



# STUDY GUIDE

## Economics and Sustainable Development program

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UNIVERSITY OF  
WESTERN MACEDONIA

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## **Dear students**

On behalf of the University of Western Macedonia and the study program ECONOMICS AND SUSTAINABLE DEVELOPMENT which I have the honor to be the Director, I would like to congratulate you on your admission to the University of Western Macedonia.

Allow me to welcome you and wish you a good and productive stay in Greece, in the region of Western Macedonia, and in Kastoria.

The globalization of the economy, the international requirements for sustainable economic growth of the economies, the necessity for international energy regulations, and the tendency for a "clean" energy investment activity, increase the need for specialized and qualified expertis in the field of economics for sustainable economic growth and development at both at the micro- and macro-level of economic activity.

The ECONOMICS AND SUSTAINABLE DEVELOPMENT study program aims to train high-level executives to contribute to the management of private and state organizations, to embark them on a path of economic development, which "ensures" the sustainability of the very same organizations and the world as a whole.

Upon completion of the ECONOMICS AND SUSTAINABLE DEVELOPMENT study program, graduates will be able to use all the necessary methods, tools, models, and practices which are appropriate for a sustainable environment.

Finally, allow me to assure you that I but as well as the rest of my colleagues and the other teaching and administrative staff will be available for any issue that may arise during your stay in Kastoria.

Kastoria, January 2023

Professor Nicholas Tsounis

Director of the Economics and Sustainable Development Program

## **THE UNIVERSITY OF WESTERN MACEDONIA**

The University of Western Macedonia was founded in 2003 and it is based in Kozani with campuses in the cities of Kastoria, Florina, Grevena and Ptolemaida. It incorporates 7 Faculties, 22 Undergraduate Studies Programs, and 23 Postgraduate Studies Programs. The latter are organized by individual departments or they are interdepartmental, and some of the them are cooperations with other national and international universities.

The University is a Legal Entity under Public Law with full self-governance. It is supervised and sponsored by the State through the Ministry of Education and Religious Affairs. In accordance with the institutional framework for Higher Education the Administration of the University is exercised by the Rector and the Senate. The governance structure of the University is the following:

### **Rector**

Professor Theodoros Theodoulidis

### **Vice-Rectors**

Professor Nicholas Sergiannidis

Professor Anna Spyrtou

Professor Stergios Maropoulos

Professor Georgios Iordannidis

### **The Senate of the University of West Macedonia**

The Senate is composed of:

1. The Rector,
2. The Deans of the 7 Faculties
3. The Chairs of the 22 Departments
4. Representatives of undergraduate, postgraduate, and doctoral students
5. A representatives of administrative and technical staff.

## **FACULTIES AND DEPARTMENTS OF THE UNIVERSITY**

### **Faculty of Engineering based in Kozani**

Department of Electrical and Computer Engineering

Department of Mechanical Engineering

Department of Chemical Engineering

Department of Mineral Resources Engineering

Department of Product and Systems Design Engineering

### **Faculty of Economic Sciences based in Kozani**

Department of Economics based in the Kastoria campus

Department of Management Science and Technology

Department of Regional and Cross-Border Studies

Department of International and European Economic Studies  
Department of Accounting and Finance  
Department of Business Administration in the Grevena campus  
Department of Statistics and Insurance Science in the Grevena campus

**Faculty of Fine Arts based in Florina**

Department of Fine and Applied Arts

**Faculty of Agricultural Sciences based in Florina**

Department of Agriculture

**Faculty of Social Sciences and Humanities based in Florina**

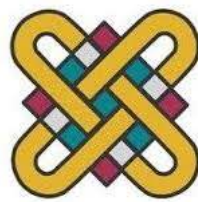
Pedagogical Department of Primary Education  
Department of Early Childhood Education  
Department of Communication and Digital Media in the Kastoria campus  
Department of Psychology

**Faculty of Health Sciences based in Ptolemaida**

Department of Occupational Therapy  
Department of Midwifery

**Faculty of Science based in Kastoria**

Department of Informatics  
Department of Mathematics



## Section A

# **The *Economics and Sustainable Development* study program**

## **A. ECONOMICS AND SUSTAINABLE DEVELOPMENT**

### **A1. The program**

The Undergraduate Studies Program entitled: "Economics and Sustainable Development" is an English program of the University of Western Macedonia (UoWM) located in the Kastoria Campus of the University and it is a partnership between three Departments: the Department of Economics of the Faculty of Economics, Chemical Engineering of the Faculty of Engineering, and Mathematics of the Faculty of Science. The responsibility for the organisation and the administration of the study program rest with the department of Economics.

The objective of the Program is the education, at the undergraduate level, of students from countries that are not members of the European Union (EU) in economics and especially in the areas of sustainable economic growth and development, circular economy, ecology and environmental economics with the use of environmentally friendly technologies. Its graduates will be able to meet the needs for sustainable economic growth and development solutions of their countries' economies on the one hand and the needs of the international market on the other.

The purpose of the program is to train executives to respond to the new requirements imposed by economic growth and development that fully take into account the needs of a burdened from economic activity environment, through:

1. The rapid integration of graduates into the labor market of their home country and the international labor market for a successful professional career, either in academia and research or in business.
2. The specialization of executives in using Financial Analysis methods and tools with an emphasis on sustainable economic growth and development.
3. The specialization of graduates in the international institutional framework of renewable energy sources and international energy trade.
4. the shaping of executives, with special abilities and skills, in the field of management of energy sources and the protection of the environment.
5. the provision of knowledge and skills to the program graduates for the organization and management of investments that create sustainable economic growth and development.

The education offered by the Program gives graduates professional career opportunities in both the public and private sectors of the economy and in various areas such as business administration, finance, banking, and financial advisory services. They can also be employed by research centers, regulatory authorities, public administration bodies as well as in secondary education.



## **A2. The Organizing Departments**

### **A2.1. Department of Economics**

The Department of Economics was founded in 2019. It is based in the city of Kastoria and is part of the Faculty of Economic Sciences of the University of Western Macedonia.

The Department's mission is the promotion of Economics with Academic and Applied teaching and research. It provides an exquisite level of economic teaching and offers two strands of specialization: a) Economic Analysis and b) Business Administration. Its graduates can pursue postgraduate and doctorate studies, both in Greek and International Universities.

Economic studies of a high level, combined with a modern curriculum, include disciplines that reflect the National Economy's needs as well as the needs of the local and global labor market. Therefore, promising direct links to the labor market are created for graduates.

The members of staff have significant theoretical and empirical knowledge in modern economic science and internationally recognized publications, which in return allows the transmission of knowledge to the students in the best possible way. Moreover, its administrative staff with its sound training supports the students to the completion of their studies.

The Department of Economics has developed strong research activities in the most profound and modern fields of Economic Science and has a significant contribution to the economic research activity of our country. It plays a central role in the production of economic knowledge, critical analysis of economic relations and institutions, as well as research projects which empower Greek and International literature with issues related to economic science.

As the only department of economic sciences in the Region of Western Macedonia, its research activity is closely related to the regional/local development process. In the context of this activity, the Department is closely cooperating with civil bodies, municipalities as well as businesses on a national, regional, and local level. It also explores issues of production, demand, innovation, development, growth, extroversion, institutions, trade, economic relations, services, and their respective strategies, which will lead to the improvement of their competitiveness and excellence.

### **A1.2. Department of Chemical Engineering**

The Department of Chemical Engineering was founded in 2019 and it has 11 faculty members, with a high level of modern scientific training, with an emphasis on deep knowledge of the science of Chemical Engineering and at the same time offering the ability to adapt and assimilate the constantly evolving technology. Also, the systematic laboratory training and practical training of the students sufficiently connect the theoretical training with the applications and allows getting acquainted with the environment in which they will be employed in their professional life.

The goal of the Department of Chemical Engineering of the University of Western Macedonia is to produce knowledge in the field of chemical engineering and to educate the student from the undergraduate to the advanced postgraduate level. The Department strives for excellence. It is

committed to the principles of meritocracy and consistency, within an academic framework of creative teaching and research, which aims to stimulate the scholarship and creativity of its students.

Next to the main objectives of the program, which are the thorough scientific formation of the new chemical engineer and the readiness to respond to the modern professional requirements of the sector, there is also the awareness of the social role of the engineer. In particular, for the chemical engineer, this translates into the promotion of environmental awareness and the development of a similar "green" culture in production that will drastically reduce inputs (natural resources, energy) and outputs (waste, etc.). This approach, which combines environmental protection and production, is not only a global priority dictated by climate change and the need to continuously reduce the ecological footprint, but also contributes to the improvement of the production process, the production of "green" products with a longer life cycle, as and the creation of new jobs

### A1.3. Department of Mathematics

The Department of Mathematics was established in 2019 and it is based in Kastoria as a part of the Faculty of Science.

The goal of the department's curriculum is to offer a modern course program covering the science of mathematics. The students of the department acquire the necessary scientific background to meet the needs of education and research.

As the only Department of Mathematics in the Region of Western Macedonia, its educational and research activity is also closely connected with the local community. As part of this action, the department works closely with the local branch of the Hellenic Mathematical Society, with the aim of the students' interaction with the mathematical community.

The curriculum lasts 8 semesters. Its goal is twofold. On the one hand, to properly train students who wish to teach Mathematics in Secondary Education, on the other hand, to properly train students who wish to continue their studies at the postgraduate/doctoral level and engage in research in the field of Mathematical Sciences, equipping them with the necessary knowledge and providing them with the appropriate undergraduate background.

The mission of the Department is to cultivate and promote Mathematical Science with academic and applied teaching, research, and research in a way that meets the demands of science and the real needs of the modern society.

The Department provides, its graduates, opportunities to access Master's Degrees as well as Doctoral Studies at Greek or international universities.

## **A2. Administrative bodies of the *Economics and Sustainable Development* Program**

The Economic and Sustainable Development program is governed by the following bodies:

1. The Senate, with the authority to provide final approval of the curriculum of the program and appoint the member of the Assembly of the Program and its Director.
2. The Assembly of the Program (AP). The AP is composed of seven members, with a term of office of four (4) years and is appointed by the Senate. Four of its members are appointed after the proposal of the Assembly of the Department of Economics, two of its members are appointed after the proposal of the Assembly of the Department of Chemical Engineering and one of its members is appointed after the proposal of the Assembly of the Department of Mathematics.
2. The Director of the Program. Is the Chair of the AP. By decision of the Senate, the Director of the program is appointed with a two-year term. Professor Nicholas Tsounis, serves presently as the Director of the Program, with a term of office until January 2025.

## **A3. Academic Staff**

The courses are taught by the member of staff of the Departments that organize the program. Invited professors from other Universities can also lecture on specialized issues, after the invitation of the AP. The following members of staff from the three co-organizing Departments will participate in the teaching activities of the program:

### **A3.1 Professors**

**Nicholas TSOUNIS, Professor, Department of Economics, *Director of the Program «Economics and Sustainable Development»***

Area of Expertise: «Economic Analysis»

Degree: Economics, Aristotelian University of Thessaloniki, Greece

M.A.(Econ), Ph.D., Economics, University of Manchester, UK

**Theodoros MANOVASSILIS, Professor, Department of Economic Sciences**

Area of Expertise: «Applied Mathematics»

Degree: Mathematics, University of Ioannina, Greece

Ph.D., Department of Science and Technology, University of Peloponnese, Greece

**Aspasia VLACHVEI, Professor Department of Economic Sciences**

Area of Expertise: «Marketing»

Degree: Agricultural Economics, Aristotelian University of Thessaloniki, Greece

Ph.D., Department of Agricultural Economics, Aristotelian University of Thessaloniki, Greece

**Konstantinos TSANAKTSIDIS, Professor, Department of Chemical Engineering**

Area of Expertise: «Dynamic and Modulating properties of bioorganic compounds in Anti-pollution Technologies»

Degree: Chemistry, University of Ioannina, Greece

Ph.D., Department of Chemistry, University of Ioannina, Greece

**Vaios KARAGIANNIS, Professor, Department of Chemical Engineering**

Area of Expertise: «Chemical technology and materials technology with emphasis on the utilization and oxidation of industrial solid and liquid waste»

Degree: Chemical Engineering, National Technical University of Athens, Greece

MSc D.E.A University Pierre et Marie Curie - Paris 6, Ecole Nationalite Superieure de Chimie de Paris, France

Ph.D., Department of Chemical Engineering, National Technical University of Athens, Greece

**Paraskevi MITLIAGKA, Professor, Department of Chemical Engineering**

Area of Expertise: «Chemistry- Biochemistry»

Degree: Chemistry, University of Ioannina, Greece

Ph.D., Department of Medicine, University of Ioannina, Greece

**Zacharoula KALOGIRATOU, Professor, Department of Mathematics**

Area of Expertise: «Numerical Analysis»

Degree: Department of Mathematics, National and Kapodistrian University of Athens, Greece

MSc Numerical Analysis & Computation, University of Manchester UK

Ph.D., Numerical Department of Mathematics, University of Manchester UK

### A3.2 Assisiate Professors

**Thomas SISKOU, Associate Professor, Department of Economics**

Area of Expertise: «Monetary Theory and Politics with Emphasis in Exchange Rate Systems for the European Transitions Countries»

Degree: Political Economy O Volkswirtschaftslehre, Johannes Gutenberg University, Germany

MSc, Design and Management of Private and Public Organizations, London School of Economics, UK

Ph.D., Economics, University of Macedonia, Greece

### A3.3 Assistant Professors

**Prodromos TSINASLANIDIS, Assistant Professor, Department of Economics**

Area of Expertise: «Applied Finance with emphasis on international capital markets»

Degree: Accounting & Finance, University of Western Macedonia, Greece

MSc, Accounting & Finance, University of Western Macedonia, Greece.

