**SCHOOL OF BUSINESS**

**DEPARTMENT OF MANAGEMENT SCIENCE AND TECHNOLOGY**

**https://www.dept.aueb.gr/dmst**



# UNDERGRADUATE STUDIES

# GUIDE

# 2021-2022

**ATHENS, APRIL 2022**

# ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

## THE RECTORATE AUTHORITIES

### RECTOR

Professor Dimitrios Bourantonis

### VICE RECTOR FOR ACADEMIC AFFAIRS AND PERSONNEL

Professor Vasilios Vasdekis

### VICE RECTOR OF RESEARCH AND LIFELONG LEARNING

Professor Gergios Lekakos

### VICE RECTOR OF FINANCIAL PLANNING AND INFRASTRUCTURE

Professor Konstantinos Drakos

### VICE RECTOR OF INTERNATIONAL COOPERATION AND GROWTH

Professor Vasilios Papadakis

## SCHOOL OF BUSINESS

### DEAN

Associate Professor Angeliki Poulymenakou

## DEPARTMENT OF MANAGEMENT SCIENCE AND TECHNOLOGY

### HEAD OF THE DEPARTMENT

Professor Nancy Pouloudi

### VICE CHAIRMAN

Associate Professor Emmanouil Kritikos

### SECRETARIAT

Chrysoula Sakellariou

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# 1. THE DEPARTMENT OF MANAGEMENT SCIENCE AND TECHNOLOGY

## 1.1. MISSION AND OBJECTIVES

Changes in the structure and nature of business operations have made technology a particularly important factor in organizational transformation of businesses. Thus, the development, exploitation and management of new technologies is inextricably linked to management science. Internal integration and inter-business interconnection of an organization's activities make each activity have a very significant impact on the activities of a whole chain of actions. At the same time, competition pushes businesses into strategic plans with high investment in technology. These plans, because they are radical, require substantial capital and contain a high risk. Both of these features to be effectively addressed require high-level human resources. At the same time, the Greek economy is currently looking for the organizational and managerial modernization of its businesses and organizations, which will enable them to improve their competitiveness index in today's internationalized reality.

A key prerequisite for achieving this goal is the preparation of qualified executives capable of making effective decisions for the benefit of business and the economy, using the modern environment of decision-making, technology and applications. Executives who will be able to work in the e-business environment under configuration.

The curriculum is designed to prepare high-level executives for businesses and organizations capable of successfully coping with the complexity of today's and future technological, economic and social challenges.

Upon successful completion of studies, the graduate will have developed problem-solving skills:

- combine knowledge from the scientific areas of management science, management, and information technology and systems and critically evaluate its application in practice
- demonstrate understanding of the managerial, technological, economic and social challenges that organizations face in the global context and deal with their complexity.
- use analytical methods and techniques to make effective operational and strategic decisions
- identify, formulate and solve management problems while applying critical thinking
- demonstrate the necessary leadership, managerial and entrepreneurial skills to play a key role in the companies and organizations of the future
- establish an innovative and entrepreneurial approach to identify business opportunities and deal with contemporary entrepreneurial challenges

From the above it follows that the differentiation and the originality of the studies program of the Department are the completion of the modern quantitative and technological background with the developed administrative knowledge and abilities offered to the students. This allows graduates of the Department to be particularly competitive in the labor market, since they will be able to effectively

address multidimensional managerial and business issues in the rapidly changing, highly competitive and developed technological environment.

The Department, with regard to the entrance examinations, belongs to the 4th scientific field (Economics and Informatics). It targets two categories of candidates:

- Those who want to study management science emphasizing on new skills where there is a strong element of applying quantitative methods to decision-making, logistics and supply chain, production and services, human resources management, business strategy, entrepreneurship and innovation.

- Those who want to combine information systems and technologies with an in-depth understanding of the management challenges that emerge from organizations and enterprises and their effects on organizational level.

**The Identity of the Department**

- The Department is unique in its specialization in Greece, combining modern management science with computer and communication technologies and organizational studies.

- The Department accepts 170 high level new students from the 4th scientific field.

- The Department has 21 resident faculty members, of which 40% hold a PhD from the top 20 universities in the world.

- The Department has 1 member of Laboratory Teaching Staff which performs mainly laboratory-applied teaching work.

- The Department has 3 members of Special Technical Laboratorial Staff which offer auxiliary teaching, as well as specialized technical laboratory services for the best execution of the educational, research and applied work.

- The scientific staff has a strong presence in academia worldwide, having achieved international recognition, and having taught at leading universities such as Wharton, LSE, LBS, etc.

- The curriculum of the Department is based on a well-organized, technocratic approach. It is internationally oriented (various visiting professors coming to teach every year, collaborations with leading universities are active within its undergraduate, postgraduate and research program).

- The Department focuses on research and development, with more than 25 international research collaboration projects with leading universities and research centers around the world and over 60 doctoral students.

- The Department has an educational laboratory with two (2) rooms with a total of 72 workstations. It also boasts five (5) excellently equipped research laboratories where researchers are currently employed.

    More precisely the research laboratories of the Department are:

- Management Science Laboratory - MSL

- Laboratory of Electronic Commerce and Electronic Business - ELTRUN

- Business Analytics Laboratory - BALab

- Management of formation Systems and Technologies Laboratory - ISTLab

- Laboratory of Management, Strategy and Entrepreneurship

- The Department runs, independently and in collaboration with other Departments, eight (8) high-level graduate programs which are attended by 250 students. Of these six (6) are full-time and part-time and two (2) only part-time (for working professionals).

  More specifically, the Postgraduate Programs offered or to which the Department participates are the following:

  - MSc in Management Science and Technology (Full and Part time)

  - MSc in Business Analytics (Full and Part time)

  - Master in Business Administration (MBA) International Program (In collaboration with other Departments, Full and Part time)

  - Executive MBA Program (In collaboration with other Departments, Part time)

  - MSc in Human Resource Management (In collaboration with other Departments, Full and Part time)

  - MSc in Public Policy and Management (Part time)

  - MA in Heritage Management (Collaborative program with University of Kent, and Department of Marketing and Communication)

  - MSc in International Shipping, Finance and Management(In collaboration with other Departments, Full and Part time)

- The Doctoral Program of the Department is one of the largest programs of its kind in Europe. Many of the doctoral students of the Department teach and participate in research projects, outside the Athens University of Economics and Business in Universities such as: Essex University, Ashton Business School, Copenhagen Business School, Bauhaus University of Weimar, University of Cyprus, Ionian University, University of Peloponnese, University of Patras etc. Also, doctoral students of the Department participate in important international conferences, and many have published articles in leading academic journals and have received international awards in the field of their specialization.

- The high level of studies in the Department is documented by the ability of graduates to pursue postgraduate studies at first line Universities of abroad and by the fact that Department's PhD holders submit publications in important international journals and have already taken up positions within and outside Greece.

## 1.2. PROGRAM OF STUDIES

The Department of Management Science and Technology offers a 4-year undergraduate degree that provides its graduates with the scientific knowledge and business-oriented practice required by contemporary job markets. Obtaining this degree requires the successful completion of thirty-nine (39) academic courses including a compulsory 3-month internship at designated organizations. The categories of courses which are offered by the department are:

**Compulsory Courses**

The Department's undergraduate degree includes twenty-eight (28) compulsory courses, which introduce students to the key concepts and fundamentals of Management Science and Information Technology. Hence the first five (5) semesters comprise solely of compulsory courses (25 in total), with an additional three (3) compulsory courses appearing during the sixth (6th), the seventh (7th) and the eighth (8th) semester, respectively.

**Stream and Elective Courses**

Stream and elective courses set the curriculum from the 6th semester to its completion. At the beginning of the 6th semester, students choose the steam they are specializing in, acquiring in this way in-depth knowledge and experience. The Department offers the following streams: "Operations Research and Business Analytics", "Operations and Supply Chain Management", "Software and Data Analysis Technologies", "Information Systems and Electronic Business" and "Strategy, Entrepreneurship and Human Resources". Each stream comprises six (6) complulosry courses and five (5) elctive coutses.

