνα και Συγγραφή Εργασιών, Αθήνα, Εκδόσεις Κριτική.* • *Θεοφιλίδης Χ. (2005), Η Συγγραφή Επιστημονικής Εργασίας: Από τη Θεωρία στην Πράξη, Αθήνα, Εκδόσεις Τυπωθήτω-Δαρδανός.* • *Μπέλλας Θ. (1998), Δομή και Γραφή της Επιστημονικής Εργασίας, Αθήνα, Εκδόσεις Ελληνικά Γράμματα.* • *Μπουρλιάσκος Β. Γ. (2010), Πως γράφεται μια Επιστημονική Εργασία: Πρακτικός Οδηγός, Συγγραφή Επιστημονικής Εργασίας και Βιβλιογραφική Έρευνα, Αθήνα, Εκδόσεις Διόνικος.* • *Τοκμακίδης Σ. Π. (2008), Οδηγός για τη Συγγραφή Διπλωματικών Εργασιών, Αθήνα, Ιατρικές Εκδόσεις Π. Χ. Πασχαλίδης.*

Alternatively , instead dissertation the following four modules and the Seminar

FINANCIAL MANAGEMENT

1. GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**B**
MODULE TITLE	FINANCIAL ACCOUNTING		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures – problems - calculations		3 hours	7
TYPE OF MODULE	COMPULSORY, OPTIONAL		
PREREQUISITE MODULES:	No		
LANGUAGE OF TEACHING AND TESTING:	Greek		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	No		
MODULE'S URL	eclass.uth.gr/		
2. LEARNING OUTCOMES			
Learning Outcomes			
After successfully completing the lessons, students should be able to: • Compose the financial accounts (balance sheet, income statement, and cash flow statement) • Analyze and register accounting events and transactions • Be accustomed with evaluating inventories • Be accustomed with financial reporting of tangible and intangible fixed assets			

- Conduct consolidation of financial statements

General Competencies

The course of 'Financial Accounting' aims to familiarize the students with accounting tasks, registration of transactions in accounts, and the overall accounting system. The main purpose of this course is to learn to the students the procedure of composing the main financial accounts, I.e. the balance sheet, the income statement, and the cash flow statement. Finally, this course presents the procedure of consolidation of financial statements.

3. MODULE CONTENT

Analysis and accounting entry of transactions in book accounts

Composing balance sheets and Income Statements

Composing Cash Flow Statements

Inventories valuation

Tangible fixed assets

Intangible fixed assets

Consolidation of financial statements

Valuation of financial statements

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	In person and online
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Teaching is supported by the e-class platform. Use of email, MSTEAMS
ORGANISATION OF TEACHING	Teaching takes place in the classes of the Department of Economics. Informative material is distributed through the course's e-class webpage. More specifically, the workload can be divided as indicated below:: Type / Description / WORKLOAD (HOURS) Lectures — 39 Study at home — 80 Completion of assignments — 50

	Preparation for the final exam 39 Final Examination 2 Total 210
MODULE ASSESSMENT	Assessment by: - group assignment: 30% - exam: 70%
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	- Gikas Dimitrios and Afroditi Papadaki, «Financial Accounting», Benos editions. - Hevas Dimosthenis and Apostolos Ballas, «Financial Accounting», Benos editions. - Elliott, B. and J. Elliott, «Financial Accounting and Reporting», Pearson Education. - Harrison W., C. Horngren and W. Thomas, «Financial Accounting», Broken Hill Publishers.

TECHNOLOGY STRATEGY

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE	**MA_41**	**SEMESTER OF STUDY**	**A**
MODULE TITLE	**Technology Strategy**		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures – Course work		3 HOURS	7
TYPE OF MODULE	COMPULSORY		
PREREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND	GREEK		

TESTING:	
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	eclass.uth.gr

2. LEARNING OUTCOMES

Learning Outcomes

Upon successful completion of the course, students will be able to understand the developments in the modern technology environment and plan appropriate policies and practices for their effective management. Students will be able to:

- Understand the interaction between economics and technology
- Connect theoretical knowledge with technological and business reality
- Recognize the primary importance of innovation and organizational learning
- Understand the world of intellectual property (IP)
- Understand the basic functions of Technology Strategy
- Implement individual tools, policies and practices of Technology Strategy