MSc, Statistic & Modelling, Aristotelian University of Thessaloniki, Greece.

Ph.D., Finance, University of Western Macedonia, Greece

Erasmus+ program co-ordinator

**Eirini Koronaki, Assistant Professor, Department of Economics**

Area of Expertise: «Business Administration with a focus on e-Business»

Degree: Business Administration, Athens University of Economics and Business, Greece

MSc, Marketing and Strategy, Warwick Business School, UK

Ph.D., Business Administration, Athens University of Economics and Business, Greece

**Stavroula Laspita, Assistant Professor, Department of Economics**

Area of Expertise: «Youth entrepreneurship»

Degree: Accounting & Finance, University of Western Macedonia, Greece

MSc, Business Administration, Radboud University Nijmegen, The Netherlands

PhD, Entrepreneurship, EBS Universität für Wirtschaft und Recht, Wiesbaden, Germany

**Antonis Tsitouras, Assistant Professor, Department of Economics**

Area of Expertise: «Economic Growth with emphasis on Dynamic Systems»

Degree: Economic Sciences, Aristotelian University of Thessaloniki, Greece  
MSc, "Management and Finance", University of South Wales, U.K.  
Ph.D., Economics, University of Western Macedonia, Greece

**Melina Dritsaki, Assistant Professor, Department of Economics**

Area of Expertise: «Applied Macroeconomic Models»  
Degree: Economics, Aristotelian University of Thessaloniki, Greece  
MSc, International Banking and Financial Studies, University of Southampton, UK  
Ph.D., Applied Economics, Department of Applied informatics, University of Macedonia, Greece

**Adam Stimoniaris, Assistant Professor, Department of Chemical Engineering**

Area of Expertise: «Hybrid polymer systems with carbon and ash nanofillers for anti-pollution technology applications»  
Degree: Chemist, University of Ioannina, Greece  
MSc, Chemical Technology, University of Ioannina, Greece  
Ph.D., Materials Science and Engineering, University of Ioannina, Greece

**Ioanna Vassiliadou, Assistant Professor, Department of Chemical Engineering**

Area of Expertise: «Physical Process Engineering»  
Degree: Department of Mechanical Engineering, University of Patras  
MSc Department of Environmental and Natural Resources Management, University of Patras  
Ph.D. Department of Environmental and Natural Resources Management, University of Patras

**Stylianos Garas, Assistant Professor, Department of Chemical Engineering**

Area of Expertise: «Advanced photolytic methods for the degradation of aromatic organic pollutants in the atmosphere»  
Degree: Chemist, University of Ioannina, Greece  
Ph.D., University of Ioannina, Greece

**Maria Antoniadou, Assistant Professor, Department of Chemical Engineering**

Area of Expertise: «Chemical Engineering»  
Degree: Chemical Engineering, University of Patras, Greece  
MSc, Chemical Engineering, University of Patras, Greece  
Ph.D., Chemical Engineering, University of Patras, Greece

**Georgios Vassiliadis, Assistant Professor, Departments of Mathematics**

Area of Expertise: «Stochastic Procedures»  
Degree: Department of Mathematics, Aristotelian University of Thessaloniki, Greece  
MSc, Statistics and Operational Research, Aristotelian University of Thessaloniki, Greece  
Ph.D., Department of Mathematics, Aristotelian University of Thessaloniki, Greece

**Georgios Psaradakis, Assistant Professor, Departments of Mathematics**

Area of Expertise: «Mathematical Analysis»  
Degree: Department of Mathematics, University of Patras, Greece  
MSc, Mathematics & Applied Mathematics, University of Crete, Greece  
Ph.D., Mathematics & Applied Mathematics, University of Crete, Greece

### A3.3 Lectures

**Vasileios Aggelopoulos, Lecturer, Department of Chemical Engineering**

Area of Expertise: «Air pollution of outdoor and indoor spaces and dissemination of information with modern technologies»

Degree: Department of Physics, University of Ioannina, Greece  
MSc, Chemical Environmental and Computational Technology – Simulation, University of Ioannina, Greece  
Ph.D., University of Ioannina, Greece

#### A4. Infrastructure - Facilities

The program is based on the Kastoria campus of the University of Western Macedonia and it will be hosted by the Institute of Economic Analysis and Entrepreneurship in the center of the city of Kastoria (Address: Karavangeli St., Kastoria). The infrastructures are modern with newly renovated building facilities that are fully equipped with all modern teaching aids and they are the following:

- Two classrooms with a capacity of 40 people each, fully equipped with computers, projectors and network connection.
- One Laboratory classroom with a capacity of 35 people, equipped with 35 PCs, projector, speakers and microphone, 1Gbps optical fiber connection to the internet. Programs used during the course include: Mathematica, Matlab, E-views, Wordpress, Lindo, Entersoft, SPSS, Gams, Canva, Miro.

Pictures of the above follow:



Additionally, the infrastructure of the Department of Economics which is also based in Kastoria (University Campus, Fourka Area, Kastoria) may also be used, according to the needs of the program. The infrastructures of the Department of Economics are modern with newly built building facilities that are fully equipped with all modern teaching aids. Its building facilities are part of the UoWM Campus, comprising 3 other Departments (Department of Informatics, Department of Mathematics and Department of Digital Media and Communication) with five buildings. The first two buildings are the Teaching and Administrative complex and the other buildings are the student canteen with an area of 200 m<sup>2</sup>, the restaurant with an area of 300 m<sup>2</sup> and a building housing some laboratories. The

first building (Teaching) houses the classrooms and laboratories. The second building (Administration) houses the departments' administrative services, the library with a reading room, the professors' offices and three auditoriums. All the spaces below provide comfortable access for people with mobility problems. In particular, the Department of Economics has the following infrastructure:

- Classrooms: The Department has a total of 6 Classrooms and, they are fully equipped with computers, projectors and network connection.
- Laboratory classrooms: The Department has a total of two teaching Laboratories. Each laboratory has a capacity of 21 people, equipped with 21 PCs, projector, speakers and microphone, 1Gbps optical fiber connection to the internet. Software used include Mathematica, Matlab, E-views, Wordpress, Lindo, Entersoft, SPSS, Gams, Canva, Miro, Stata.
- Secretariat Offices: The Department Secretariat is co-located in the Administration Building in an area of approximately 30 sq.m. and employs two permanent administrative employees. The Secretariat operates daily for the members staff and students from 9:00 to 15:00.
- Student Study Rooms and Reading Rooms: The Department of Economics uses, together with the other three departments based in Kastoria, the study and reading room with a total area of 100 sq.m. with approximately 70 seats housed and operating in the library, located on the University campus.
- Student Affairs Office: The student affairs office is located at administration building (2nd building) and operates on a daily basis from 8:00 - 15:00.
- Psychological Support Office: The psychological support office operates on a daily basis from 8:00-15:00.
- Restaurant of the Department of Economics: On the Kastoria campus, there is a restaurant that can serve simultaneously 300 students. The restaurant is open daily and serves breakfast, lunch, and dinner. Students are able to use the restaurant by paying a monthly subscription or by paying the preferential price of daily dining that applies to students and to University faculty members.
- Canteen of the Department of Economics: On the Kastoria Campus also operates a canteen with an area of 200 m<sup>2</sup> and a capacity of 80 people.
- Library network: The Department of Economic, participates in the Greek University library network and its supporting infrastructures.
- Digital services: The digital services provided by the IT Department and the Networks Department of the University consist of the following:
  - email / Webmail (<https://noc.uowm.gr/www/services/email/>)
  - Mailing Lists (<https://noc.uowm.gr/www/services/maillinglists/>)
  - Asynchronous Distance Learning (eClass) (<https://noc.uowm.gr/www/services/eclass/>)
  - Modern Distance Education, Zoom, BigBlueButton, Teleconferences (<http://noc.uowm.gr/www/services/webconf/>, ePresense, synergy, BigBlueButton)
  - Website Hosting (<http://noc.uowm.gr/www/services/webhosting/>)
  - Microsoft Office 365 (through DELOS 365) (<https://noc.uowm.gr/www/services/delos365/>)

- G Suite for Education (<https://noc.uowm.gr/www/services/gsuite/>)
- VPN service (<http://noc.uowm.gr/www/services/vpn/>)
- Personal Website (<http://noc.uowm.gr/www/services/homepages/>)
- Plagiarism Detection Service (turnitin) (<https://noc.uowm.gr/www/services/turnitin/>)
- Room Reservations (<https://noc.uowm.gr/www/services/mrbs/>)
- Collaboration Platform (<https://noc.uowm.gr/www/services/synergy/>)

#### **A5. Number of Students**

The number of admitted students per year is limited to a maximum of thirty-five (35) students per class. The minimum requirement for the operation of the program is the registration of ten students. The minimum number of students needed for the program to operate can be modified by the decision of the AC. The number of classes cannot exceed three (3).

#### **A6. Admissions Selection Criteria and Registration**

Eligible candidates are citizens of countries that are not members of the European Union, holders of a high school diploma or a corresponding to level 3 education certificate according to the International Standard Classification of Education (ISCED). The Assembly of Program may determine additional criteria regarding the student's ability to meet the cost of living in Kastoria throughout his/her studies. Students enrolled in the program are granted a certificate for their registration, which they must present to the Greek consular authorities of their country in order to obtain an entry and residence permit for studies (Schengen visa) with a duration of 4.5 years (includes 6 months of optional practical placement).

The candidate must submit the following documents/certificates:

1. Photocopy of passport
2. Document proving the address of the candidate's permanent residence
3. High school diploma or equivalent to level 3 education certificate according to the International Standard Classification of Education (ISCED)
4. The Assembly of the program may request, on a case-by-case basis, proof of the candidate's ability to cover the cost of his studies and stay in Kastoria. Also, it may request any additional supporting documents, that it deems necessary for the formulation of the judgment decision on the candidate's application.

#### **A7. Student Identification card**

Students receive an Academic ID after applying to the electronic system of the Greek Ministry of Education.



The Secretariat of the program keeps a separate file for each student, which contains: a) the titles and supporting documents presented during registration, b) photocopies of the certificates received, and c) any scholarships or awards received.

### **A8. Learning Outcomes**

The graduates are expected to develop the following:

#### **Knowledge**

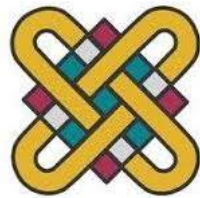
- They have a coherent and comprehensive body of knowledge on issues of Economic Analysis and Management of Entities both in their broad sense of an overall social/governmental existence and in their narrow sense of a Business Organization where elements and knowledge are contained both in the fields of Macroeconomic analysis, microeconomic analysis, economic development, monetary analysis, and public economics as well as in the fields of business administration, cost-benefit analysis, financial analysis, and marketing.
- Understand and apply quantitative methodologies that are closely related to the economic science, such as methodologies for the development of econometric models, time series analysis, statistical analysis, and investment evaluation.
- Analyze everyday economic problems and evaluate concrete economic policy proposals.
- Describe, compare, and critically reflect on theories, basic concepts, principles, and methodologies of the subjects taught in the undergraduate program.
- They have a coherent and integrated body of knowledge on issues related to the international institutional framework of renewable energy sources and in the field of energy sources management in relation to the protection of the environment.