Each student should be successfully enrolled in a set of eleven (11) courses by selecting either (a) a single major stream or (b) two streams one major and one minor. Case (a) implies that the student is examined in six (6) courses of the major stream plus five (5) additional courses of his choice from the courses offered by the Department's curriculum. Case (b) implies that the student is examined in six (6) courses of the major stream plus three (3) courses of the minor stream plus any two (2) courses of his / her choice from the courses offered by the curriculum of the Department.

In this context, and under the supervision of the professors who choose to consult, students choose the courses that cover and serve their academic and professional goals. The specialized knowledge of the 6th and 7th semester is based on the scientific background of the first five semesters and is actively combined with the corresponding 8th Semester's Internship and Thesis which accompanies it.

Here are all the curriculum courses distributed per semester:

| 1st Semester (Total: 30 ECTS) | |
|---|---|
| 8101 Mathematics I | 6 ECTS |
| 8103 Introduction to Management | 6 ECTS |
| 8105 Introduction to Computer Science | 6 ECTS |
| 8107 Introduction to Marketing | 6 ECTS |
| 8181 Accounting | 6 ECTS |

## 2nd Semester (Total: 30 ECTS)

| | |
|---|---|
| 8102 Mathematics II | 6 ECTS |
| 8160 Quantitative Methods in Economics & Business I | 6 ECTS |
| 8106 Programming I | 6 ECTS |
| (Prerequisite of "Programming II" and "Algorithms and Data Structures") | |
| 8172 Accounting II | 6 ECTS |
| 8174 Introduction to Economic Theory | 6 ECTS |
| 8112 Contemporary Issues & Trends in Management & Technology | 6 ECTS |
| (Elective course only for 1st year students) | |

## 3rd Semester (Total: 30 ECTS)

| | |
|---|---|
| 8111 Decision Making | 6 ECTS |
| 8165 Quantitative Methods in Economics & Business II | 6 ECTS |
| 8115 Organizational Behavior and Leadership | 6 ECTS |
| 8117 Database Management Systems | 6 ECTS |
| (Prerequisite for "Business Intelligence and Big Data Analytics") | |
| 8119 Programming II (Requires "Programming I") | 6 ECTS |

## 4th Semester (Total: 30 ECTS)

| | |
|---|---|
| 8114 Human Resource Management | 6 ECTS |
| 8116 Mathematical Programming | 6 ECTS |
| 8113 Financial Management | 6 ECTS |
| 8120 Analysis & Design of Information Systems | 6 ECTS |
| 8162 Algorithms and Data Structures (Requires "Programming I") | 6 ECTS |

## 5th Semester (Total: 30 ECTS)

| | |
|---|---|
| 8121 Project Management | 6 ECTS |
| 8123 Optimization Methods in Management Science | 6 ECTS |
| 8125 Management and Information Technology | 6 ECTS |
| 8127 Work & Organizational Psychology | 6 ECTS |
| 8129 Information Systems Implementation and Architecture | 6 ECTS |

## 6th Semester (Total: 30 ECTS)

| | |
|---|---|
| 8142 Business Strategy (compulsory) | 6 ECTS |
| | |
| **Stream I: Operations Research and Business Analytics** | |
| 8134 Production & Operations Management | 6 ECTS |
| 8144 Topics in Operations Research and Decision Systems | 6 ECTS |
| | |
| **Stream II: Information Systems and Electronic Business** | |
| 8126 Analysis & Modeling of Business Processes and Systems | 6 ECTS |
| 8146 Electronic Commerce and Internet Applications | 6 ECTS |
| 8152 Digital Content Management & Human-Computer Interaction | 6 ECTS |
| | |
| **Stream III: Strategy, Entrepreneurship and Human Resources** | |
| 8136 Human Resource Management in the Digital Era | 6 ECTS |
| 8166 Product Design and Development | 6 ECTS |
| 8180 International Business Management | 6 ECTS |
| | |
| **Stream IV: Operations and Supply Chain Management** | |
| 8130 Quality Management | 6 ECTS |

| | |
|---|---|
| 8132 Supply Chain Management | 6 ECTS |
| 8134 Production & Operations Management | 6 ECTS |
| 8144 Topics in Operations Research and Decision Systems | 6 ECTS |

**Stream V: Software and Data Analysis Technologies**

| | |
|---|---|
| 8138 Software Engineering in Practice | 6 ECTS |
| 8152 Digital Content Management & Human-Computer Interaction | 6 ECTS |

**Elective Courses**

| | |
|---|---|
| Courses from any other stream | 6 ECTS |
| 8182 Ethics and Responsibility Issues | 6 ECTS |
| 8140 Final Year Project (spring semester) | 6 ECTS |

## 7th Semester (Total: 30 ECTS)

| | |
|---|---|
| 8154 Entrepreneurship (compulsory) | 6 ECTS |

**Stream I: Operations Research and Business Analytics**

| | |
|---|---|
| 8163 Financial Engineering | 6 ECTS |
| 8167 Stochastic Modeling & Simulation | 6 ECTS |
| 8143 Combinatorial Optimization | 6 ECTS |
| 8183 Business Analytics & Personalization Technologies | 6 ECTS |

**Stream II: Information Systems and Electronic Business**

| | |
|---|---|
| 8139 Information Resource Management | 6 ECTS |
| 8150 Digital Marketing | 6 ECTS |

**Stream III: Strategy, Entrepreneurship and Human Resources**

| | |
|---|---|
| 8135 Personal Skills Development | 6 ECTS |
| 8151 E-learning and Knowledge Management | 6 ECTS |
| 8169 Advanced Topics in Strategy and Innovation | 6 ECTS |

**Stream IV: Operations and Supply Chain Management**

| | |
|---|---|
| 8133 Analysis and Planning of Distribution and Transportation Systems | 6 ECTS |
| 8159 Enterprise Resource Planning Systems | 6 ECTS |

**Stream V: Software and Data Analysis Technologies**

| | |
|---|---|
| 8137 Business Intelligence and Big Data Analytics | 6 ECTS |
| 8183 Business Analytics & Personalization Technologies | 6 ECTS |
| 8185 Applied Machine Learning | 6 ECTS |
| 8187 Social Network Analysis | 6 ECTS |

**Elective Courses**

| | |
|---|---|
| Courses from any other stream | 6 ECTS |
| 8131 Investment Analysis | 6 ECTS |
| 8151 E-learning and Konowledge Management | 6 ECTS |
| 8177 Special Approaches to Leadership | 6 ECTS |
| 8191 Development and Design of Mobile Applications | 6 ECTS |
| 8193 Employability Development in the Digital Age | 6 ECTS |
| 8149 Final Year Project (fall semester) | 6 ECTS |

## 8th Semester (Total: 30 ECTS)

| | |
|---|---|
| 8156 Internship - Thesis (compulsory) | 12 ECTS |

**Stream II: Information Systems and Electronic Business**
8164 Digital Innovation and  Entrepreneurship                                   6 ECTS

**Elective Courses**
8168 Organizational Theory                                                      6 ECTS
8170 Big Data Management Systems                                                6 ECTS

Where no prerequisite courses are mentioned, the curriculum is indicative, but it is recommended to follow the proposed course sequence and distribution per semester. However, due to the specificity of the requirements of Internship and Thesis in the 8th semester, students have the option of attending an additional elective course in the 6th and/or 7th semester.