General Competencies

- Understanding how the theories of Economics of Technology and Technology Strategy apply to the modern economic environment.
- Solving practical problems encountered in the technologically fluid business environment.
- Planning of Technology Strategy policies and practices
- Improving the ability of students to communicate, collaborate and lead on issues of technology and innovation.
- Teamwork
- Perception of the innovative capabilities of the business

3.MODULE CONTENT

Technical change and economic development (Economics of knowledge and innovation: key concepts)

- Innovation and Technical Change
- Industrial and technological revolutions, techno-economic paradigms
- Knowledge, technology, innovation and entrepreneurship
- Diffusion of innovation and path dependence
- Disruptive innovation, Socio-technical Systems and Socio-technical Transition

Economics of technology

- Business knowledge creation process
- Path Dependence and Absorptive Capacity

Technology **Strategy**

- Types of Technology Strategy
- Levels of Technology Strategy Development
- Tools and Methods for Developing Innovative Skills
- Architectural innovation
- Technology platforms and ecosystem strategies
- Modularity
- Product platforms

- Reasons for failure of large companies
- Technology alliance strategies

Technology **and Business strategy**

- Fundamental skills
- Leveraging innovation, complementary assets, and appropriability regimes
- Co-opetitive games and platform strategy

Intellectual Property and exploitation of innovation

The framework for the study and analysis of intellectual property

- Intangible assets:
  - Intangible assets investment
- Intellectual Property Rights (IPRs):
  - Intellectual Property Protection
  - Patents
- IP institutions and mechanisms (OBI, EPO, WIPO, etc.)
- Intellectual Property Management – Strategies

Technology **Strategy Planning**

- Technology Foresight
- Technology Monitoring
- Scenario development and analysis
- Technology Road-Map (TRM)

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Mixed/Hybrid
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process support through the e-class online platform. Use email, MS TEAMS.
ORGANISATION OF TEACHING	The course delivery takes place in the rooms of the Department of Economics. Informational material is distributed through the course page in the e-class platform and the course channel in MS Teams. More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Home study	78
	Completion of assignments	50
	Preparation for final exam	40
	Final Examination	3
	Total	210

MODULE ASSESSMENT	In-course assignments 30% Final course essay 70%

5. RECOMMENDED BIBLIOGRAGHY

Suggested Bibliography:	Bessant J και Tidd J. (2017) Καινοτομία και Επιχειρηματικότητα, 3η Αγγλική Έκδοση, Εκδόσεις Τζιόλα (in Greek)

	Schilling, M. A. (2017) Η Στρατηγική Διοίκηση της Τεχνολογικής Καινοτομίας, 4η Αγγλική Έκδοση, Broken Hil (in Greek)l Tidd J. and Bessant J. (2018) Στρατηγική Διοίκηση Καινοτομίας, Broken Hill (in Greek) White M. and Bruton G. (2010) Η στρατηγική διαχείριση της τεχνολογίας και της καινοτομίας. Κριτική (in Greek) Ξπαής Γ. (2007) Εισαγωγή στη Διαχείριση Τεχνολογικών Καινοτομιών, Κριτική (in Greek) Dodgson M., Gann D.M., and Salter A. (2008) The Management of Technological Innovation, Oxford University Press Dodgson M., Gann D., and Salter A. (2005) Think, Play, Do: Innovation, Technology, and Organization: Technology, Innovation, and Organization, Oxford University Press Nonaka I. and Takeuchi H. (1995) The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation, Oxford University Press

ECONOMICS OF MONEY AND BANKING

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	ECONOMICS OF MONEY AND BANKING		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures – Exercises - Case Studies		3 HOURS	7
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND TESTING:	GREEK		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO		
MODULE'S URL	eclass.uth.gr		
2. LEARNING OUTCOMES			

Learning Outcomes

The aim of the course is to provide the necessary theoretical background in the scientific field of money and banking and to contrast it with reality and practice in the modern financial market. By the end of the course, the student will have gained knowledge about banking administration issues such as the management of bank assets and liabilities, measurement and hedging of banking risks, but also about the role and effectiveness of the central bank in the modern macroeconomic environment.