#### **Skills**

- Collect, manage, analyze, and interpret critically and responsibly socio-economic data.
- Develop appropriate economic policy measures.
- Choose and correctly apply the appropriate financial tools for understanding, explaining, and dealing with contemporary economic phenomena and problems.
- Use specialized software packages for the application of econometric and other quantitative techniques.

#### **Abilities**

- Prepare and present papers in an effective way according to available time, space, and audience.
- Carry out tasks efficiently on an individual and team level.
- Have developed critical thinking on complex economic issues and problems.
- Demonstrate decision-making ability, responsibility, and autonomy.



## **Section B**

# **The Curriculum of the *Economics and Sustainable Development* program**

## **B. STUDYING IN THE *ECONOMICS AND SUSTAINABLE DEVELOPMENT* PROGRAM**

### **B1. Academic Title / Diploma**

The program awards a bachelor's degree (B.Sc.) in «Economics and Sustainable Development». The certificates are awarded by the Department of Economics of the University of Western Macedonia, with reference to the Departments that co-organize the program, in accordance with the institutional framework that is in force for Greek Higher Educations Institutions in Greece. For the award of the title, the student must complete the study requirements. Degrees and certificates in general are issued in the English language.

### **B2. Time Structure**

Undergraduate studies are based on the semester course system and in accordance with the curriculum of the program, reflected in the Study Guide, each academic year is divided into two semesters, Fall and Spring.

At the beginning of the semester, students fill out an electronic registration form with the selection of courses they wish to attend during the specific academic semester. The allowed number of courses is determined by the Assembly of the program. An examination is only done in a course that has been selected, according to the above, during the specific semester. Students, who have not made an electronic registration within the dates announced by the secretariat, do not have the right to be examined in any course for the given semester.

### **B3. Study Program**

The curriculum is designed taking into account the European Credit Transfer System (ECTS). According to the workload of each course ECTS are assigned (taking into account the hours of teaching, the hours of laboratory and other exercises, the expected workload of the students and the particular importance of the courses in the context of the Study Program). Each semester has 30 ECTS units, and for graduation the student must collect 240 ECTS.

Each semester has thirteen (13) full weeks of teaching. In case of missing weeks of teaching, it is possible to extend the duration of the semester with the approval of the Senate. Courses that do not take place due to reasons of faculty members' meetings or any other justified reason, must be replenished.

### **B4. Courses**

To obtain the degree, a successful examination in all the courses of the program is required. The teaching language of the courses is English.

Each semester has courses amounting to thirty (30) ECTS credits. A total of two hundred and forty (240) ECTS credits are required to receive the degree. Below the courses of the study program are

listed together with the Department that is responsible for their assignment (Economics: Econ, Chemical Engineering: ChemEng, Mathematics: Math).

$\alpha.\alpha$	TITLE OF THE COURSE	SEMESTER	ECTS	DEPARTMENT*
1	LINEAR ALGEBRA	1	7.5	Math
2	MACROECONOMIC ANALYSIS	1	7.5	Econ
3	STRATEGIC MANAGEMENT	1	7.5	Econ
4	ENERGY POLICY AND ENVIRONMENT	1	7.5	ChemEng
5	STATISTICS	2	7.5	Econ
6	DATA ANALYSIS	2	7.5	Econ
7	MICROECONOMIC ANALYSIS	2	7.5	Econ
8	ENVIRONMENTAL CHEMISTRY	2	7.5	ChemEng
9	MATHEMATICS FOR ECONOMIC ANALYSIS	3	7.5	Econ
10	STRATEGIC MARKETING AND COMMUNICATION FOR SUSTAINABILITY	3	7.5	Econ
11	FINANCIAL ECONOMICS	3	7.5	Econ
12	MATERIALS TECHNOLOGIES IN THE INDUSTRY	3	7.5	ChemEng
13	INTERNATIONAL ECONOMICS	4	7.5	Econ
14	ADVANCED MACROECONOMIC THEORY	4	7.5	Econ
15	ATMOSPHERIC ENVIRONMENT AND SUSTAINABLE DEVELOPMENT	4	7.5	ChemEng
16	FUNDAMENTALS OF ENTREPRENEURSHIP	4	7.5	Econ
17	BUSINESS STRATEGIES FOR SUSTAINABILITY	E	7.5	Econ
18	DYNAMIC MATHEMATICS	E	7.5	Math
19	ECONOMETRICS	E	7.5	Econ
20	CLIMATE CHANGE AND SUSTAINABLE	E	7.5	ChemEng

	DEVELOPMENT			
21	ENVIRONMENTAL ECONOMICS	ΣΤ	7.5	Econ
22	COMPUTATIONAL MATHEMATICS	ΣΤ	7.5	Math
23	INDUSTRIAL ORGANISATION	ΣΤ	7.5	Econ
24	RATIONAL MANAGEMENT OF NATURAL RESOURCES	ΣΤ	7.5	ChemEng
25	INTERNATIONAL MONETARY RELATIONS	Z	7.5	Econ
26	SUSTAINABLE SUPPLY CHAIN MANAGEMENT	Z	7.5	Econ
27	QUANTITATIVE METHODS IN BUSINESS	Z	7.5	Econ
28	ECOLOGY AND SUSTAINABLE DEVELOPMENT	Z	7.5	ChemEng
29	TIME SERIES ANALYSIS	H	7.5	Econ
30	ORGANISATIONAL BEHAVIOUR AND DEVELOPMENT	H	7.5	Econ
31	LABORATORY RESEARCH AND ECONOMIC DEVELOPMENT	H	7.5	ChemEng
32	BANKING AND FINANCE	H	7.5	Econ

**\* Economics: Econ, Chemical Engineering: ChemEng, Mathematics: Math**

Students may undertake a three-(3) month optional practical placement, with three (3) ECTS credits on the subject of their studies in any member country of the European Union. The supervisor of the practical placement is assigned by the Assembly and is the faculty member who teaches in the program.

### **B5. Teaching Procedure**

The teaching of the program's courses is carried out according to the timetable drawn up by the ECONOMICS AND SUSTAINABLE DEVELOPMENT's, Secretariat, under the responsibility of its Director, so that the flow of the educational process is as continuous as possible. The timetable includes the distribution of the teaching hours of the courses within the five working days of the week, the names of the professors and lecturers, and the classrooms and is announced by the Secretariat in good time.

The Assembly and the Director, bearing in mind the distribution of teaching workload to professors

and lecturers, may decide, depending on the type, of course, the form of teaching (lectures, seminars, tutorials, exercises, etc.), to divide the audience into individual classes. Likewise, they determine every other detail of the teaching process, respecting the constitutionally guaranteed by the Greek State, freedom of teaching and speech.

Responsible for the supervision of the program is its Director.

## **B6. Course Attendance**

The attendance of classes, tutorials, exercises, workshops, etc. by the students, is done in accordance with the timetable and the Study Guide of the program. To this end, students are entitled to use the laboratory facilities, libraries, reading rooms, and other equipment of the Departments that co-organize the program, in accordance with the decisions of the Assembly.

The attendance of seminars, workshops, and tutoring courses may be compulsory for students, by the decision of the course instructor or the Assembly.

In the courses, the course instructor can specify specific obligations of the students (type of research work, presence during the course, presentations).

Special care is taken to facilitate the attendance of courses by students with special needs and learning difficulties. In order for such special facilities to be provided, it is necessary for the students to submit a diagnostic report of learning difficulties to the Secretariat in a timely manner issued by a recognized public Medical Education Center or Station. After a written request from the interested party to the Secretariat of the Student Affairs Office, at the beginning of each semester, the teaching staff involved in the courses that the student has selected is informed about the learning difficulties he is facing and the most proper way of examining them in order to facilitate the educational process.

## **B7. Examinations - Tests**

The evaluation of the students is based on the final examination, written or oral, after the end of the semester. The examination method, with the exception of that of students with learning difficulties, should be the same for all students. An examination beyond the predetermined date, or in a way different from the predetermined one, is not allowed except at the request of the student due to serious health problems.

Special care is taken to examine students with learning disabilities. Following a written request from the interested party, the Assembly may determine the method of examination, if this is not clearly defined by the special diagnostic report submitted, which also certifies the learning difficulty faced by the student. If the special diagnostic report proves the student's inability to take part in written exams, he is exempted from all kinds of written exams and given the possibility of an oral exam. In this case, the examination takes place in the same material, in the same subjects, and with the same program as the students who are examined in writing. To facilitate students with learning disabilities, they sufficient time is given before the oral exam to study the exam topics, understand them and take

rough notes if they wish. These notes can be used during the oral examination. Under no circumstances will the rough notes be included in the final grade. For the participation of a student in a special examination, a written application is required from the interested party for each course.

There are three examination periods:

1. January, for the courses of the Fall semester,
2. June, for spring semester courses and
3. September (re-sit exams), for the courses of both semesters.

The duration of each examination period lasts for a maximum of four weeks.

The exam schedule for each semester is announced at least two weeks before the exam period. If for any reason, it is decided to extend the teaching of the semester, the examination period will be rescheduled. The schedule for the September period is announced in June.

Attendance at the final examination of each course after the end of the semester requires active participation in the educational activities that have been designated as mandatory by the course instructor and there is compatibility with the current legislation.

In addition to the grade resulting from the prescribed final exams, the course instructor may instruct additional midterm exams or tests which could be considered the final result of the grade of the course. These tests can be one or more of the following cases:

- Written and/or oral mid-term exams
- Written exercises in class
- Laboratory exercises
- Homework
- Active participation in working groups.

The final score, in addition to the score of the final exam, will also take into account the score of the other assessment methods with a degree of the weight determined by the course instructor.

In the first week of each semester, the course instructor posts on the Department's website or the e-Class platform the compulsory and optional educational activities and the evaluation process of the course as well as any other information related to the course.

The Assembly is responsible for the smooth conduct and supervision of the exams. During the examination, the course instructor of the course is present in the room. Invigilators may be members of staff, teaching assistants, technical staff, adjunct faculty, Ph.D. candidates, postgraduate students, scholarship holders, as well as administrative staff of the program. The behavior of the invigilators must not be offensive to the dignity of the examinees. For the written exams, each professor sets the minimum and maximum duration time. Each day of the examination period is divided into six two-hour periods starting at 9:00, 11:00, 13:00, 15:00, 17:00, and 19:00 and the start of the examination for each course must coincide with one of these hours.

## **B8. Regulations for the Examinations**

Students must show upon request proof of their student status. Otherwise, they are not allowed to participate in the exams. The required control at the beginning of the exam is the responsibility of the invigilators and the course instructor of course.

Cooperation, conversation, and any exchange of objects between the participants in the examination are prohibited.

It is forbidden to enter the rooms where the examination is held after it has started and during it. Examinees are obliged to comply with the invigilators' instructions regarding their arrangement in the room.

The use of any type of aid (books, notes, etc.) is prohibited, with the exception of those expressly permitted by the course instructor.

During the examination, the use of mobile phones is prohibited, they must be switched off. Cell phones are not allowed to be used as calculators. Any attempt to turn on or use a mobile phone during the exam is considered an attempt to cheat and will automatically nullify the exam sheet (by the invigilators).

The exam topics must be returned together with the student's answer sheets. Any reference sheet that might be given to the students during the exam is also returned. If the course instructor allows it, the students can take the topics with them and not hand them in.

It is forbidden for the examinee to leave the room during the examination. A brief exit may be allowed, only after the permission of the supervisor and due to extreme necessity.

During the exams, the technical staff may limit internet access through the wireless networks of the Departments.

Students accept the above rules by participating in the exams.

In cases of cheating or violation of the above rules, the invigilator informs the responsible course instructor who is then obliged to inform the Assembly accordingly. Then the Assembly, after an evaluation of the matter in which it can also request the presence of the student involved (or students involved), must, if it is proven that the rules of the exams have been violated, take the following actions:

- i. If it was the first time that there was a violation of the rules by the specific student, a ban is imposed on participation in the examination of the specific course until the corresponding examination period of the following academic year. If, e.g. a student is found to be cheating in a course during the September examination period, has the right to retake that course in the September examination period of the following year.
- ii. In case of copying or violation of the exam rules for a second time, the Assembly, apart from what is mentioned in (i), imposes a ban on the student from participating in the exams of all courses of the following academic semester.



## **B9. Grading**

The performance in the courses is evaluated with points given during the knowledge assessment process. Each course is independently graded with an accuracy of one decimal place. The grading scale for the student's overall performance is defined from zero to ten. Specifically, the grade scale is: "Excellent" from 8.5 to 10, "Very good" from 6.5 to 8.49, and "Good" from 5 to 6.49. The minimum passing grade is 5.0. Grades lower than 5.0 fail the exam and the student has to re-sit the course exam in the next exam period.