**Distribution of Courses / Credits (ECTS) per Stream**

The following table shows the distribution of ECTS credits per stream of study, for the 6th, 7th and 8th semester:

| Stream 6th semester | I Courses | ECTS | II Courses | ECTS | III Courses | ECTS | IV Courses | ECTS | V Courses | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|
| C | 1 | 6 | 1 | 6 | 1 | 6 | 1 | 6 | 1 | 6 |
| SC | 2 | 12 | 3 | 18 | 3 | 18 | 4 | 24 | 2 | 12 |
| SE | 2 | 12 | 1 | 6 | 1 | 6 | - | | 2 | 12 |
| | | 30 | | 30 | | 30 | | 30 | | 30 |

| Stream 7th semester | I Courses | ECTS | II Courses | ECTS | III Courses | ECTS | IV Courses | ECTS | V Courses | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|
| C | 1 | 6 | 1 | 6 | 1 | 6 | 1 | 6 | 1 | 6 |
| SC | 4 | 24 | 2 | 12 | 2 | 12 | 2 | 12 | 4 | 24 |
| SE | - | | 2 | 12 | 2 | 12 | 2 | 12 | - | |
| | | 30 | | 30 | | 30 | | 30 | | 30 |

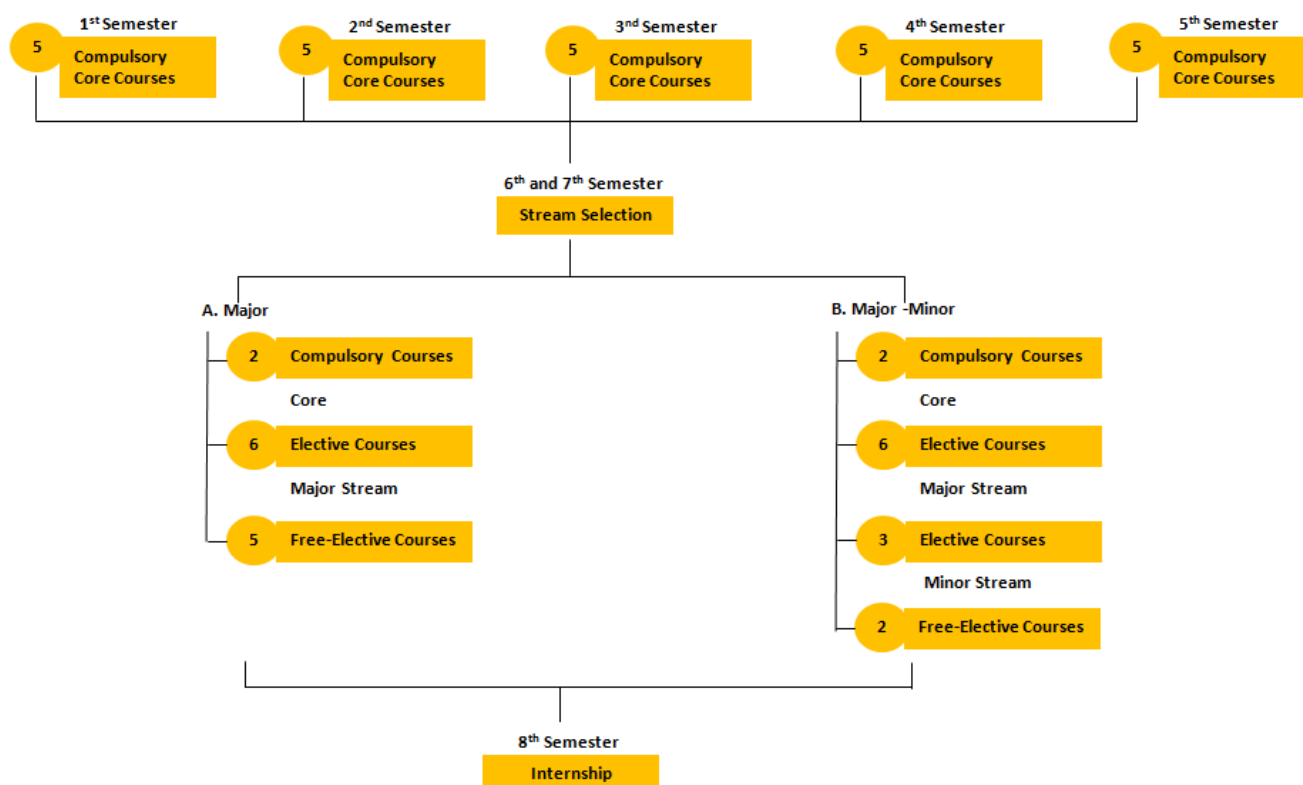| Stream 8th semester | I Courses | ECTS | II Courses | ECTS | III Courses | ECTS | IV Courses | ECTS | V Courses | ECTS |
|---|---|---|---|---|---|---|---|---|---|---|
| C | 1 | 12 | 1 | 12 | 1 | 12 | 1 | 12 | 1 | 12 |
| YK | - | | 1 | 6 | 1 | 6 | - | | - | |
| SE | 3 | 18 | 2 | 12 | 2 | 12 | 3 | 18 | 3 | 18 |
| | | 30 | | 30 | | 30 | | 30 | | 30 |

 Memorandum:

C = Compulsory (for all streams)
SC = Stream Compulsory
SE = Stream Elective

## 1.3. PROGRAM OF STUDIES STRUCTURE



## 1.4. COURSES, TEACHING, EXMAS AND GRADUATION

### 1.4.1 Information for the courses

**Foreign Language**

The foreign language course is optional. Students can choose one of the three foreign languages (English, French, German) taught at the University. The foreign language course marking of the first two years (English I, II, III, IV, French I, II, III, IV, German I, II, III and IV) is not taken into account in the calculation of the average of the degree. The foreign language course marking of the third year (English V, VI, French V, VI, German V, VI) is taken into account in calculating the average grade of the degree, but without being taken into account in the required number of courses for the degree.

**Contemporary Issues and Trends in Management and Technology**

This course is optional. Only students of the first year can select it. It is taught in the 2nd semester of studies. The grade of the course is taken into account in the calculation of the average grade of the degree. However, it is not taken into account in the number of courses required for a degree.

**Final Year Project**

From the 6th semester, students are allowed to perform a (mainly research) project under the close supervision of a faculty member of the Department. It is an elective course.

**Teacher Education Program**

University operates a program in Sciences of Education and Training. This program is one-year (2 semesters) and is addressed to graduate students (7th, 8th semester). The courses are:

- Introduction to Pedagogical Science

- General and Developmental Psychology

- Educational evaluation

- Special Didactic Methodology -Teaching of Specialty Courses (Economics and Informatics)

- Quality in education and teaching

- Organization and management of education and training units

- Introduction to Teaching Methodology - Analytical Programs

- Introduction to Computers - Pedagogical applications in education

- Practical Exercise in Teaching I

- Practical Exercise in Teaching II

More infroramtion about the program: https://www.dept.aueb.gr/en/tep

### 1.4.2 Teaching, Course Registration and Reassessment

**Course Teaching Duration**

- Course teaching and examination duration is eight (8) semesters

- The courses are taught for thirteen (13) weeks every semester

- Each course is taught for four (4) hours per week

- Each course has a credit load of six (6) ECTS units and twelve (12) for the Internship

**Workshops and Laboratories**

In most courses of the curriculum, teaching is complemented by specialized tutorials, where exercises are solved and student questions are discussed. In the Educational Laboratory of Management Science and Technology, specialized labs are also held in courses utilizing information infrastructures.

**Course Registration**

Course registration takes place twice during the academic year (following a relevant announcement by the University, with an exclusive submission deadline): a) October (winter semester courses) and b) February (spring semester courses). Course registration is compulsory in order to: i) take part in the examinations of the courses and ii) obtain the textbooks of the courses they have chosen.

It is noted that in September students can only be examined in the courses they have already chosen in the winter and spring registration of the current academic year.

**Course Reassessment**

Students have the right to be re-examined in four (4) courses throughout their studies. They may apply for a reassessment only for the next examination period, i.e. courses given in January or June of one academic year have the right to review only in the following September examination period, while courses given in September have the right to be re-examined in the followed by a January or June examination period.

Those students who have completed graduation requirements and apply for oath taking, automatically lose the right to reassessment.

### 1.4.3   Exams, Marking and Graduation
**Exams**

At the end of each semester, students take written exams for each course. There are three examination periods:

- January (written exams for fall semester courses)

- June (written exams for spring semester courses)

- September (written exams for both fall and spring semester courses)

**Graduation Requirements**

- Registration and monitoring for at least 8 semesters

- Follow-up and successful examination in 39 courses

- Successful completion of Internship and Thesis in the 8th semester

**Marking Scheme**

The grade for each course is expressed in the number range from zero (0) to ten (10), including half points. The passing mark is five (5). The Rating Scale for a degree, which is calculated based on the average of all courses, is as follows:

10 - 8,51     Honours

8,50 - 6,51   Very Good

6,50 - 5       Good

### 1.4.4   Projects Awards

The Department has established awards for the best student assignments related to curriculum subjects. Thus, at the beginning of each year, prizes are awarded to groups of students whose work was distinguished in the previous academic year.