General Competencies

The course presents specialized topics in monetary and banking economics. It has as its subject the theory and policy of money as it interacts with the various forms of banking activities. The role of banks in the modern environment is studied, the main risks they face, and various ways of reducing these risks are proposed using financial derivatives and other techniques. Emphasis is also placed on issues of central banking theory, such as the importance of banking supervision, the independence of the central bank, the measurement of the effectiveness of monetary policy and the transmission mechanisms of monetary policy in the real economy. Students acquiring this knowledge will have the necessary skills to work in financial institutions and international organizations, as well as in investment companies.

3.MODULE CONTENT

The course will cover the following subjects:

Financial Intermediation and Trends in Domestic and International Banking. Introduction of new technologies in banking management (financial innovation), deregulation and globalization and their effect on banks and their profitability. The role of capital markets in the process of financial intermediation, the determination of the market interest rate and the role of banks in the process of financial intermediation (information asymmetry, transaction costs, ensuring liquidity).

Banking Structures, Bank Performance, output, and efficiency. Retail and wholesale banking. Economies of scale in banking. Expansion and specialization of operations, the path towards universal banks. Performance measures of a banking institution and key determinants of their profitability. The effect of mergers and acquisitions on bank efficiency.

The Theory of the Banking Firm. The industrial organization approach to banking. The presentation of the perfect competition model, the Monti-Klein model of a monopoly bank, the oligopolistic competition model.

Principles of Bank Management. The application of a strategic management model in banking management. Asset-liability management, liquidity management, capital adequacy.

Bank Risks & Risk Management. Definitions of the risks faced by banks (credit risk, interest rate risk, currency risk, market risk, etc.). Management of interest rate sensitivity: capital exposure management, (Gap analysis), the concept of duration, duration exposure, curvature and senior duration and the hedging of interest rate risk using derivative products. The management of exchange risk with derivative products.

Bank Regulation. Credit analysis and the concept of securitization. Market risk and the value at risk approach (VaR analysis). Arguments for and against banking supervision. Regulatory capital. Basel Accord. Core and additional equity capital. Insurance coverage of deposits.

Modern Views about Monetary Policy. Aggregate Supply and Demand. Money and Inflation. The rational expectations revolution and neo-Keynesian and neo-classical views on the conduct of monetary policy. The theory of central banking, independence of the central bank, objectives, and possibilities of monetary policy. Discretionary monetary policy versus monetary policy with rules. Presentation of the Taylor rule in monetary policy.

<table>
<tr><th colspan="2">4. TEACHING AND LEARNING METHODS EVALUATION</th></tr>
<tr><td>TEACHING METHOD</td><td>Mixed</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Learning process support through the e-class online platform. Email usage, MSTEAMS.</td></tr>
<tr><td>ORGANISATION OF TEACHING</td><td>The lectures of the course take place in the halls of the Department of Economic Sciences. Informational material is distributed through the course page in the e-class, case studies are discussed, exercises are solved, and various videos are analyzed related to applications of theory in practice.

More specifically, the workload of the course is broken down as follows: (indicative):

<table>
<tr><th>Type</th><th>Description</th><th>WORKLOAD (HOURS)</th></tr>
<tr><td></td><td>Lectures</td><td>39</td></tr>
<tr><td></td><td>Study at home</td><td>80</td></tr>
<tr><td></td><td>Completion of assignments</td><td>50</td></tr>
<tr><td></td><td>Preparation for the final exam</td><td>39</td></tr>
<tr><td></td><td>Final Examination</td><td>2</td></tr>
<tr><td></td><td>Total</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>MODULE ASSESSMENT</td><td>Assignment 40%

Final Exams 60%</td></tr>
<tr><th colspan="2">5. RECOMMENDED BIBLIOGRAGHY</th></tr>
<tr><td>Suggested Bibliography:</td><td>- Siriopoulos C., Papadamou, S. (2014) Introduction to Economics of Banking and Capital Markets, Edition Utopia. In Greek.
- Casu B., Girardone C., Molyneux P., (2017 Introduction to Banking, 2nd Edition Tziola. In Greek.
- Jagdish Handa, (2002) Monetary Economics, Routledge: London.
- Matthews, K & Thompson (2014) The Economics of Banking, John Wiley and Sons.
- Mishkin F. S (2018) The Economics of Money, Banking and Financial Markets, (7th international edition), Addison-Wesley.</td></tr>
</table>