The results of the exams are registered electronically for each student by the course instructor within four weeks, at the most, of the exam of the course, and in any case in a reasonable time so as not to hinder the process of selecting courses by the students. Students are informed of the exam grade from their institutional account. Students cannot retake a course in which a passing grade already exists. In the case of two or more passing grades, the grade from the older examination period applies.

The student has the right to be informed by the course instructor about the method of grading, regardless of the type of examination.

A change of registered score is allowed, following a request from the course instructor to the secretariat of the program.

The student is obliged to repeat the courses in which he/she did not receive a passable grade and therefore to be examined according to the new conditions if there is any change (e.g. in the material).

If the student fails three or more times in a course, by decision of the Director, he/she is examined, following his application, by a three-member committee of member of staff of the program, who have the same or a related subject and are appointed by the Director. The course instructor is excluded from this committee.

## **B10. Study Duration**

Students must complete their studies in the program in up to six years (12 semesters). If, after the end of the 12th semester, the conditions for receiving the degree have not been fulfilled, the student is deleted from the program without any further obligation of the University of Western Macedonian towards him/her. In exceptional cases, the maximum duration of study can be extended for one more year (2 semesters) by the decision of the Assembly of the program, which must be ratified by the Assemblies of the three Departments that co-organize the program.

For those who have attended international education programs, as exchange students (with the Erasmus+ program), the time of the program, the credits, and the corresponding score, which is converted to the above-mentioned grading scale, are recognized as actual study time.

## **B11. Grade of the Academic Title**

The award of the degree certifies the successful completion of the studies and indicates a grade with

an accuracy of two decimal places. Grading is done in accordance with the above reference (article 9, paragraph 1).

The grade of the degree is calculated as a weighted average of the sum of products of course marks multiplied by the course ECTS credits and divided by the sum of ECTS credits. The minimum number of ECTS credits required to receive the degree is 240.

#### **B12. Graduation ceremony**

The students, who have successfully completed their studies, may participate in a graduation ceremony organized by the program in the presence of the Rector, or his deputy, and/or the Dean, and/or the Chairs of the Departments that co-organize the program and its Director. The participation in the ceremony is not compulsory for the award of the bachelor's degree and it has ceremonial purposes only. The certificate of completion of studies is signed by the Secretary of the program and is sealed with the seal of the expediting Department of Economics. The graduation ceremony takes place on dates set by the Director in consultation with the Chairs of the Departments that co-organize the program.

Each graduate receives a certificate of graduation, a certificate of analytical marks, and a diploma of the bachelor's degree.

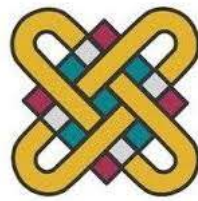
The diploma is signed by the Rector, the Director of the program, and the Secretary of the Department of Economics and sealed with the seal of the Department of Economics. By the decision of the Senate, a fee may be set for the corpus of the Diploma, the amount of which is determined by the Senate. The type of the diploma material is set by the Organization of the University of Western Macedonia.

#### **B17. Students' Advisor (Tutors)**

For each first-year student and no later than 30<sup>th</sup> November of each academic year, the Director of the program assigns an Academic Advisor who will be selected from the body of faculty members of the *ECONOMIC AND SUSTAINABLE DEVELOPMENT* (ESD) program. First-year students is equally distributed among the faculty members and the selection is done randomly. A student's Academic Advisor remains the same until the end of his/her study and advises and supports the student on issues and problems he/she may face during his/her study and stay in Kastoria.

#### **B18. Teaching Books and Aids**

The Assembly of the program approves the number and type of textbooks and aids for each course, which must be in the English language.



## Part C

**B.Sc. in *Economic and Sustainable Development***

**Description Courses**

## C1. THE COURSES BY SEMESTER

The distribution of the courses per semester along with the corresponding credits is as follows.

SEMESTER 1	ECTS	COURSE INSTRUCTOR
LINEAR ALGEBRA	7.5	GEORGIOS VASSILIADIS
MACROECONOMIC ANALYSIS	7.5	THOMAS SISKOU
STRATEGIC MANAGEMENT	7.5	IRINI KORONAKI
ENERGY POLICY AND ENVIRONMENT	7.5	KONSTANTINOS TSANAKTIDIS/STYLIANOS GARAS
<b>ECTS TOTAL</b>	30	
SEMESTER 2		
STATISTICS	7,5	THEODORE MONOVASSILIS
DATA ANALYSIS	7.5	MELINA DRITSAKI
MICROECONOMIC ANALYSIS	7.5	NICHOLAS TSOUNIS
ENVIRONMENTAL CHEMISTRY	7.5	ADAM STIMONIARIS
<b>ECTS TOTAL</b>	30	
SEMESTER 3		
MATHEMATICS FOR ECONOMIC ANALYSIS	7.5	THEODORE MONOVASSILIS
STRATEGIC MARKETING AND COMMUNICATION FOR SUSTAINABILITY	7.5	IRINI KORONAKI
FINANCIAL ECONOMICS	7.5	PRODROMOS TSINASLANIDIS
MATERIALS TECHNOLOGIES IN THE INDUSTRY	7.5	ADAM STIMONIARIS/VAIOS KARAGIANNIS
<b>ECTS TOTAL</b>	30	
SEMESTER 4		
INTERNATIONAL ECONOMICS	7.5	THOMAS SISKOU
ADVANCED MACROECONOMIC THEORY	7.5	ANTONIS TSITOURAS
ATMOSPHERIC ENVIRONMENT AND SUSTAINABLE DEVELOPMENT	7.5	VASSILIOS EVAGELOPOULOS
FUNDAMENTALS OF ENTREPRENEURSHIP	7.5	STAVROULA LASPITA
<b>ECTS TOTAL</b>	30	

<b>SEMESTER 5</b>		
BUSINESS STRATEGIES FOR SUSTAINABILITY	7.5	ASPASIA VLAHVEI
DYNAMIC MATHEMATICS	7.5	GEORGIOS PSARADAKIS
ECONOMETRICS	7.5	MELINA DRITSAKI
CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT	7.5	KONSTANTINOS TSANAKTIDIS
ECTS TOTAL	30	
<b>SEMESTER 6</b>	ECTS	
ENVIRONMENTAL ECONOMICS	7.5	ANTONIS TSITOURAS
COMPUTATIONAL MATHEMATICS	7.5	ZACHAROULA KALOGIRATOU
INTERNATIONAL MONETARY RELATION	7.5	THOMAS SISKOU
RATIONAL MANAGEMENT OF NATURAL RESOURCES	7.5	IOANNA VASSILIADOU
ECTS TOTAL	30	
<b>SEMESTER 7</b>	ECTS	
INDUSTRIAL ORGANISATION	7.5	NIKOLAOS TSOYNIS
SUSTAINABLE SUPPLY CHAIN MANAGEMENT	7.5	ASPASIA VLAHVEI
QUANTITATIVE METHODS IN BUSINESS	7.5	THEODORE MONOVASSILIS
ECOLOGY AND SUSTAINABLE DEVELOPMENT	7.5	ADAM STIMONIARIS
ECTS TOTAL	30	
<b>SEMESTER 8</b>	ECTS	
TIME SERIES ANALYSIS	7.5	MELINA DRITSAKI
ORGANISATIONAL BEHAVIOUR AND DEVELOPMENT	7.5	STAVROULA LASPITA
LABORATORY RESEARCH AND ECONOMIC DEVELOPMENT	7.5	PARASKEVI MITLIAGKA/MARIA ANTONIADOU
BANKING AND FINANCE	7.5	PRODROMOS TSINASLANIDIS
ECTS TOTAL	30	

## C2. Description of the Courses

### A' SEMESTER

#### Linear Algebra (Department of Mathematics)

##### Learning outcomes:

This is an essential introductory subject that offers the preliminary knowledge of mathematics for economics science students. The aim is to introduce and familiarize students with the basic aspects of linear algebra. On successful completion of this module the learner will be able to:

- Handle matrices (addition, multiplication, inversion, factorization).
- Solve linear systems, and linear systems of special forms (symmetric, positive definite, diagonal, banded)
- Compute eigenvalues and eigenvectors of a given matrix
- Solve all the above problems using MATLAB.

##### Course Contents:

- Matrices, special matrices, matrix operations.
- Systems of linear equations, Gaussian elimination, LU factorization, Inverse matrix.
- Vector spaces and subspaces, Linear combination, dependence, basis, and dimension.
- The Nullspace of A, the complete solution of  $Ax=b$ .
- Determinants, properties, and applications.
- Linear transformations.
- Eigenvalues and eigenvectors, matrix diagonalization.
- Introduction to MATLAB and applications to all above topics.

#### Macroeconomic Analysis (Department of Economic Sciences)

##### Learning outcomes:

Economics is the science that deals with the "material" side of our lives. Macroeconomics, -unlike microeconomics which deals with the economic decisions of individual agents- focuses its attention on the macro-level of economic activity or otherwise the interaction of economic variable within the economy as a whole. Its goal is to discover the rules governing the operation of the economic system of a entire country.

Aim: The aim of the course is to help the students to develop a basic understanding of macroeconomic issues and problems and to provide them with basic analytical tools to deal with such macroeconomic problems.

##### Upon successful completion of the course, the student will be able to:

- Understanding the fallacy of synthesis and learning to differentiate between the micro and macro level and analysis
- Understanding the economic cycles and macroeconomic identities
- Using methodologies and techniques to measure the economic activity of the whole economy
- Identifying the main macroeconomic sectors
- Identifying the main variable which influences the contribution of the activities of the

macroeconomic sectors/ variable and therefore the activity of the whole economy

**Course Contents:**

The course is divided into four parts.

The first Part: Defining and Identifying macroeconomic activities, includes

- The macroeconomic cycles (without the state, with the state, and the open cycle )
- The macroeconomic activities and the main macroeconomic sectors
- The Gross Domestic Product GDP
- Methods measuring the GDP
- Variations of GDP
- Other Macroeconomic Variables

The second part: The main macroeconomic theories, includes.

- Basic macroeconomic concepts: macroeconomic goals and macroeconomic policies (public and monetary policy)
  - o A simple classical macroeconomic model: From A. Smith to Keynes. A long-term analysis
  - o Says Law
  - o Loanable Funds Theory
  - o Production technology and the Labor Market
  - o Quantitative Theory of Money
- A neo-classical view of Keynes
  - o The theory of effective demand
  - o The theory of disposable funds
  - o Price and loan rigidities and the labor market

The third part: the neo-classical synthesis of Mr. Hicks, includes

- The IS curve
- The LM curve
- The IS-LM framework
- The AD-AS framework

The fourth part: Macroeconomic Policies, includes

- The Case of Fiscal Policies
- The Case of Monetary Policies
- The Phillips Curve

The synthesis of the different schools in the time: Short Run Intervention and Long Run Equilibrium

**Strategic Management (Department of Economic Sciences)**

**Learning outcomes:**

Course content includes a variety of theories and approaches in strategic management and aims at introducing students to the main strategic assessment, analysis, and strategic decision-making tools. During the course, students will have the opportunity to evaluate the key components of the key strategic management question, how and why some organizations perform better than others and suggest solutions for the long-term survival of each type of organization.

**Upon successful completion of the course, the student will be able to:**

- Develop analytical and critical thinking skills related to strategic management theory
- Demonstrate in-depth knowledge of different models of strategic management.
- Assess the mission, goals, and objectives of an organization.

- Identify and evaluate organizational resources and capabilities, core competencies, and dynamic capabilities.
- Identify and understand the key factors of an organization's success.
- Evaluate the different approaches to strategy making.
- Understand and evaluate the competitive forces in the market.
- Understand and evaluate stakeholders' roles and influence.
- Recognize different types of competitive advantage.
- Understand how value is created through strategic cost leadership and differentiation.
- Understand and evaluate the importance of creativity and innovation in strategic success.
- Understand and evaluate the importance of structure, design, organizational culture, and business environment in effective strategic business management.