## 1.5. STREAMS, INTERNSHIP, PROSPECTS AND ALUMNI ASSOCIATION

### 1.5.1 Streams

The five available streams that the studies program offers are as follows:

- Stream I: Operations Research and Business Analytics
- Stream II: Information Systems and Electronic Business
- Stream III: Strategy, Entrepreneurship and Human Resources
- Stream IV: Operations and Supply Chain Management
- Stream V: Software and Data Analysis Technologies

**Stream I: Operations Research and Business Analytics**

Operational Research, as a traditional approach to decision-making solutions in conjunction with Business Analytics as a modern and expanded view, is an evolving scientific area that is experiencing a re-acne in the last decade, precisely because of the increased size and complexity of modern decision-making problems.

This stream provides both methods of data analysis and methods for mathematical modeling and computational solution of all applications, which are analyzed within the Department's curriculum (Logistics, Production, Services, Finance, Human Resources Management, Project Planning). The emphasis in this stream is more on the methods and mathematical or algorithmic foundations of applications and computational problems.

Therefore, the directional design aims at a horizontal (rather than vertical) approach of all applications, in order for the graduate to be flexible and competitive in the labor market. This means that the graduate will be able to work equally successfully as an analyst within a specialized business (in the fields of production and services, logistics and transport, finance, project management, etc.) and as a business consultant within an advisory company that serves other organizations.

At the same time, the horizontal approach of direction leads to the construction of a solid background in analytical and computational decision making methods combined with data analysis methods. This background can support multiple subjects at postgraduate level (from Computer Science to Business Administration and, of course, Business Analytics). The content of the stream courses includes:

- Deepening in Operations Research and Decision Making methodologies
- The examination of fundamental and specialized Production and Operations Management issues
- The thorough examination of Financial engineering methods
- The design of Combination Optimization algorithms and methods
- The Modeling of stochastic decision-making problems through stochastic processes or simulation
- Deepening in Business Analytics issues, particularly in personalization technologies as well as data analysis in the supply chain.

The set of courses includes modeling and analysis-solving applications and case studies, as well as introducing relevant software or programming algorithms.

**Stream II: Information Systems and Electronic Business**

Objectives of the Information Systems and Electronic Business stream are:

- To provide through the courses offered specialized knowledge both in theory and (more importantly) in practical application, for the main categories of information technologies applied in the business and organizational environment, in all phases of their development and administration, with an emphasis on e-business

- To capitalize and specialize the basic computer literacy and computer skills acquired by the student in the first years of his studies through the compulsory computer courses he has attended

- To create the required background for modern and up-to-date knowledge and skills of IT development:
  - Apps and software re-use,
  - Business Analytics,
  - User experience (UX),
  - Business Process Modelling and ERP,
  - Information Resource Management

- The practical application of the above to the creation of innovative business models / services / businesses in a real environment with emphasis on the exploitation of new technologies

Graduates of the stream can work:

- As specialists in e-commerce, digital marketing, web applications / services, etc.

- As executives in positions of analysts, programmers or project managers of information systems

- As specialists in new specialties related to: social networks, mobile application development, e-learning, internet businesses, knowledge management, digital media and digital marketing

- As executives (and founders) of innovative new businesses that use new technologies with emphasis on the Internet, mobile devices and other digital media

**Stream III: Strategy, Entrepreneurship and Human Resources**

The aim of the stream is to provide students who choose it, the knowledge and skills required for the management of enterprises and organizations in the context of complex processes involved in the business environment, taking into account the changing labor relations and the important role of human resources.

The Strategy, Entrepreneurship and Human Resources stream is designed to:

- to provide, through its courses, knowledge both in theory and practice, on issues of human resource and leadership management, as well as on issues of innovation, strategy and implementation of strategic changes in the context of the internationalized economy
- to shape thinking and to develop the administrative, organizational and personal skills required by corporate executives and organizations to cope with modern challenges
- to help students who choose it to understand the interaction of business strategy with effective human resource management for the benefit of the business
- to assist graduates interested in entrepreneurship in understanding the functions and the role of human resources in a small business or a start-up
- to explore the potential of innovation and strategy in dynamic new entrepreneurship
- and help through the practical application of the above to the creation of innovative business models / services / businesses in a real environment with emphasis on the exploitation of new technologies

Graduates of this stream can be employed as:
- Executives for every business and organization
- Executives in human resources
- Executives in consultancy
- Consultants - external business partners
- Businessmen


**Stream IV: Operations and Supply Chain Management**

Competitiveness constitutes a key success factor for any contemporary business activity. However sustaining and enhancing business competitiveness involves producing and offering the right product, at the right time, the right place and at the right price and conditions. Operations and Supply Chain Management contributes substantially to this goal through designing and managing the integrated process of manufacturing and delivering products and/or services to markets. In particular, Operations Management aims at designing and managing the operations for producing products and/or services in an efficient and cost-effective way. Supply Chain Management aims at designing and managing the flow of materials, products, and information from suppliers to end-customers in order to offer the products and/or services at the desired time and place and at the minimum logistics cost. Integrated management of business operations and supply chain activities is envisaged in all industries.

In this context, the Operations & Supply Chain Management stream (unique in undergraduate studies offered by Greek Universities) covers the following areas
- Design, planning and control of business operations for manufacturing products or producing services.
- Designing and Coordination of the relationships of the companies and organizations participating in a supply chain

- Planning and control of Logistics Systems, including procurement, warehousing, transportation, and distribution.

The objective of this stream is to provide students of the Department of Management Science and Technology with the skills to design, manage, and assess the entire spectrum of business operations of a company taking into account their interrelationships. The knowledge and skills offered by this stream will enable the student to pursue the following job opportunities:

- Executive or Analyst in a Product or Service Design/Manufacturing department of any type of company

- Executive or Analyst in a Supply Chain Management or Logistics department of any of company

- Executive or Analyst in 3PL, 4PL or a private or public Transport Company

**Stream V: Software and Data Analysis Technologies**

The accumulation of large volumes of data has brought dramatic changes to both day to day and business. Using advanced analysis techniques, business intelligence, and artificial intelligence, we can predict behaviors, discern trends, strategize, and study systems with unprecedented precision. At the same time, Software Technology gives us the tools with which we can work effectively to make such analyzes. It also gives us the skills we can create complete services not only for data analysis but for the implementation of innovative ideas and initiatives.

This stream gives students the necessary knowledge to be able on the one hand to design and implement programs and digital services, on the one hand to collect, process, and analyze large amounts of data. Direction courses therefore move on two axes:

- Programming technologies and tools, code development methods, advanced implementation techniques.

- Data processing and organization techniques, artificial intelligence applications, business analytics, and data science.

Graduates of the department who will choose the stream of Software Technologies and Data Analysis have brilliant prospective developments:

- In the academic field, they can continue their studies at postgraduate level either in computer programs or in programs of analytical, data science, and artificial intelligence.

- In the professional field, the labor market in both IT and data analysis is robust and the demand for graduates with specialized knowledge has been and remains very strong.

Finally, the stream provides an additional asset: students will have a deeper and more meaningful understanding of the technologies that have already greatly influenced and will continue to change our lives in the coming decades. In the context of the increasing automation of work that until recently was considered beyond the reach of the computer, such knowledge is the best guarantee we can have for the future, both as workers and as citizens.

### 1.5.2 Internship and Thesis

It is a compulsory course for all students. To participate in the Internship, students must have a minimal level of formal knowledge. Internship has a duration of three months and is implemented in the 8th semester of study in a company or organization. The final grade is based on the final report and the progress during the Internship.

**Internship** is an obligation of the students during the **8th semester of studies of the Department** and within its framework the students are employed in a real business environment by utilizing and completing the knowledge they have acquired The fundamental goal of the internship is to gain work experience so that students have an important asset for their future professional career. Familiarizing them with actual operating parameters of a modern enterprise, passing from theory to practice, and forming a relationship with a company that can potentially become a future employer are key components of the course.

Students are employed in Departments / Operations (e.g. Marketing, Finance, Production, Personnel) of the business offering to host them. During the internship, they are familiar with the functions, practices and administrative systems applied by the company and participate in them, under the guidance of an executive for that purpose. At the same time, their employment is supervised by a Professor of the Department.

Alternatively, the students are employed in a specific and project-specific project that has been agreed with the internship coordinators and falls within the Department's disciplines. There is also the opportunity for students to participate in the development of a new entrepreneurial activity that interests a company.

In both cases internship is accompanied by a targeted Bachelor Thesis, which is linked to the content of the internship itself and at the same time extends to wider academic and research topics, to a certain extent through an extensive bibliographic research.