APPLIED ECONOMIC ANALYSIS

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**A**
MODULE TITLE	**APPLIED ECONOMIC ANALYSIS**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS**
LECTURES	3 HOURS	7

TYPE OF MODULE	COMPULSORY
PROREQUISITE MODULES:	NO
LANGUAGE OF TEACHING AND TESTING:	GREEK
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO
MODULE'S URL	https://eclass.uth.gr/courses/ECON_P_187/

2. LEARNING OUTCOMES

Learning Outcomes

Upon completion of the course, participants are expected to:

- understand sufficiently the basic economic concepts concerning the markets, the sectors of government's policy in the economy, and also fundamentals of the money markets and international transactions
- distinguish and apprehend the interdependence between internal and external factors of markets

General Competencies

The course aims to introduce in a critical way the basics of contemporary Economic Analysis. Emphasis is given on the fundamental problems of the operation of the markets on the micro and the macro level. The course demands little or no previous knowledge of economics.

The course focuses on the conceptual aspects of economic reasoning and not on the theoretical or mathematical demonstrations of economic theorems, in a way to make students able to understand the major aspects of the functioning of markets, their failures and remedies.

3.MODULE CONTENT

A) MICROECONOMIC THEORY: Demand and supply theory, Cost and production analysis, Forms of competition, Market Failures, Theory and Evolution of Firms, Transaction Costs Theory.
B) FUNDAMENTAL MACROECONOMIC INDICATORS- BALANCE OF TRADE AND CURRENT TRADE BALANCE
C) MONETARY THEORY AND POLICY

4. TEACHING AND LEARNING METHODS EVALUATION

TEACHING METHOD	Mixed
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The learning process is supported through the course's e-class online platform, the use of the official email of the department to communicate with students, and MSTEAMS
ORGANISATION OF TEACHING	The lectures of the course takes place in the amphitheaters of the Department of Economics. Informational and learning material is distributed through the e-class platform. More specifically, the workload of the module is analyzed as follows:

Type	Description	WORKLOAD (HOURS)
	Lectures	39
	Study at home	60
	Completion of assignments	40+2
	Preperation for the final exam	36
	Final Examination	3
	Total	180

MODULE ASSESSMENT	Two compulsory tests (40%), Participation (10%), final exam (50%)

5. RECOMMENDED BIBLIOGRAGHY

Suggested Bibliography:	○ Βαρουφάκης, Γ. (2007), Πολιτική Οικονομία, Αθήνα, Gutenberg. ○ Bowles S, R. Edwards, & F. Roosevelt, (2005), Κατανοώντας τον Καπιταλισμό, ελλ. μτφ Αθήνα, Gutenberg 2014, Επιμέλεια μτφ Μ. Ζουμπουλάκης.

	○ Krugman, P. & R. Robin (2014), Μακροοικονομική σε διδακτικές ενότητες, ελλ. μτφ Αθήνα, Gutenberg 2018. ○ Nicholson, W., (2005), Μικροοικονομική Θεωρία, ελλ. μτφ. Εκδ. Κριτική, 2008. ○ Mankiw, G., Taylor, M.P and Ashwin, A. (2012) Οικονομική των επιχειρήσεων, ελλ. μτφ. Εκδ. Κριτική, 2018

RESEARCH METHODOLOGY SEMINAR III

1.GENERAL			
SCHOOL	SCHOOL OF ECONOMICS AND BUSINESS		
DEPARTMENT	DEPARTMENT OF ECONOMICS		
LEVEL OF STUDIES	POSTGRADUATE LEVEL		
MODULE CODE		**SEMESTER OF STUDY**	**C**
MODULE TITLE	Research Methodology III		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**ECTS**
Lectures - Exercises – Practices- Use of EXCEL and R programming language		3 HOURS	7
TYPE OF MODULE	COMPULSORY		
PROREQUISITE MODULES:	NO		
LANGUAGE OF TEACHING AND TESTING:	GREEK		
THE MODULE IS OFFERED TO ERASMUS STUDENTS	NO		
MODULE'S URL	eclass.uth.gr		

2. LEARNING OUTCOMES
Learning Outcomes
The teaching of the course " Research Methodology III " aims to: • Familiarize students with the necessary knowledge and techniques that enable researchers of economic phenomena to quantify and estimate economic relationships governing the operation of

economic units and markets using statistical methods.