**Course Contents:**

- Introduction to strategic management (definitions, levels of strategy, strategic management, strategic planning)
- The external environment (macro-environment, sectors, strategic groups, competitors)
- Internal environment (value chain, resources, capabilities & skills, VRIO analysis)
- The vision of the business
- Organizational culture and strategy
- Competitive Strategies - Theories of Creating Competitive Advantage.
- Corporate strategic direction
- Evaluation - Selection of strategic directions
- Implementation of Strategies - Balanced Targeting Table
- International strategy

### Energy Policy and Environment (Department of Chemical Engineering)

**Learning outcomes:**

- Presents the view of small communities and what they can offer to current developments in terms of energy as well as the perspective of rural bioenergy producers
- Opens the debate on the linkages between energy and the environment in specifically the Northern European context. However, some groups are attempting to incorporate concern for the environment with business and innovation.
- The environment covers so many different aspects of life from health and recreation to business and commerce that there are always competing interests involved in any legislation over the environment.
- Many individuals and organizations are involved as stakeholders in the process of making and implementing environmental policy

**Course Contents:**

- Energy policy may include legislation, international treaties, subsidies and incentives for investment, guidelines for energy conservation, taxation, and other public policy techniques.
- The United States had resisted endorsing the Kyoto Protocol, preferring to let the market drive CO<sub>2</sub> reductions to mitigate global warming, which will require CO<sub>2</sub> emission taxation.
- Aggressive energy policy reform, including the need for a reduction of CO<sub>2</sub> emissions with a cap and trade program, could help encourage more clean renewable, sustainable energy development.



- . The energy is used for transport, industry, and domestic use. The remaining portion comes primarily from hydroelectric and nuclear stations.
- Renewable energy in Europe.
- Cap-and-trade is a market-based approach used to control pollution by providing economic incentives for achieving reductions in the emissions of pollutants.
- Environmental policy is between environmental and business interests.

## B SEMESTER

### Statistics (Department of Economics)

#### Learning outcomes:

This is an introductory course to probabilities and statistics. Statistics is the study of the collection, organization, analysis, interpretation, and presentation of data. Statistical methods are useful in all aspects of real life as business, management, education, medicine, etc. There are two major parts to the course:

- Descriptive statistics. Collection, classification, description, and presentation of data.
- Probability theory.
- All methods studied in the course are implemented using MS EXCEL.
- After successful attendance of the course the students will be able to:
  - Collect, classify, and present a set of data
  - Address real-life probability problems
  - Know basic probability distributions

#### Course Contents:

- 1) Introduction – Basic concepts (population, sample – sampling designs, type of data).
- 2) Descriptive statistics (frequency tables, graphical representation of data, measures of central tendency, measures of variation, measures of symmetry, outliers).
- 3) Introduction to Probability theory (random experiment, event, sample space, classical definition of probability, basic counting principles, combinations, permutations), conditional probability.
- 4) Random variables, distribution functions, discrete random variables, continuous random variables, expectation, and variance. Bernoulli distribution, Binomial distribution, Geometric distribution, Poisson distribution, Normal distribution.

### Data Analysis (Department of Economics)

#### Learning outcomes:

On successful *completion of this module* students will be able to:

- Describe data analysis processes.
- Use data software packages in the implementation of data analysis techniques.
- Understand appropriate statistical measures for various types of data.

Critically evaluate and assess the results of data analysis approaches.

#### Course Contents:

Data analysis is the process of collecting, modeling, and analyzing data to extract insights that support decision-making. There are several methods and techniques to perform analysis depending on the industry and the aim of the analysis. The course aims to familiarize the students of the Department of Economics gaining a better understanding of different techniques for data analysis, and methods in quantitative research

Suggested Module Content:

- Introduction to Essential types of data analysis methods
  - Cluster analysis.
  - Cohort analysis
  - Factor analysis.
  - Big data analysis
  - Individual data analysis
- Introduction to major analysis techniques
  - Data cleaning
  - Data management
  - Data visualization
  - Data interpretation
  - Data analysis tools

Preparing an economic analysis plan

### Microeconomic Analysis (Department of Economics)

#### Learning outcomes:

Scope: The study and understanding of the behavior of the economic units in the market

Aim: For the achievement of the above scope the theory of the consumer and the firm will be presented together with welfare analysis, analysis of equilibrium, and analysis of the effects of competition and monopoly on profits and consumer welfare.

#### Course Contents:

Introduction - The economic problem. Consumer Theory: Consumer behavior, consumer equilibrium, Income and substitution effects – Slutsky's equation, consumer surplus, the demand curve. Theory of Production: Production functions, production in the short run, the iso-cost curves, profit maximization of the firm, returns to scale, economies of scale, and production in the long run. Cost theory: the nature of the cost, the cost curves in the short and long run and their relations, cost minimization, the expansion path of the firm, optimum point. Market Forms: perfect competition (equilibrium of the competitive firm, Pareto optimum, and social welfare ), monopoly (concept of monopoly power or market power, natural monopolies, barriers to entry, price discrimination, social welfare losses due to monopoly power ). Comparison of perfect competition and monopoly in terms of social welfare.

### Environmental Chemistry (Department of Chemical Engineering)

#### Learning outcomes:

This module aims to give the student a comprehensive introduction to water chemistry (chemical pollutants, water composition, chemical elements, etc.) It also aims to give a comprehensive

introduction to atmospheric chemistry, and photochemical reactions. Quality control of the atmosphere (nature of pollutants, effect of the pollutants on the flora and fauna). A basic introduction to the use of instruments and results evaluation of water parameters. Introduction to analytical techniques for estimation of air pollutants.

**Course Contents:**

- Introduction, nature, and water composition, Water chemical pollution
- Water chemical elements dissolve nitrogen -oxygen, CO<sub>2</sub>
- Water chemical elements, alkalinity, acidity, metal ions
- Cause of water pollution, ion fluorides oxygen demanding pollutants, pathogenic microorganisms
- Cause of water pollution, Fertilizers, Hydrocarbons, Suspended Solids, Heat
- Cause of water pollution Complex organic Συνθετικές οργανικές ενώσεις
- Cause of water pollution, Inorganic ενώσεις
- Cause of water pollution, Radioactive Materials
- Chemical and photochemical reactions
- reactions with atmospheric oxygen, reactions with atmospheric nitrogen
- Cause of air pollution, Carbon Monoxide, Nitrogen Oxides
- Hydrocarbons, Sulphur oxides, Material Suspended Particles

## C. SEMESTER

### Mathematics for Economic Analysis (Department of Economics)

**Learning outcomes:**

This is an essential introductory subject that offers to the students preliminary knowledge of calculus for economics science students. The aim is to develop basic skills and understanding of notions of differential calculus of one variable functions and function of several variables as well as their application in economic science. The focus is on those elements of a typical college calculus course that are most used in economics.

On successful completion of this module the learner will be able to:

- Use basic skills in the calculus of functions of one variable
- Use basic skills in the calculus of functions of several variables
- Use MATHEMATICA to address the above topics
- Understand, apply, and analyze calculus-based economic models

**Course Contents:**

Sequences and series. The principle of mathematical induction.

Functions: algebra of functions, inverse functions, polynomial and rational functions.

Limits. Continuity, differentiation functions, implicit differentiation, L'Hopital's rule, tangent.

Monotonicity, maximum and minimum values, concavity, symmetry, curve sketching.

Functions of several variables. Partial differentiation. Directional Derivatives. Total Differential.

Jacobian Matrix. Homogeneous Functions. Euler's theorem. Convexity, Implicit Functions Derivatives, Parametric Functions Derivatives, Tangential Plane.

Unconstrained optimization and optimization under equality constraints.

Applications to Economic theory:

- Rate of change, supply and demand curves, finding equilibrium.
- Present value, Annuity, Logarithmic derivative. Percent rate of change, Marginal cost-revenue-profit, elasticity.
- Consumer theory (Indifference Curves, Marginal Rate of Substitution, consumer surplus, utility maximization),
- Theory of production (Marginal and Average products, Marginal Rate of Technical Substitution, Production functions, Returns to scale),
- Cost theory (Revenue, cost, profit, profit maximization).

All the above topics are illustrated with MATHEMATICA.

### **Strategic Marketing and Communication for Sustainability (Department of Economics)**

#### **Learning outcomes:**

Course content includes a variety of theories and approaches in strategic marketing and communication for sustainability and aims at introducing students to the latest thinking and practice in strategic marketing and communications, with a particular twist on sustainability. During the course, students will have the opportunity to evaluate the key components of company marketing analysis and planning, creating and sustaining sustainable brands, consumer behavior theories, strategic communication, and stakeholder management.

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

- Critically appraise the role of marketing, marketing for sustainability, and especially communications (including digital marketing ones) in sustaining organizational success in a variety of global business environments.
- Identify and critically evaluate marketing information sources and interpret their impacts on strategic and operational marketing for strategic issues.
- Critically assess, and choose selectively from, the toolkit of concepts and analytical frameworks in order to formulate marketing strategies and implementation plans with an emphasis on strategic communications, CSR, and sustainability.
- Develop creative and sustainable marketing and digital marketing for solutions to sustainability challenges.
- Defend and justify proposals for marketing plans, which aim at further growth, transformation, and performance of firms.

#### **Course Contents:**

- Marketing for a Sustainable World
- Sustainability issues and actors
- Creating and sustaining sustainable brands
- How marketing communication works: behavioral foundations
- CSR and Responsible Management
- Strategic communication for sustainability
- Digital communication for sustainability
- Stakeholder management: collaborations and partnerships

## Financial Economics (Department of Economics)

### Learning outcomes:

The purpose of the course is to analyze principles, theories, models, and practices within the context of financial investment decision-making. The course initially presents the concept of the time value of money. Then it presents a set of practical methods to assess potential projects or investments in stocks and bonds.

Upon successful completion of the course, the student will:

- Be aware of the importance of the time value of money and how to calculate it.
- Learn to use the various investment valuation methods by recognizing their advantages and disadvantages
- Learn to value stocks and bonds

Critically evaluate, assess, and compare the performance of various investments in securities, or portfolios.

### Course Contents:

Will the lesson include the following sections:

#### 1st Time Value of Money:

Simple interest, compound interest, the future and the present value of money, interest rate adjustments, annuities, etc.

#### 2nd Capital Budgeting

Payback Period, Capital Return Method, Profitability Ratio, Present Value Method, Internal Rate of Return, Modified Internal Rate of Return.

#### 3rd Stocks and Modern Portfolio Theory

Valuation of Common Stocks, Risk, and return, Portfolio Theory, the Capital Asset Pricing Model (CAPM), Arbitrage Pricing Model

#### 4<sup>th</sup> Fixed income instruments

Bonds, Valuation of Bonds, Managing Bond Portfolios

## Materials Technologies in Industry ( Department of Chemical Engineering)

### Learning outcomes:

Introduction to Materials Science and Engineering, Atomic Structure and Bonding, Crystal and Amorphous Structure of Materials, Solidification and Crystalline Imperfections, Diffusion in Solids, Mechanical Properties of Metals, Phase Diagrams, Engineering Alloys, Polymeric Materials, Ceramics, Composite Materials, Corrosion, Electrical Properties of Materials, Optical Properties of Materials and Superconductivity, Magnetic Properties, Biological Materials, and Biomaterials

### Course Contents:

By the end of the course students will be able to:

- Name various materials and give applications of different materials types.
- Establish the importance of materials Science and Engineering in the selection of materials
- Describe the nature and structure of atoms as well as their electronic structure
- Describe primary and secondary bonds as well as mixed bonding
- Describe the effect of bond type on the mechanical and electrical properties of materials.
- Compute the density of metals with bcc and fcc cubic structures
- Describe X-ray diffraction and its use in the characterization of materials

- Draw directions and planes in cubic and hexagonal crystals
- Distinguish between single-crystal and polycrystalline materials and their corresponding effect on mechanical properties
- Clarify various types of crystalline imperfections and explain the role of defects in the electrical and mechanical properties of crystalline materials.
- Describe the techniques of SEM, TEM, HRTEM, AFM, and STM
- Describe rate processes in solids and the two main mechanism of diffusion as well as their industrial applications.
- Explain the effect of grain size and grain boundary on the plastic deformation and properties of a metal
- Describe the effect of nanograin size on the strength and ductility of metals
- Describe cooling curves and phase diagrams- ternary phase diagrams
- Reconstruct the iron-carbon phase diagram with appropriate phases, reactions, and microstructures
- Describe the advantages and disadvantages of alloys
- Define and classify ceramic materials as well as ceramic coatings and applications
- Define and classify polymers, thermosets, thermoplastics, and elastomers
- Define composite materials, major components, and corresponding applications
- Define corrosion and the respective electrochemical reactions
- Define conductivity, semi conductivity, and insulative properties in different material classes.
- Explain the phenomena associated with light radiation as it passes from one medium into another.
- Describe the two sources for magnetic moments in materials
- Define and classify biological materials and biomaterials
- Understand the principles of tissue engineering

## D. SEMESTER

### International Financial Economics (Department of Economics)

#### Learning outcomes:

The Scope: Financial assets are securities that embody claims against other financial assets or other real assets, and have an issuer and an owner. Their "form", "appearance", "duration" and generally "physical" nature is not given but depend on the ingenuity of the issuers and owners. As securities or contracts, they offer great flexibility because they can be used in many different ways, but they are also associated with risks as they are exposed to non-fulfillment of the contract. Their importance has increased in recent decades at a global level with the progress of technology. Especially with the advent of so-called derivatives the business world realized that such products can be used in manifold operations: speculation, hedging, and arbitrage

The Aim: The course aims to introduce students to the world of the so-called derivative market, the financial products which are based on other financial products, their usefulness in the business, and the risk they incorporate.