The following tables summarize some statistics regarding the content of the internship in the Department of Management Science and Technology.

| Part of the company in which internship is being developed | Percentage of trainees |
|---|---|
| Marketing | 15.5% |
| Information Technology | 14.0% |
| Human Resources | 11.0% |
| Financial Management | 10.0% |
| Sales | 10.0% |
| General Management | 8.5% |
| Logistics | 6.5% |
| Quality Management | 4.5% |
| Project Management | 4.5% |
| Customer Support | 4.0% |
| Other | 11.0% |

| Main tasks within the Internship | Percentage of trainees |
|---|---|
| Development of IT applications | 20.0% |
| Analysis and modeling of business processes and systems | 19.5% |
| Completion of processes and systems | 18.5% |
| Study of evaluation and quality systems | 11.0% |
| Market and competition research | 10.5% |
| Development and import of products and services | 6.5% |
| Economic and technical studies | 5.0% |
| Development of models and algorithms | 5.0% |
| Development of business plans | 4.0% |

| Main activity of the company in which the internship is being developed | Percentage of trainees |
|---|---|
| Information Technology and Telecommunications | 20.0% |
| Commerce | 14.5% |
| Financial Institutions | 13.5% |
| Consulting Companies | 11.0% |
| Services | 10.0% |
| Retailing | 8.0% |
| Industry | 7.0% |
| Food/Drinks | 6.5% |
| Public Organizations | 6.5% |
| Other | 2.5% |

### 1.5.3    Career Prospects

Today, and even more in the future, companies and organizations are facing new challenges which cannot be tackled by executives of traditional specializations. It takes executives who, in addition to their specialization in Business Administration (Finance, Marketing, Accounting, Sales, Human Resources Management, etc.) will be able to manage and use the combination of Management Science with modern technological (Information Technology, Telecommunications, Quantitative Methods) so that they can understand, design and implement integrated business functions, processes and systems as well as business activities.

Graduates of the Department due to their integrated technological and managerial background are competitive as executives and consultants in:

**All the traditional Business Management specializations in the new e-business environment, innovation, rapid organizational developments and business uncertainty such as:**

- Production Management
- Human Resource Management

- Marketing and Sales

- Accounting and Finance, etc.

**Cutting-edge specializations such as:**

- Supply Chain Management and Services

- Logistics and Transportation

- Analysis and Design of Information Systems

- Information and Telecommunication Resource and Systems Management,

- Quantitative Methods in Business Administration (Operational Research)

- Financial Engineering

- Project Management

- Analysis and Modeling of Business Processes and Systems

- Electronic Commerce and Digital Marketing

- Internet and New Digital Distribution and Sales Channels

- Software Engineering

- Enterprise Resource Planning Systems

- Databases

- Knowledge and Learning Management

- Innovation and Entrepreneurship Management

- Organizational Behaviors and Leadership

- Business Strategy


Many of our graduates **are already working** in well known Greek and multinational companies such as: Piraeus Bank, Kraft, CGU Insurance, EFG Eurobank, Bank of Cyprus, TITAN, Johnson & Johnson, Germanos, Athens International Airport, Schneider Electric, Siemens, TOYOTA, Citibank, Info-Quest, HSBC, Piraeus Direct Services, PLAISIO, Egnatia, KPMG, Accenture, HOL, Intersys, Nestle, Mails AE, National Bank, CleverBank, etc.

Every year, more than 20 graduates of the Department continue their studies in postgraduate programs (MSc, MBA, MPhil) at leading Universities in Greece and abroad (e.g. Harvard, Columbia, UCLA, Michigan, Duke, Cambridge, Oxford, of Economics, Bocconi etc) on issues such as:

- Business Administration

- Supply Chain Management and Services

- Logistics and Transportation

- Operational Research

- Business Analytics

- Accounting and Finance

- Computer Science

- E-business and Digital Media

- Human Resource Management

- Marketing

- Economics

### 1.5.4 Alumni Association

The Alumni Association of the Department of Management Science and Technology of the Athens University of Economics and Business was founded in the summer of 2004 by an innovative effort of the first graduates of the Department of Management Science and Technology (http://www.dmstalumni.com/). Since February 2005, it is an association recognized by the Single-Member First Instance Court of Athens (unique case for Greek standards) and has actively started its activities. The primary goals of the club are:

- The development of communication and cooperation among its members.

- The general promotion and support of its members in the professional, social and scientific fields.

- The promotion of the Department of Management Science and Technology, as well as the participation of the members of the Association in the upgrading of its level.

- The cultivation of the permanent and continuous contact with the University and in particular with the Athens University of Economics and Business, as well as the continuous updating and training on relevant developments in the field of Management Science and Technology.

- The organization of events aiming at the constant updating and contact of the members with the contemporary economic and business problems.

- The cooperation with the faculty members of the department and the students for the upgrading of the studies and the support of educational and professional initiatives.

From these goals, the Alumni Association is trying to focus more on areas that add value to graduates in the department. The most important of these is the interconnection of its members. The mutual support of a group of people such as graduates of the particular department involved in common subjects, contributes not only to the professional rehabilitation of graduates but also to their support throughout their professional career. Another important area of interest of the association includes claiming, safeguarding and defending the professional rights of graduates. In addition, in order to achieve this goal, the association seeks close cooperation with professional associations of the department's scientific areas.

The alumni association is trying to support as much as its members as well as the students of the department in cooperation with the Department of Management Science and Technology. For this purpose, seminars are organized on various topics such as "Job Search Techniques" and "Postgraduate

Studies", while there is continuous briefing on conferences and events in the department's subjects. In the near future it is planned to organize a career day exclusively for the association members.

## 1.6. FACULTY AND STAFF OF THE DEPARTMENT

### 1.6.1 Resident Faculty Members

Professor **I. Voudouri (Business Strategy and Entrepreneurship**): Diploma in Electrical Engineering, NTUA, B.Sc. Ecole Natinale Superieure des Telecommunications (ENST), TELECOM - Paris ", Diplome d' Etudes Approfondies (D.E.A.), Universite Paris X / H.E.C / E.S.S.E.C, Ph.D. Universite Paris X - Nanterre.

Professor **A. Vrechopoulos (Digital Media and Personalized Services):** B.Sc. in Applied Informatics, AUEB, M.B.A. Athens Laboratory of Business Administration, Ph.D. in Electronic Retailing & Marketing, Brunel University (UK).

Professor **G. Doukidis (E-Business):** B.Sc. in Mathematics, Aristotle University of Thessaloniki, M.Sc. in Operations Research and Ph.D. in Simulation / Artificial Intelligence, London School of Economics and Political Science.

Professor **G. Ioannou (Production and Operations Management):** Diploma in Mechanical Engineering, NTUA, M.Sc./D.I.C. in Industrial Robotics and Manufacturing Automation, Imperial College of Science, Technology and Medicine, Ph.D. in Mechanical Engineering, University of Maryland.

Professor **G. Lekakos (Business Utilization of Digital Content):** B.Sc. in Mathematics, Aristotle University of Thessaloniki, M.Sc. in Advanced Methods in Computer Science, University of London, Ph.D. in Management Science and Technology, AUEB.

Professor **I. Nikolaou (Organisational Behaviour and Human Resource Management):** B.Sc. in Psychology, University of Crete, M.Sc. and Ph.D. in Organizational Psychology, University of Manchester, Institute of Science & Technology (UMIST).

Professor **N. Pouloudi (Management of Information Systems):** Degree in Informatics, AUEB, Postgraduate Certificate in Teaching and Learning in Higher Education, Brunel University, M.Sc. and Ph.D. in Information Systems, London School of Economics and Political Science..

Professor **A. Refenes (Management Science with emphasis on Financial Engineering):** B.Sc. in Mathematics and Computing, Polytechnic of North London, Ph.D. in Computing, University of Reading.

Professor **E. Soderquist (Innovation and Knowledge Management):** B.Sc. and M.Sc. in Industrial Engineering, Royal Institute of Technology, Stockholm, Ph.D. in Business Administration, Brunel University.

Professor **I. Spanos (Business Strategy):** B.A. in Business Administration, Master in Business Administration (M.B.A.) AUEB and University of Birmingham, Ph.D. Operations Research and Marketing, AUEB.