• Equip students with the necessary tools for verifying and evaluating econometric models and conducting forecasts.

• Introduce students to the analysis of time series data.

By the end of the course, students should be able to:

• Specialize and select an econometric model.

• Estimate a classic linear model.

• Test, examine, and evaluate an econometric model.

• Evaluate and address issues related to violations of the assumptions of a model.

• Design, estimate, and test time series models and perform forecasts.

• Apply the estimated models using the R programming language.

General Competencies

- Data and information search, analysis, and synthesis using the necessary technologies.
- Adaptation to new situations.
- Decision-making.
- Autonomous work.
- Teamwork.
- Work in an international environment.
- Work in an interdisciplinary environment.
- Project design and management.
- Generation of new research ideas.

3.MODULE CONTENT

1. Simple and multiple linear regression (OLS): Assumptions, sample estimation, hypothesis testing, significance tests for variables and linear constraints, simple and adjusted coefficient of determination, properties of estimators.
2. Violations of assumptions: Autocorrelation, heteroscedasticity, statistical tests (White, Durbin-Watson, Breusch-Godfrey), GLS and FGLS estimators, correlation of explanatory variables and error term, multicollinearity, misspecification.
3. Models of limited dependent variables.
4. Vector Autoregressive (VAR) models and causality tests.
5. Non-stationarity and unit root tests.
6. Cointegration and error correction models. Identification in standard and cointegrated systems.
7. Time-varying coefficient models.
8. Traditional panel data models.
9. Dynamic heterogenous panels.
10. Non-stationary panels.

4. TEACHING AND LEARNING METHODS EVALUATION

<table>
<tr><td>TEACHING METHOD</td><td>Hybrid</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Support for the learning process is provided through the use of:

(a) The e-class electronic platform, institutional email, and the online course on the MS-TEAMS platform.

(b) The R programming language.</td></tr>
<tr><td>ORGANISATION OF TEACHING</td><td>The course is delivered within the classrooms of the Department of Economic Sciences, utilizing Microsoft Office 365 tools (Word, Excel, PowerPoint) and the R programming language. Lecture slides and supporting materials for each session are already posted on the e-class electronic platform for students to access during the lecture. The existing technological equipment in the classrooms also allows the use of an electronic whiteboard via a WACOM device, which enables writing on presentations and texts with the ability to save enriched texts and presentations. Enriched texts containing comments on the lectures, as well as solutions to exercises and problems, are also uploaded to the e-class of the course after each lecture. Files containing additional exercises and problems for practice and understanding of the course material are provided for each topic. Solutions and comments for these problems are given either during the lectures or during specified office hours announced by the instructor (in special cases, even through email using students' institutional accounts).

More specifically, the workload of the module is analyzed as follows:

<table>
<tr><th>Type</th><th>Description</th><th>WORKLOAD (HOURS)</th></tr>
<tr><td></td><td>Lectures</td><td>39</td></tr>
<tr><td></td><td>Study at home</td><td>80</td></tr>
<tr><td></td><td>Completion of assignments</td><td>50</td></tr>
<tr><td></td><td>Preperation for the final exam</td><td>39</td></tr>
<tr><td></td><td>Final Examination</td><td>2</td></tr>
<tr><td></td><td>Total</td><td>210</td></tr>
</table>
</td></tr>
<tr><td>MODULE ASSESSMENT</td><td>EXAMINATION PERIOD A' SEMESTER

Individual/Group Assignment: 30%

Written Exam: 70%</td></tr>
</table>

	REPEAT EXAMINATION Written Exam: 100%
5. RECOMMENDED BIBLIOGRAGHY	
Suggested Bibliography:	- Greene, W. H. (2003). Econometric analysis. Pearson Education India. - Wooldridge, J. M. (2015). Introductory econometrics: A modern approach. Cengage learning. - Gujarati, D. N. (2022). Basic econometrics. Prentice Hall. - Stock, J. H., & Watson, M. W. (2015). Introduction to econometrics 3rd ed. - Baltagi, B. H., (2008). Econometric analysis of panel data (Vol. 4). Chichester: Wiley. - Wooldridge, J. M. (2010). Econometric analysis of cross section and panel data. MIT press.