**On successful completion of this module students will:**

- Learn the three main categories of derivatives that are used in an international context and especially
- The forward and futures contracts are general and specific on currencies and interest rates
- The Option is general and specific on currencies and interest rates
- Swaps contracts
- Learn how to use them in
- Speculative way
- Hedging and Arbitrage

**Course Contents:**

The course is divided into the following parts:

The first part: Introduction of the International Financial and Capital Market, introduces the main international markets and especially the

- The interbank currency and interest rate market
- The trade of currencies and interest rates in the main international exchange markets

The second part: Introduction of the main derivative contracts

- The forward and future contracts with an emphasis on currencies and interest rate contracts
- The option contracts with an emphasis on currencies and interest rate contracts
- Swap contracts

The third part: Evaluation of derivatives

- Evaluation of forwards and futures contracts (cost of carry and arbitrage techniques )
- Evaluation of option by using the binomial model and Black Scholes formula
- Evaluation of swaps

### Advanced Macroeconomic Theory (Department of Economics)

**Learning outcomes:**

Scope: The study and understanding of the functioning of an open economy. Examines the functioning of the open economy and the effectiveness of fiscal and monetary policy under different exchange rate regimes

Aim: Students are given the tools of analytical techniques they will need to function effectively as active participants in the ever-changing world we live in.

The main objective of the course is to understand Fiscal and Monetary Policy in the open economy, the balance of payments mechanism, the functioning of the foreign exchange market, and the determination of the exchange rate.

**Course Contents:**

- Fiscal and Monetary Policy
- The Balance of Payments
- Foreign exchange market and exchange rate determination

- Balance and Economic Policy in a Small Open Economy
- Mundell-Fleming model with immediate adjustment of domestic interest rates to international (BP parallel to income axis)
- The Mundell-Fleming model of lagging domestic interest rates internationally (BP with positive slope)
- Employment and Unemployment
- Inflation and Unemployment
- Business circles
- Economic Growth

### **Atmospheric Environment and Sustainable Development (Department of Chemical Engineering)**

#### **Learning outcomes:**

The aim of the course is to provide a scientific understanding of the consequences of natural and human-induced perturbations on the earth's atmosphere in the framework of sustainable development. To achieve this, a good understanding of the mechanisms responsible for air pollution and climate change needs to be achieved.

After teaching this lesson, the students will be able to understand that air pollution and climate change take their toll on the economy and sustainable development by causing serious adverse impacts on the quality of life, human health, the environment, and the economy, while climate change affects the environment, economic stability as well as humans' wellbeing. In addition, air pollution and climate change plans and policies need to be integrated into national and international sustainable development strategies.

#### **Course Contents:**

Introduction to meteorology, fundamentals of the chemical composition of the atmosphere and its chemical reactions, atmospheric chemistry, pollutants emissions in the atmosphere, atmospheric greenhouse gases, air quality and its impacts on health and the environment, climate change, impacts of climate change on the natural environment, climate change adaptation and mitigation.

### **Fundamentals of Entrepreneurship (Department of Economics)**

#### **Learning outcomes:**

The course is based on the fact that in the modern economic environment, entrepreneurship and innovation have multiple dynamic effects on the creation of value by individuals, companies, organizations, and national economies. Entrepreneurship is a multifaceted phenomenon that includes many disciplines like strategy, finance, psychology, marketing, etc. It usually has to do with dealing with situations and problems that one does not expect in an evolving environment. The course aims to introduce students to the notions of entrepreneurship, innovation, and business planning to help them at setting up and develop their own companies and act entrepreneurially in any setting.

By the end of the course, students should:

- have understood the issues of innovation and entrepreneurship and in particular the design of business ventures based on the exploitation of knowledge and technology.
- work both individually and in groups



- evaluate technical, financial, and operational data to support and make decisions and organize their implementation.

#### **Course Contents:**

- Introduction to entrepreneurship and the entrepreneurial mentality
- Introduction to the entrepreneur and the founding team
- Different forms of entrepreneurship and their importance
- Business idea, opportunities, and their evaluation and design thinking
- Lean start-up method
- Business model and the business model canvas
- Entrepreneurial finance
- Innovation types and innovation ecosystems
- Business planning
- Presentation of the business plan

## **E. SEMESTER**

### **Business Strategies for Sustainability (Department of Economics)**

#### **Learning outcomes:**

This course explores the drivers, strategies, and business cases of companies that are taking a fully integrated approach to delivering sustainable business success in a rapidly changing world. The sheer scale of the challenge, along with the nature of emerging business opportunities, means that leading players are now adopting more transformative models – integrating sustainability principles into the heart of everything they do for long-term, sustainable business success. Furthermore, a new generation of start-up enterprises is being established for the specific purpose of meeting the great challenges of our time; they are building new, more sustainable business models that are disrupting markets for good (e.g. circular economy). The course incorporates real-life examples of social and environmental leadership to demonstrate the efficacy of good sustainable business decisions and illustrates the negative ramifications of outdated, purely economic-driven managerial decision-making. Influential concepts based on interdisciplinary research in sustainability are discussed in detail, and practical insights address how to turn policy into practice in the workplace.

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

- Increase their understanding of key strategic themes for future success through sustainability
- Rethink the value chain and build a clear vision for economic success and competitive advantage through sustainability
- Understand the environmental, social, and economic drivers and risks impacting companies – along with the major business opportunities for integrating sustainability factors within the core business strategy.
- Understand the latest big-impact topics, including how businesses can meet the Circular Economy challenge.

Develop insights on sustainable business analysis and strategy formulation.

**Course Contents:**

- Introduction to Sustainable Business and Sustainable Business Core Concepts and Frameworks
- Government, Public Policy, and Sustainable Business
- Framework for understanding business engagement in sustainability
- Transitional and transformational strategies and ecocentric dynamic capabilities
- Digital Disruption and Sustainable Innovative Business Models
- Leadership and Change Management in a Complex World
- Sustainability in Practice
- Sustainability Analytics and Reporting

### Dynamic Mathematics (Department of Mathematics)

**Learning outcomes:**

The main purpose of this course is to introduce students to the basic notions of dynamic mathematics and their interface with the economy. Specifically, certain topics will be developed from the theory of differential equations and difference equations. The course also includes exercises with MATHEMATICA to familiarize students with this computer tool.

On successful completion of this module the learner will be able to:

- Understand and solve differential equations,
- Understand and solve difference equations,
- Understand, apply, and analyze dynamical economic models,

Use computer software MATHEMATICA.

**Course Contents:**

- Introduction to Dynamical Mathematics and Economy. The notion of Differential Equation (DE). DE of Separable Variables – Homogeneous DE. – Exact DE.
- Linear DE of first Order – Bernoulli.
- Second-order linear differential equations with constant coefficients, homogeneous, nonhomogeneous, variation of parameters, judicious guessing.
- Linear differential equations with constant coefficients of higher order.
- Systems of linear differential equations. Phase Diagrams, a first approach.
- Introduction to Difference Equations- Solving Linear Difference Equations.
- Economical Applications: The dynamic supply-demand model, Samuelson Model. Samuelson Hicks Model.
- All the above topics are illustrated with MATHEMATICA.

### Econometrics (Department of Economics)

**Learning outcomes:**

On successful completion of this module students will be able to:

- Design and estimate a model of linear regression.
- Use an econometric software package (e.g. E-views) in the implementation of econometric techniques.
- Critically evaluate and assess econometric models and their results.

Critically evaluate and assess the results of diagnostic tests.

**Course Contents:**

Econometrics is based on the science of Economics, Statistics, and Mathematics. Its scope is the measurement and empirical testing of economic relations. The course aims to familiarize the students of the Department of Economics with using econometric techniques to estimate economic models using a computer and special for this purpose software packages (eg E-Views).

Suggested Module Content:

- Introduction to Econometrics
- Single-Equation Regression Models
  - Two-variable regression model: Basic concepts, model estimation, Ordinary Least Squares Method (OLS), Coefficient of Determination.
  - Classical Normal Linear Regression Model (CNLRM)
  - Two-variable regression model: Interval estimation and hypothesis testing.
  - Extensions of the two-variable linear regression model
  - Multiple Regression Analysis: The problem of estimation; The problem of Inference
  - Dummy Variable Regression Models
- Relaxing the assumptions of the classical model and diagnostic tests of residuals.
  - The normality assumption of residuals
  - Multicollinearity
  - Heteroskedasticity
  - Autocorrelation

### Climate Change and Sustainable Development (Department of Chemical Engineering)

**Learning outcomes:**

Climate change is one of the main long-term drivers of economic, social, and environmental change. It affects the overall structure of a city, and it depends even on the geography, the size of the intensity of the exhibition but also its degree sensitivity of to socio-economic and ecological systems, as well as the capacity of populations to adapt to such changes. In recent years, this phenomenon has taken a different turn and a different dimension. The rapid increase and intensity of natural phenomena observed in recent years, with As a result, the phenomenon of climate change is now often a threat to ecosystems and their local communities. In essence, climate change intervenes directly and can strongly interact between others and existing cultural systems, thus defining in practice even the same the future of the human species

**Course Contents:**

- Principles of Sustainable Development
- The road to zero carbon emissions
- Low technology carbon emissions and economic progress.
- Investments with ESG criteria ((Environmental, Social, and Corporate Governance criteria)
- Product production and supply services with a positive environmental impact.
- Production processes, with emphasis on recycling, saving natural resources, and the proper management of the generated waste.
- Forest protection and biodiversity

### F. SEMESTER

## Environmental Economics (Department of Economics)

### Learning outcomes:

The aim of the course is to understand the economic importance of the problem of environmental degradation and destruction. To this end, the impacts of the behavior of economic entities on the environment are being investigated while charting and investigating the economic ways of reducing pollution and protecting the environment based on the classic microeconomic framework.

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

- Recognizes the economic dimension of environmental problems.
- Distinguishes the main types of pollution and their impact on the economic environment
- Explores the importance of negative external economies and their impact on economic growth.
- Proposes financial solutions to reduce environmental problems.
- Explains that solutions to environmental problems are not unique, but depend on the nature of the problems and the phase of the economic cycle in which the economy is located.
- Assesses economic environmental policies and their contribution to sustainable development

### Course Contents:

The course includes the following parts:

Part 1: Introduction to the Economics of Natural Resources and the Environment,

Part 2: Market Failure and External Economies,

Part 3: Economic Theory for Environmental Management and Protection

Part 4: Introduction to the concept of Sustainable Development.

## Computational Mathematics (Department of Mathematics)

### Learning outcomes:

The aim of this course is to introduce students to computational mathematics. This includes numerical methods for the solution of linear and nonlinear systems, basic data fitting problems, and ordinary differential equations.

### On successful completion of this module, the learner will:

- be able to appreciate the role of computers in mathematics and economic science as a complement to analytical and experimental approaches.
- have the knowledge of numerical approximation techniques, know how, why, and when these techniques can be expected to work
- be able to program simple numerical algorithms in MATLAB and MATHEMATICA
- be able to use and evaluate alternative numerical methods, and communicate the results of numerical computation, with adequate explanations, in written and graphical form

### Course Contents:

- Locating Roots of Equations, bisection method, Newton's method, secant method.
- Introduction to the solution of systems of nonlinear equations - Newton's method for systems.
- Solving Systems of Linear Equations: Direct methods, Gaussian elimination, LU factorization Iterative methods Jacobi, Gauss-Seidel, SOR.
- Polynomial interpolation

- Numerical Integration Newton-Cotes methods, adaptive quadrature.
- Numerical differentiation.
- Numerical Integration of ordinary differential equations with Runge-Kutta methods and multistep methods.
- Programming in MATLAB, implementation of all above methods.

### International Monetary Relations (Department of Economics)

#### **Learning outcomes:**

International monetary relations are defined through three basic characteristics: the existence and use of many currencies, the movement of capital between countries, and the exercise of autonomous policies by individual countries to fulfill their own goals.