Professor **D. Spinellis (Software Technology):** M.Eng. in Software Engineering and Ph.D. in Computer Science (1994) of Imperial College of Science, Technology and Medicine.

Professor **Ch. Tarantilis (Quantitative Methods for Production and Services Management):** B.Sc. in Mathematics, University of Patras, M.Sc. in Operations Research, London School of Economics and Political Science, Ph.D. in Operational Research and Logistics NTUA.

Associate Professor **E. Kritikos (Operational Research and Information Systems):** Degree in Mathematics, National & Kapodistrian University of Athens, M.Sc. in Information Technology and Operations Research, National & Kapodistrian University of Athens, Ph.D. in Computer Science and Management, AUEB.

Associate Professor **P. Louridas (Software Technology and Algorithmic Applications):** B.Sc. in Informatics, National & Kapodistrian University of Athens., M.Sc. by Research, University of Manchester, Ph.D. in Software Engineering, University of Manchester.

Associate Professor **I. Mourtos (Business Research Mathematics):** Diploma in Computer Engineering & Informatics, University of Patras, M.Sc. and Ph.D. in Operations Research, London School of Economics and Political Science.

Associate Professor **A. Poulymenakou (Management of Information Systems):** Degree in Mathematics, National & Kapodistrian University of Athens, M.Sc. and Ph.D. in Information Systems, London School of Economics and Political Science.

Associate Professor **K. Pramatari (Information Systems with emphasis on Supply Chain):** B.Sc. in Informatics, M.Sc. in Information Systems and Ph.D. in Management Science and Technology, AUEB.

Associate Professor **D. Chatziantoniou (Decision Support with Analytical Data Processing):** B.Sc. in Applied Mathematics, National & Kapodistrian University of Athens, M.Sc. in Computer Science, New York University, Ph.D. in Computer Science, Columbia University.

Assistant Professor **K. Androutsopoulos (Analysis & Programming of Distribution and Transport Systems):** Degree in Mathematics, National & Kapodistrian University of Athens, M.Sc. in Statistics and Operations Research, University of Essex., Ph.D. in Management Science and Technology, AUEB.

Assistant Professor **I. Deligianni** (under appointment) **(Business Administration):** B.Sc. in Chemical Engineering, NTUA., M.Sc. in Business Administration, AUEB, Ph.D. in Management Science and Technology, AUEB.

Assistant Professor **E. Zachariadis (Management Science - Quantitative Methods):** Diploma in Chemical Engineering, NTUA, M.Sc. in Computing Science, Imperial College London, Ph.D. School of Chemical Engineering, NTUA.


## Professors Emeritus

Professor **Andreas Kintis** (former rector of AUEB): Bachelor in Economics, AUEB, M.Sc. in Economics, University of Wisconsin, Ph.D. in Econometrics, University of Manchester.

Professor **Spyridon Lioukas:** Bachelor of Engineering, NTUA, M.Sc . in Operational Research, NTUA , Ph.D. London Business School.

Professor **Panagiotis Miliotis:** Bachelor of Mechanical and Electrical Engineer, NTUA, M.Sc. and Ph.D. in Operations Research, London School of Economics and Political Science.

Professor **Gregory Prastacos:** B.Sc. and M.Sc. in Computer Science, Ph.D. in Operations Research of Columbia University.

The following table presents the Head and Vice Chairman of the Department, from its foundation until today:

|  | 1999-2001 | 2001-2003 | 2003-2005 | 2005-2006 | 2006-2008 | 2008-2010 |
|---|---|---|---|---|---|---|
| **Head** | P. Miliotis | G. Doukidis | G. Doukidis | S. Lioukas | K. Zografos | K. Zografos |
| **Vice Chairman** | G. Doukidis | A. Refenes | D. Bourantas | G. Doukidis | G. Doukidis | D. Spinellis |
|  | 2010-2012 | 2012-2014 | 2014-2016 | 2016-2017 | 2017-2020 | 2020-today |
| **Head** | G. Ioannou | Ch. Tarantilis | A. Pouloudi | G. Giaglis | D. Spinellis | A. Pouloudi |
| **Vice Chairman** | D. Bourantas | A. Pouloudi | K. Pramatari | I. Voudouri | I. Nikolaou | E. Kritikos |

### 1.6.2 Laboratory Teaching Staff

**Christos Lazaris:** B.Sc. in Physics, National & Kapodistrian University of Athens., M.Sc. in E-Commerce (MBA equivalent), Athens University of Economics & Business, Ph.D. in Management Science and Technology, Athens University of Economics & Business.

### 1.6.3 Special Technical Laboratorial Staff

**Stavros Grigorakakis:** B.Sc. and M.Sc. in Physics, National & Kapodistrian University of Athens.

**Sofoklis Stouraitis:** B.Sc. in Mathematics, Direction of Computational Mathematics and Informatics, University of Patras, M.Sc. in Information Systems, Department of Informatics, Athens University of Economics & Business.

**Vasiliki Tagalaki:** B.Sc. in Mathematics, University of the Aegean, M.Sc. in Information Systems, Department of Informatics , Athens University of Economics & Business.

### 1.6.4 Administrative Staff

**Secretariat of the Department**

**Chrysoula Sakellariou** (Secretariat): Bachelor of the Faculty of Primary Education, National and Kapodistrian University of Athens.

**Victoria Filippopoulou** (Vice Secretariat): : Bachelor of the Faculty of English Language & Literature, School of Philosophy, National and Kapodistrian University of Athens

**Angelos Vezyrellis**: Bachelor of the Department of Business Administration, Aegean University, M.Sc. in Human Resource Management (HRM), Athens University of Economics and Business.

**Kelly Vourloumi:** Bachelor of the Faculty of Management and Economics, Department of Tourism Management, Athens University of Applied Sciences, Technological Educational Institute of Athens, M.Sc. in Public Economics and Policy, Faculty of Management and Economics, Department of Accounting and Finance, Technological Educational Institute of Piraeus.

**Public Relations**

**Maria Kontouli:** Bachelor of the Department of Communication and Mass Media, National and Kapodistrian University of Athens, M.Sc. in European Studies for Business Executives and Organizations, Athens University of Economics and Business.

## 1.7. EVALUATION PROCEDURES OF THE DEPARTMENT

In the last few weeks of each semester, a course / student assessment is carried out by the students, aiming at the continuous improvement of the curricula and the teaching work of the Department. The evaluation is carried out by completing a specific questionnaire prepared centrally by the institution for this purpose.

The results are discussed and analyzed in the General Assembly with the aim of overall upgrading of the educational process by all the teachers and problem solving where necessary. On the basis of the results of the evaluations, the General Assembly decides and performs each year the "Title of High Didactic Performance" (a title which is very important to the Universities of North America and Europe).

Apart from the above, an annual evaluation of the faculty members of the Department is under way. The annual progress reports of the faculty members and the evaluation process take place every autumn (coordinated by the Vice Chair) to properly planning for next year. The desired criteria of the Department for the various grades (quantitative or qualitative) are known to the stakeholders and refer to five categories: a) Publications in International Scientific Journals, b) Research, c) Quality and Participation in Education, d) International Scientific Activity, and e) Administrative Work in the University and Professional initiatives.

The Department has also submitted two internal evaluation reports to date, one in February 2009 and one in September 2013.

Also, it should be noted that the Department was evaluated in November 2013 according to the standards of the Hellenic Quality Assurance and Accreditation Agency (HQA). The External evaluation was attended by distinguished professors from leading international universities (Aston University, UK, London, UK, California State University, USA, Frederick University, Cyprus, Cardiff University, UK).

Finally, The Undergraduate Study Program of the Department of Management Science and Technology received, by the Hellenic Quality Assurance and Accreditation Agency, a four-year certification (valid from 17/07/2019 to 16/07/2023). The certification was granted, as after the completion of the prescribed procedures, it was proven that the Undergraduate Study Program of the Department fully complies with the model quality standards of the Hellenic Quality Assurance and Accreditation Agency and the Quality Assurance Standards of the European Higher Education Area (ESG).

## Postgraduate Programs Evaluation

**MSc in Management Science and Technology** full time program ranked 17th in the field of "E-Business and Digital Marketing in Western Europe", according to the international ranking body Eduniversal Best Masters Rankings for 2021.