States have the possibility of choosing several exchange regimes and their choice depends both on the degree of capital circulation and on the type of policy that the states themselves aim to implement and also on the type of mix that other states will implement and mainly states with a large degree of influence on economic development.

Independent states choose - their own special currencies for reasons of national sovereignty and national identity but for reasons of expediency - the degree of movement of funds to and from foreign countries - the way of exercising their policies and in particular their monetary policies and their own goals

The successful operation and sustainability of an economy are dependent on the type of mix that the country itself wants to implement but also on the mix that other countries apply and the commitments and degrees of freedom imposed by the international monetary environment.

#### **Upon successful completion of the course, the student:**

- will get to know the balance of payments and the various sub-balances and especially the trade balance, the balance of capital movements, and the balance of foreign exchange reserves and how these affect the domestic economy
- will get to know the two extreme regimes: free fluctuation and fixed links and will get to know how they affect and are affected by the free movement of capital and the exercise of monetary policy
- will get to know the intermediate regimes and how these have been implemented at times in combination with the free movement of capital and autonomous policies
- will be able to evaluate combinations of exchange rate regimes with the degree of capital movement and the exercise of monetary policy and assess their likelihood and potential for success

#### **Course Contents:**

The course consists of the following parts

##### **1st: Introduction to international economics and includes**

- The Balance of Payments
- Exchange rates and basic exchange regimes
- Impact of exchange rate regimes on the balance of payments and in particular the trade balance and the balance of capital movements

**2nd: Historical Review of exchange regimes and includes**

- The system of Gold Standard
- The Bretton Woods system
- The system of freely floating exchange rates

**3rd: International Macroeconomic theory: Global Monetarism**

- Arbitrage
- Interest Rate Parity
- Purchasing Power Parity
- Fisher Rule

**4th: Consumption, Income, and Trade Balance: Mundell-Fleming Models**

- The IS-LM-EE methodology
- Monetary policy
- Fiscal Policy

**5th: The Trilemma in the time and the theories of exchange rate regime selection**

- The Incompatibility Triangle (Choice Trilemma) in time
- The first-generation trilemma
- The second generation incompatibility triangle: De La Tor, Levy-Yeyaty, and Schukler incompatibility triangle
- The Third Generation Trilemma, Financial Stability: Triangle Schoenmaker, Pisany – Ferry
- Theory of Optimal Currency Areas – The Trilemma as a function of institutional and economic integration

**6th: Economic and Monetary Union: An "ambitious functional triangle".****7th: Exchange rate crisis**

- First-generation crisis models
- Second-generation crisis models
- Third-generation crisis models
- The international financial crisis of 2007-08

**Rational Management of Natural Resources (Department of Economics)****Learning outcomes:**

By the term "natural resources" according to various interpretations given, we mean: Characteristics of the natural environment able to meet human needs. Goods or materials provided by nature. The primary and non-human transformed components of nature can be used to cover basic human goods. The primary basic and non-man-made goods. It is now well known that the development of a country depends to a large extent on the scientifically correct and planned exploitation and utilization of its natural resources. By exploitation and exploitation, we mean the cultivation and exploitation of the land, the development, and exploitation of forests, the extraction and exploitation of ores, the exploitation of the fishery wealth of the seas, the utilization of pastures for the production of productive animals, the pumping and exploitation of liquid fuels, the utilization of natural beauty, the exploitation of the water potential of our planet, the utilization of all kinds of forms of energy, etc.

**Course Contents:**

The management of a natural resource or an ecosystem consists of a number of NATURAL RESOURCES MANAGEMENT actions that lead to the realization of the objective goals or objectives. The overall management process is divided into four functions: Design Organization Address Control

The essential elements of rational nature management are:

- optimal ways of consuming types of resources and their complex use.
- taking into account the speed and volume of resource renewal;

- management of simple and extensive resource reproduction.
- maintaining the quality of the used landscape (ecosystem).
- exclusion and elimination of the negative consequences of the seizure of natural resources.
- organization of the most economical and profitable industries, taking into account the physical operation and dynamics of ecosystems.

## G SEMESTER

### Industrial Organization (Department of Economics)

#### Learning outcomes:

Scope: The study and understanding of strategic behavior of firms in oligopoly status and monopolistic competition.

Aim: Industrial organization aims to familiarize the students of the Department of Economics with the strategic behavior of firms in oligopoly status and monopolistic competition and micro-economic policy, the principles of regulatory policy, and competition policy.

#### Course Contents:

Market forms: oligopoly and monopolistic competition: Strategic behavior. Introduction to game theory - the decision analysis in strategic situations. Decision trees and game trees. Games in strategic and extensive form. Major strategies and the prisoner's dilemma. Nash equilibrium. Mixed strategies. Multiplicity and effective balances. Credible threats and balances are perfect in the sub-game. Repeated games. Games with incomplete ( asymmetric ) information. Reputation and strategic behavior. Pricing in oligopoly with homogeneous products - Cournot - Nash and Bertrand – Nash models. Solutions to the Bertrand paradox. The von Stackelberg ( leader - following undertakings ) oligopoly with differentiated products model - Hotelling and Chamberlin type models. Monopolistic Competition. Markets and Pricing inputs: Maximizing profit and demand inputs. Comparative statics. Marginal productivity analysis and identification of units involved. Monopsony. Monopoly power in the supply rates. Labor. Capital and return on capital. Demand for capital by firms. Optimal allocation of resources over time. Market failures: Basic causes of market failure, monopoly power. Externalities and allocative inefficiency, Solutions to the problem of externalities, public goods - characteristics and resource allocation with public goods, incomplete ( asymmetric ) information - moral hazard and adverse selection, Micro - Economic Policy, regulatory principles, and competition policy.

### Sustainable Supply Chain Management (Department of Economics)

#### Learning outcomes:

This course introduces students to the concept of sustainable supply chain management (SSCM). Sustainable supply chain management involves integrating environmentally and financially viable practices into the complete supply chain lifecycle, from product design and development to material selection, (including raw material extraction or agricultural production), manufacturing, packaging, distributing, storing, warehousing as well as usage, recycling and lastly disposal. This module develops an understanding of the complex nature of sustainability and explores current as well as future trends within sustainable supply chain management. The core premise of this module is that businesses are

subjected to increasing pressures to demonstrate their social and environmental credentials by operating a sustainable supply chain. This highlights a key criterion of a responsible company

**Upon successful completion of the course, the student will be able to:**

- Understand the complex term of sustainability and its application to the supply chain from multiple dimensions
- Demonstrate an awareness of environmental, social, and ethical aspects of Supply Chain Management
- Show a critical understanding of how sustainability links with efficiency and competitive advantage, influencing practices, business models, and strategies implemented
- Plan for and justify the application of sustainability factors when making operations and supply chain decisions

**Course Contents:**

- Understanding the complex nature of sustainability
- Sustainability and future trends
- Industry 4.0 And innovations aiding supply chain sustainability
- Sustainable sourcing
- Sustainable stages of the supply chain management
- Sustainable operations and supply chain management as competitiveness factors
- Measuring environmental impacts on supply chains
- Reverse logistics and closed-loop supply chain
- Business models and strategy in sustainable supply chains and stakeholders
- Business implications of sustainability practices in supply chains
- The social dimension of sustainable supply chains
- Operational aspects of efficiency in a sustainable supply chain

## Quantitative Methods in Business (Department of Economics)

**Learning outcomes:**

The course introduces the statistical theory and methods to prepare students for the remainder of the econometrics sequence. The emphasis of the course is to understand the basic principles of statistical theory. All methods studied in the course are implemented using SPSS.

After successful attendance of the course, the students will be able to:

- Use methods for parameter estimation.
- Compute confidence intervals.
- Perform hypothesis testing.
- Use linear regression.

**Course Contents:**

- 1) Random samples and asymptotic methods (laws of large numbers and central limit theorem)
- 2) Point estimation.
- 3) Evaluation of estimators (Unbiasedness, sufficiency, consistency, and the Cramer-Rao theorem).
- 4) Methods of Moments, Maximum Likelihood.
- 5) Interval estimation.
- 6) Hypothesis tests.



## 7) Linear regression analysis (regression in economics, best linear predictor)

### Ecology and Sustainable Development (Department of Chemical Engineering)

#### Learning outcomes:

The irruption of ecology in the last part of the twentieth century is a major shift in scientific paradigms, particularly in how humans view, understand, and interact with nature. Sustainable development refers to the economic development that is planned and implemented taking into account the protection of the environment and sustainability. Sustainability is guided by the maximum possible acquisition of goods from the environment, but without interrupting the natural production of these products in sufficient quantity in the future. Sustainable development presupposes the development of the productive structures of the economy along with the infrastructure for a sensitive attitude towards the natural environment and ecological problems (as defined by traditional sciences such as geography). Sustainability implies that natural resources are being exploited at a slower rate than the rate at which they are being renewed, otherwise environmental degradation will take place. Theoretically, the long-term effect of environmental degradation is the inability of the earth's ecosystem to support human life (ecological crisis).

#### Course Contents:

Ecological systems. The concept of ecosystem, Structure of the ecosystem, Flow of energy in the ecosystem, Biogeochemical cycles, Management of ecosystems, The terrestrial ecosystems in Greece. Residential Environment. Elements of the environmental landscape and its influencing factors, population dynamics, residential space, data on the current environment in the Mediterranean, population and economic activities, land uses, Spatial and urban organization, and Planning levels.

- The destruction of tropical forests.
- Floods and desertification.
- Coastline erosion and shore loss.
- Impact on biodiversity.
- Sustainable development.
- Ecologically sustainable cities.
- Strategic plans for the development of cities. I.
- Management of protected areas.
- Ecotourism, environmental tourism, rural tourism.
- Eco-labeling.
- Environmental education.
- Great ecological ideas- Missed opportunities.

### H SEMESTER

### Time Series Analysis (Department of Economics)

#### Learning outcomes:

On successful completion of this module students will be able to:

- Define and explain concepts such as stationarity and non-stationarity
- Developing forecasting models for time series with the use of an econometric software

package (e.g. E-views).

- Critically evaluate and assess time series models and their results
- Critically evaluate and assess the results of diagnostic tests.

Use models to make forecasts on time series.

**Course Contents:**

The module focuses on the analysis of time series which is one of the important types of data that are being used in the empirical analysis. The module aims to familiarize students with the necessary statistical concepts and the use of appropriate econometric techniques for the development of time series forecasting models with the use of an econometric software package (e.g. E-views).

Suggested Module Content:

- Introduction to time series
- Stochastic processes and basic concepts
- Autoregressive (AR) models
- Moving Average (MA) models
- Autoregressive and Moving Average (ARMA) models
- Autoregressive Integrated Moving Average (ARIMA) models
- Diagnostic tests and model selection criteria
- Forecasting
- Volatility models (ARCH-GARCH)

## Organisational Behavior and Development (Department of Economics)

**Learning outcomes:**

Organizational Behavior is a systematic field of study that examines the influence that individuals, groups, and structures have on the behaviors that occur within an organization. The teaching process aims to apply the necessary and specialized knowledge to improve the efficiency of organizations. Students will understand key concepts such as managing individual behavior, group behavior and interpersonal influence, organizational processes, organizational design, change, and innovation. The objective of the course is for students to understand the importance of concepts related to perception, motivation, decision-making, team dynamics, negotiation, conflict management, leadership, organizational culture, and change management. In this sense, the course is the basis on which one will understand how the principles of organizational theory can contribute to solving contemporary organizational issues.

Upon completion of the course, the student will:

- gain knowledge on the most advanced frontiers of organizational theory
- gain advanced and specialized skills and learn techniques, including synthesis and evaluation, required to solve critical problems in organizations.
- be able to use the knowledge in matters of organizational theory and to investigate and redefine the existing knowledge as well as the prevailing practices

**Course Contents::**

- Introduction to organizational behavior
- Person: individual differences
- Person: perceptions
- Person: Motivation
- Group behavior: formation and dynamics
- Group behavior: conflicts

- Organizational processes: power and leadership
  - Organizational processes: communication
  - Organizational processes: structure
- Change management

### Laboratory Research and Economic Development (Department of Chemical Engineering)

#### Learning outcomes:

The course: "Clean Energy Transition & Economic Development" aims to introduce students to the area of energy transition strategies at the regional, national, European, and international levels. To this end, the course places emphasis on the linkages of energy transition policies with sustainable and resilient economic development.

Within the above context, the course aims to familiarize students with international, European, national, and regional strategies for a just development transition to a low or neutral carbon economy.

Students are expected to acquire the ability to evaluate clean energy transition strategies through a critical and interdisciplinary approach, in the context of teamwork and individual assignment by each student.

#### Course Contents:

This course builds on the logic of a dynamic research laboratory. Based on this background, the course contents are articulated upon the following pillars:

#### The UN Context

- Agenda for Sustainable Development
- Paris Agreement

#### The EU Context

- Just Transition Mechanism
- 2050 long-term strategy
- Energy Union
- Clean energy for all Europeans package
- Equality Platform for Energy Sector

#### The National / Regional Context

- National Energy and Climate Plan (NECPs)
- Regional Just Transition Development Plans

#### Impacts of Clean Energy Transition on

- Economy
- Society
- Environment

#### Means of Clean Energy Transition

- Funding & Investment
- Green & Circular Economy
- Just Transition Governance
- Land restoration & repurposing

### Banking and Finance (Department of Economics)

#### Learning outcomes:

On successful completion of this module students will be able to:

- Explain and analyze the role and the benefits of financial intermediation.
- Describe various types of banking
- Explain the role of the central bank
- Critically assess the importance of banking regulations.
- Distinguish and describe the various risks that banks are exposed to.
- Describe, implement, and critically assess techniques that are being used in banking risk management.

**Course Contents:**

The module offers a solid background that covers fundamental principles of Banking, Banking regulation, and central banking. Emphasis is given to topics that correspond to the financial management of banks, the mapping of banking risks, and their management.

**Suggested Module Content**

- Financial Intermediation.
- Banking services.
- Types of Banking.
- Central Banking and Banking regulation.
- Bank failures.
- Financial statements of Banks
- Financial Management in Banking
- Bank risks (e.g. Interest rate risk, credit risk, liquidity risk, currency risk, market risk, country risk).
- Risk management in Banking



## Part D

### Other Useful Information

## D. Other Information

### D1. Academic Calendar

#### Courses, Exams, and Freshers Registration

(Dates are set by the Senate at the beginning of each academic year)

Submission of winter semester course applications	
Fall semester courses	
Fall semester exams	
Submission of Spring semester course applications	
Spring semester courses	
Spring semester exams	

#### Holidays and Student Holidays of the Fall Semester

28<sup>th</sup> October (National Holiday)

11<sup>th</sup> November (Liberation Day of Kastoria)

17<sup>th</sup> November (Anniversary of Polytechnio)

24/12-7/1 (New Year Holidays)

30<sup>th</sup> January (Patrons' of Knowledge Day -Trion Ierarhon-)

#### Holidays and Student Holidays of the Spring Semester

(Clean Monday)

25<sup>th</sup> March (National Holiday)

(Easter Holidays)

1<sup>st</sup> May (Laborers Day)

(June Student holiday -Agiou Pneumatos-)

### D2. Academic identity card – special ticket pass

In order to obtain the special ticket pass, students submit their application electronically at the <http://paso.minedu.gon.gr> website. Then, after the application has been approved by the Secretariat,

students can receive the special ticket pass from a specific delivery point, which they will have chosen when submitting their application. The special ticket pass provided ticket discounts to public transportation buses and coaches and trains.

### **D3. Student restaurant**

Students of the University of Western Macedonia are given the opportunity to eat at the University Restaurant, in accordance with the criteria and procedure provided by the current legislation, as well as by decisions of the Rectorate.

Students pay a low price per day for a full menu (breakfast, lunch, and dinner) or they can buy a monthly card that provides access to the restaurant services for breakfast, lunch and dinner seven days a week (excluding holiday periods).

### **D4. Healthcare**

All students (undergraduate, postgraduate, expatriate, and foreign) are entitled to health, medical, and nursing care for a period equal to the years of study provided as a minimum duration of undergraduate studies, increased by two years.

For this purpose, the University provides a special healthcare booklet. In case the student is directly or indirectly entitled to care by another insurance institution and wants the health care of a student, he/she must first waive the insurance from the other institution and choose that of the student with a solemn declaration of Law 1599/86, stating that "he/she is not insured with any other insurance institution".

Additional information about healthcare is provided in the Health Care booklet.

For the provision of a health care booklet, students should contact the Secretariat of their Department.

### **D5. Library**

The Library of the Kastoria campus of the University of Western Macedonia is located within the University Campus (Fourka area). The Library's objectives are:

- the right selection, acquisition, distribution, and effective management of the necessary material, in order to be able to support the educational or other activities of the University.
- the compilation and provision of bibliographic information based on the needs of its users in all fields of science.
- The continuous research and promotion of the needs of its users, based on the rapid development of technology, but also its application in the services of the Library.
- The effective management of its financial resources, but also the care to ensure the necessary scientific staff to accompany the Library, to support the current and future needs that arise in connection with the services offered.

#### **University Campus Library of Kastoria**

tel. +30 2467440006, 7, 8, E-mail (head librarian): [aboutsos@uowm.gr](mailto:aboutsos@uowm.gr)  
Fourka Area, 52100 Kastoria

For further information please visit the site below:

<https://library.uowm.gr/?lang=el>

## **D6. Erasmus +**

Students of the Department of Economics can participate in the European student exchange program entitled ERASMUS+. ERASMUS+ is the European Commission's new program for education, training, youth, and sport, which entered into force on 1 January 2014.

It incorporates previous EU programs for education, training, and youth such as, among others, the integrated Lifelong Learning Programme (LLP) (Erasmus, Leonardo da Vinci, Comenius, Grundtvig), the "Youth in Action" program and five international cooperation programs (Erasmus Mundus, Tempus, Alfa, Edulink and cooperation programs with industrialized countries).

Specifically, the ERASMUS+ student exchange program enables students who have successfully completed the 1st year of their studies and meet specific specifications to carry out part of their study program in a relevant Department of a European Academic Institution from a minimum of 6 (1 semester) to 12 Months (2 semesters) duration.

Since 2004, the University of Western Macedonia has been actively participating in the ERASMUS+ student exchange program and for this purpose, the already existing Departments of the UoWM have concluded a number of bilateral agreements with recognized academic institutions abroad.

Following a relevant call for expressions of interest, students submit a relevant application and after evaluation by the Departmental Head of the program, they are selected to participate in the program. In addition, because the ERASMUS+ program is constantly evolving and expanding its activities, it now gives students the opportunity to work in the framework of internships (practical placement) in organizations and companies abroad for up to 12 months.

### **Erasmus Officers**

Aikaterini Blanta, Erasmus+ Institutional Coordinator

Maria Koutzakoutsidou, Coordinator

Erasmus Office

Koila Kozanis

50150 - Greece

Tel: +30 24610-68065

Email: [erasmus@uowm.gr](mailto:erasmus@uowm.gr) & [int.relations@uowm.gr](mailto:int.relations@uowm.gr)

Erasmus coordinator for the Department of Economics: Prodromos Tsinaslanidis, Assistant Professor

For more information about Erasmus+, please visit the site below:

<https://erasmus.uowm.gr/>

## **Δ7. Centre for psychological support and counselling (MYFEO)**

The aim of the accessibility centre for Students of Vulnerable Social Groups is to enhance the physical, academic, and social access of students coming from vulnerable social groups (e.g., students with disabilities, low socioeconomic backgrounds, refugees, etc) while attending the University of Western Macedonia. Specific objectives of the accessibility center are to:

1. provide psychological support and counselling to university students from vulnerable social groups, students in general, the faculty and administrative staff of the university,



2. inform and support the faculty and administrative staff regarding the potential differentiating and inclusive strategies employed for students with disabilities,
3. enhance the accessibility of students with sensory disabilities to learning and instruction through sign language interpreters and Braille translators,
4. improve the accessibility of students with sensory and physical disabilities in the physical spaces of the university,
5. support the transportation of students with physical disabilities from and towards the University campuses.
6. grant housing scholarships to students from vulnerable social groups.

The scientific coordinator of MYFEO is Professor of Evolutionary Psychology Dimitrios Pneumatikos, of the Department of Primary Education.

For more information, contact the administrative staff of the accessibility center at <https://myfeo.uowm.gr/>

## **D8. Careers Office**

The Careers Office offers valuable information and counseling to University students and graduates on educational issues and career options and opportunities. It creates a bond between the academic community, employers, and the world of business.

The team of the Careers Office:

- provide information on the labor market and counseling
- inform about job vacancies and internships in the public and private sectors
- offer valuable information about graduate programs in Greece or other countries
- help students/graduates find out about available scholarships in Greece and abroad
- provide guidance on mobility and Lifelong Learning programs, training seminars, and conferences
- publish educational and career-related articles and information material
- organize events, workshops, seminars, and “Career Days” welcoming companies and organizations to participate
- draw up graduate employability and outcomes surveys – the results are used for actions planning and implementation in collaboration with companies
- offer students tips and guidelines about CV writing and job interviews

## **D9. E-mail Addresses**

### **Administration office**

[econ@uowm.gr](mailto:econ@uowm.gr)

### **Academic Staff**

Monovassilis Theodoros

[tmonovasilis@uowm.gr](mailto:tmonovasilis@uowm.gr)

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Siskou Thomas

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Tsinaslanidis Prodromos

[ptsinaslanidis@uowm.gr](mailto:ptsinaslanidis@uowm.gr)

Koronaki Eirini	<a href="mailto:ekoronaki@uowm.gr">ekoronaki@uowm.gr</a>
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Kalogiratou Zacharoula	<a href="mailto:zkalogiratou@uowm.gr">zkalogiratou@uowm.gr</a>
Psaradakis Georgios	<a href="mailto:psaradakis.georgios@gmail.com">psaradakis.georgios@gmail.com</a>

### **Special Technical Laboratory Staff**

Markopoulos Lazaros	<a href="mailto:markopoulos@kastoria.teiwm.gr">markopoulos@kastoria.teiwm.gr</a>
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### **D10. Kastoria**

One of the most beautiful cities of northern Greece, surrounded by the imposing mountains of Grammos and Vitsi, the famous city of furriers is reflected for centuries in the unspoiled waters of Lake Orestiada. Built amphitheatrically, on a narrow peninsula, it seduces visitors with its inexhaustible beauty, nobility, and serene aura.

Orestiada embraces an important avifauna, with more than 200 species, many of which are rare and threatened. Local fishermen in their Kastorian "ships", the plavas, compete masterfully with waterfowl with a prize of all kinds of lake fish.

A special attraction of Kastoria is the many, more than 60, Byzantine and post-Byzantine churches dating from the 9th to the 19th century. All of them are of the basilica type, except for Panagia Koumbelidiki, which took its name from its characteristic dome (koumbe). One of the most impressive, founded on the shores of the lake, is the Monastery of Panagia Mavriotissa (1802) which causes admiration with the frescoes of the katholikon, but also the external ones, depicting emperors of Byzantium. Also standing out are the churches of Taxiarches and Agioi Anargyroi (one of the oldest monuments of the city) in Doltso, Agios Stefanos, Agios Panteleimonas, and the Harvests of Theotokos in Apozari. The Museum of Byzantine Art (Dexameni Square) exhibits objects of the Byzantine period: over 700, perfectly preserved, portable icons from the temples of the city, sculptures, frescoes, and hagiographies.

### **Other attractions**

Dispilio (7 km SE of Kastoria). A pile-built prehistoric lake settlement has been excavated at the site of Nissi, which dates back to 5,000 B.C. Next to it, an impressive park has been formed with a natural representation of part of this settlement and information about the life of the inhabitants of the area about 7,000 years ago.

- The traditional village of Nestorio (28 km SW), where every summer on the banks of the Aliakmonas River the famous River Party is organized with the participation of well-known artists.

- The village of Nostimo (17 km SW), is known for its petrified forest, 20 million years old.

- The Korestia villages in the north of the prefecture. Although today most of them are deserted, they stand out for the unique atmosphere and the special construction of their houses of plinths, the so-called "mud houses".

- The ski resort of Vitsi, near the picturesque village of Polykeraso (22 km NE) for skiing and snowboarding.

Today Kastoria is a modern developed center that is classified in the category of medium-sized Greek cities based on its population and economic situation.

- The completion of the Egnatia motorway axis now makes access to Kastoria very easy
- Thessaloniki – Kastoria: 1 hour and 40min,
- Athens – Kastoria: 5 hours and 30min,
- Ioannina – Kastoria: 1 hour and 30min.

Access is also possible through the national airport "Aristotelis" which is located in Argos Orestiko (6 times a week connection with Athens).

**Information about the city of Kastoria can be found below:**

<http://www.kastoria.gov.gr/>



## Study Guide 2023-2024