**MSc in Business Analytics** ranked 78th in the world according to the annual ranking of Universities by the international rating agency Quacquarelli Symonds (QS). The full-time program also ranked 12th in the world in the field of "Business Intelligence & Strategy", according to the authoritative international ranking body Eduniversal Best Masters Rankings for 2021, while, according to the same body, the part-time program ranked 14th position in Western Europe in the scientific field "Data Analytics".

**MBA International**, according to the annual ranking of Universities by the international rating agency Quacquarelli Symonds (QS), was ranked between 111-120 worldwide, and 36th in Europe. It also emerged in the highest ranking among the respective Greek postgraduate programs. It also ranked 8th in the Eduniversal Best Masters Rankings for 2021 in the "MBA Part Time" category, while in the same ranking it ranked 12th in the "International Management in Western Europe" category for the geographical area of Western Europe.

**MBA International** was certified in 2021 for the fifth consecutive time by the International Association of MBAs (AMBA). The AMBA organization certifies MBA, DBA and MBM programs worldwide, taking into account specific criteria, in order to provide the programs that certify international credibility. It is worth noting that this certification is enjoyed by only 2% of the Schools of Management in over 75 countries worldwide.

The **Executive MBA** program was re-accredited by the Association of MBAs (AMBA), the international independent authority for postgraduate training in business administration. After an extensive evaluation, the Executive MBA received the certification as confirmation that the teaching, the curriculum, the quality of the teaching and research staff and the other services offered to the students of the program meet the highest criteria set by the AMBA. The assessment also took into account the views of students, graduates and employers.

**Executive MBA**, according to the annual ranking of Universities by the international rating agency Quacquarelli Symonds (QS), ranked 131-140 worldwide, while it also ranked 26th in Europe, according to the international Eduniversal Masters Rankings for 2021.

**Msc in Human Resource Management** was evaluated by the Society for Human Resource Management (SHRM) - the largest professional body in Human Resource Management worldwide - and received recognition that the content of the program and courses which is offered, is fully harmonized with the guidelines of the institution for education in HRM (SHRM's HR Curriculum Guidebook and Templates).

**MSc in Human Resource Management** took the 8th place in the annual ranking of the Eduniversal Best Masters Rankings for 2021, in the field "Human Resources Management in Western Europe", among the respective Postgraduate Programs in Western Europe.

**MA in Heritage Management** ranked 6th in the world in the field of Cultural Management / Creative Industries Management according to the international ranking body [Eduniversal Masters Rankings](#) for 2021.

**MSc in Public Policy and Management** ranked 8th in Europe according to the international ranking body [Eduniversal Masters Rankings](#) for 2021 in the field of Public Administration / Management.

## 2. BRIEF DESCRIPTION OF COURSES

### 2.1. 1st SEMESTER

**Mathematics I**

The objective of the course is to teach the basic mathematical concepts of differential and integral calculus with emphasis on the utilization of mathematics in the development of models that serve applications in economics and management science. Furthermore, the students use the EXCEL, MATHEMATICA, and MATLAB in applications of differential and integral calculus. The course material is designed as to develop the mathematical background needed in other courses of the curriculum.

The course material can be organised in four basic parts:

    I.   Introduction – Basic concepts: Sets, Functions, Series, Limits, Elementary analytical geometry.

    II. Differential Calculus of Univariate and Multivariate Functions

    III. Integral Calculus

    IV. Applications of Mathematics in Economics and Management Science

**Introduction to Management**

Management as a field of scientific inquiry, as well as every day practice, is particularly important because it is critically associated with the efficient and effective functioning of firms and organizations. As such the main objective of this course is to introduce students to the basic Management principles and functions. Topics include: (a) management fundamentals, (b) analysis of internal and external environment, (c) planning and decision making, (d) organizational architecture, (e) and leadership and human capital.

- Section 1: Fundamental functions of management and managers' roles. The evolution of management theory.

- Section 2: The organizational and global environment; ethics and social responsibility Managers as decision makers and strategists.

- Section 3: Analysis of the manager role as a decision-making entity and the design operation.

- Section 4: Managing organizational structure; organizational control and culture.

- Section 5: Human resources management and leadership.

**Introduction to Computer Science**

Throughout the course the students acquire basic knowledge regarding the principles of computer science, the principles of computer operation and their programming. The learning objectives of the course are:

- To understand the basic principles of Computer Science

- To familiarize students with basic concepts regarding information technologies, computing systems, software/hardware components and communication networks

- To familiarize students with the basic programming skills in the Java programming language.

- To introduce students to the nature of computer problems.

The course contents are: IT Principles, Computer Architecture, Software, Algorithms, Procedural Programming Principles, Programming language Java, Operating Systems, Computer Networks, Artificial Intelligence, Security.


**Introduction to Marketing**

The course "Introduction to Marketing" introduces the student to the basic concepts and principles of the Marketing science contributing to the acquisition of useful knowledge through the theoretical review of the topic and the analytical presentation of the relevant practical issues, giving particular emphasis in the connection of theory with practice. Indicatively, the course includes the modules of shopper behaviour (business and consumer), Marketing research, product, distribution, pricing and integrated Marketing communications strategies, Marketing environment, segmentation, targeting and positioning, etc. Finally, in the context of the course it is attempted to introduce students to the Marketing scientific research by presenting and discussing its contribution both to theoretical and practical level.


**Accounting I**

The course introduces the basic principles of Accounting, its fundamental concepts and its basic tools, which are essential for the study, understanding and mapping of economic events within the accounting system. It presents the methodology of General Accounting and the usefulness of the double-entry system, the completion of the accounting cycle as well as the process of preparing the financial statements, which are tools both for the sound financial presentation of the data and for future decisions of the enterprises.

The purpose of the course "Accounting I" is for the student to understand the usefulness of accounting, the concepts that govern it, and to familiarize himself with the tools it uses. Emphasis is placed on issues of accounting theory and practice for learning the processes of the accounting cycle, the purpose of the accounts and their usefulness, the preparation of the basic financial statements - the income statement, the balance sheet and the cash flow statement, as well as their importance and interpretation.

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

- Understand basic Accounting principles and practices
- Record the financial events based on the above accounting principles
- Implement the full accounting circuitry
- Prepare the required financial statements
- Present basic interpretations of financial results

## 2.2. 2nd SEMESTER

**Mathematics II**

The goal of the course is to teach students advanced topics in mathematics for Business & Economics. The course is designed to provide both intuition and deep understanding of concepts in Linear Algebra, Calculus of multiple variable functions Implicit functions, Differential Equations, Difference Equations and Constrained Optimization Methods for multiple variable functions. The first semester mathematics on Differential and Integral Calculus is a prerequisite. The course helps students familiarize real life applications that illustrate the use of mathematical concepts in business economics and technology as well as in decision sciences. During the course, students are encouraged to computer usage via modern computational platforms such as MATHEMATICA, MATLAB, and EXCEL. Specific tutorials for the Mathematica are offered during the course.

Vectors, Matrices and Linear Systems, Dimension, Rank and Linear Transformations, The Vector Space Rn, Determinants, Eigenvalues and Eigenvectors, Orthogonality, Change Basis, Solving Large Linear Systems, Implicit Functions, the Implicit Function Theorem, Introduction to Differential Equations, Modeling with Differential Equations, First Order Differential Equations, Higher Order Differential Equations, Solutions of Second Order Linear Homogeneous Differential Equations with Constant Coefficients, Solutions of Second Order Linear Nonhomogeneous Differential Equations with Constant Coefficients, Applications of Higher Order Differential Equations. Difference Equations, Calculus of Functions with Multiple Variables, Partial Derivatives, Differentiability, Extreme Values of Functions, Optimization Functions Constrained Optimization, the Method of Lagrange Multipliers.

**Quantitative Methods in Economics and Business I**

The objectives of this course is to introduce the students to the fundamental concepts of probability, as applied to modeling business, economics and information technology issues, including a gentle introduction to simulation. The course will serve as an introduction to concepts that will further be elaborated in more specialized courses such as stochastic models, simulation of processes, finance and econometrics etc.

The Course contents are:

- Discrete probability, discrete random variables, distributions, moments. Examples and applications in fundamental discrete distributions (Bernoulli, Poisson, Geometric etc).

- Continuous probability, continuous random variables, distribution, density, moments. Examples and application of fundamental continuous random variables (uniform, exponential, normal etc).

- Basis concepts of simulation of discrete and continuous random variables, calculation of moments, Monte-Carlo method. Applications in models of economics and management.

- Introduction to asymptotic theory, central limit theorem and applications.

**Programming I**

The course introduces students to the fundamental concepts of programming using the Java programming language. At the first part of the course, students are familiarized with the basics of programming (development of algorithms, Object-oriented design) applied through Java programming. At the second part of the course, the most significant aspects of the Java language are analyzed (classes, methods, variables, tables, control statements, inheritance) in order to provide students the ability to develop their own Java programs.

The expected learning outcome is to enable students to design object-oriented programs and develop programming skills using the Java language through a number of lab exercises and personal assignments. The scalable learning method employed (from small program segments to larger – real life – programs) is expected to exercise students in the analytical programming thinking and provide them with the necessary knowledge to build their own programs in a systematic way.

The course contents are:

- Fundamental elements of programming languages

- Object-Oriented modeling

- the Java programming language

- variables

- input and output

- comparison operators

- logic operators

- conditional operators

- programming with objects, classes and methods

- arrays

- exceptions

- inheritancead

**Accounting II**

The lesson is the continuation of the Accounting I course. It highlights the importance of analyzing accounting information and the role played by such information, as reflected in the accounting and

financial statements, for making business decisions. Proper analysis and interpretation of accounting statements is an important tool for external and internal users to make rational future economic decisions.

The purpose of the course "Accounting II" is for the student to understand the usefulness of financial statements analysis and the importance of the proper processing of the multitude and variety of financial information and data so that optimal decisions can be made. Particular importance is given to students being able to interpret the qualitative characteristics of the quantitative data they derive from the accounting statements so that they can be used for future decisions.

Upon completion of the course the student is able to:

- Understand the results of the financial statements
- Compile the information required for decision making
- Distinguish problems that arise through the study of accounting statements
- Make proposals for administrative and strategic choices
- Develop analytical and critical thinking skills in administration and management


**Introduction to Economic Theory**

Students are introduced to the basic concepts and tools of microeconomic and macroeconomic analysis. 40% of the curriculum refers to microeconomics and 60% to macroeconomic analysis.

Specifically, in **microeconomic analysis**, the following topics are covered:

1. Basic economic concepts. Demand and supply of goods. The market system and the formation of prices. Elasticity of demand and supply.

2. Consumer choices and the theory of demand for goods. Producer choices and bid decisions.

3. Theory of production, cost and supply of goods in the short and long term. Forms of market and social well-being. Perfect competition, monopoly, oligopoly and monopoly competition.

4. Competition, coordination and balance. The market mechanism and the logic of regulatory intervention by the state. Market imperfections and failures.

In **macroeconomic analysis** the following thematic sections are covered:

1. The revenue stream and the system of national accounts categories. Product and total demand. Determination of income and total employment.

2. Fiscal policy and multipliers.

3. Money, banks and monetary policy.

4. Inflation, unemployment and economic fluctuations.

5. International trade, international economy and economic policy. Exchange rates, balance of payments and competitiveness. Economic development and growth..

6. Stabilization policy (fiscal and monetary). Total supply, total demand and the concept of macroeconomic equilibrium. Determination of prices and wages and adaptation to short-term disorders (IS-LM model) and long-term (MDS-AS model).

7. Economic dimensions of European integration. The Single Market. Economic and Monetary Union. European Central Bank, monetary policy framework. The effectiveness of monetary and fiscal policy in a single currency area.

   Financial crisis in Greece and the Eurozone. Balance of government budget, primary result and sustainability of public debt.


**Contemporary Issues & Trends in Management & Technology**

The course has a double aim: 1) to introduce basic concepts related to business functions and familiarize students with contemporary issues and trends on management and technology and 2) to familiarize students with the methodologies of research projects.

The course material includes the following thematic areas:

- Enterprise

- Entrepreneur

- Entrepreneurship

- Innovation

- New product development

- Marketing – digital marketing

- Informatics and information systems

- Introduction to e-commerce

- Operations management

- Supply chain management

- Management of human resources

- Flexible employment

- International business

- Enterprise and the natural environment

- Competitiveness

- Research methodologies

## 2.3. 3rd SEMESTER

### Decision Making

Decision-Making is one of the most important functions of management. Today's business environment is characterized by high competition, constant changes, extensive globalization, large availability of data and information, and the huge penetration of information and telecommunications technology. In this environment, decision making is increasingly based on the use and analysis of data, through the development of "models", and the use of user-friendly, PC-based computer packages.

This is what this course is all about. The emphasis of the course will be on understanding and formulating complex problems, as they appear in today's business environment, developing the appropriate decision models, and using them for effective decision making.

The course introduces the student to the methodology of decision making, as well as to the major models used today. The three major categories of models are covered: Linear and Integer Programming, Decision Analysis, and Simulation. In each unit, the student is exposed to a number of applications, and has the opportunity to apply his/her knowledge to a number of problems and case studies. In addition to developing models, the student is exposed to a number of computer packages, most of them based on Excel, to use in order to solve the problems.

### Quantitative Methods in Economics & Business II

The objectives of this course is to introduce the students to the basic principles of statistical inference and modelling in order to be able to use them in problems of management science. A part of the course will be concerned with an introduction to the essential concepts of statistics so that the students may subsequently be taught and understand regression methodology, which is widely used in economics and management.

The course contents include:

- Statistical estimation: Least Squares, maximum likelihood estimation, Bayesian inference
- Hypothesis testing: basic concepts and examples
- Simple linear regression. Applications of the simple linear modeling problems from economics and management science
- Analysis of variance: basic principles and applications via software.
- Multiple linear regression: estimation, multicollinearity issues, applications with statistical software

### Organizational Behavior and Leadership

The course includes the study of the fundamental knowledge on the description, explanation and management of individual and team behaviors found in organizations. It aims to develop the ability to manage people as individuals and as teams. Through the course students can:

- Understand the personality, the attitudes and behaviors of people in the working environment.

- Obtain a conceptual and theoretical background on leadership

- Be able to motivate their colleagues and partners

- Be able to develop effective teams

- Be able to communicate successfully

- Understand better the corporate culture of their organization

The course contents are:

- Introduction to Organisational Behaviour

- Work Attitudes and Behaviours

- Leadership

- Motivation

- Group Dynamics

- Organisational Culture

- Management of Change

- Empowerment

- Learning Organisations

**Database Management Systems**

Databases began as a simple application in early 70s and grew to one of the most important fields in computer industry, touching hundreds of IT applications. This outcome was somehow expected, since the focus of database research is the description, storage and usage of data. To describe a database application we need a data model, such as the entity-relationship or the relational model. To retrieve and make use of the stored data, we need a generic query language, such as SQL. Finally, there are numerous ways to store data, depending on how this will be used. The goal of this course is to educate students on how to design properly, build efficiently and use intelligently a database. Furthermore, it should make apparent the various trade-offs that exist in designing, building and using such an application.

The course contents include:

- Introduction: Purpose, data models, database languages, users, transactions, architecture.

- Entity-Relationship Model: Entities, relationships, attributes, keys, mapping cardinalities, weak entities, E-R diagrams, mapping to tables, examples.

- Relational Model: Relations, relational schema, relational algebra.

- The SQL Language: Basic structure, nested subqueries, aggregation, views, update, procedural and embedded SQL, triggers.

- Relational Design: Integrity constraints, functional dependencies, decomposition, normalization.

- Storing and Indexing: File organization, indexing, hashing, trees.
- Special Topics: Data warehousing, OLAP, data mining, data streams, OO DBs.

**Programming II**

At the end of this course students should be able to:

- have a basic knowledge of the methods and programming techniques used for implementing information systems
- design and build moderately complex applications
- use ready-made libraries and data structures
- use design patterns to structure their code
- process complex data structures and sources
- evaluate alternative technologies and information system evaluation strategies

The course contents are:

- Development environments and languages
- Compilers and interpreters
- Programming with objects
- Code style
- Building classes
- Inheritance
- Development of large systems: exceptions, assertions, interfaces, abstract patterns, packages
- Generalizations and threads
- Data structures: strings, iterators, vectors, stacks, and maps
- Structuring data with XML
- File handling
- Development of graphical applications
- String processing with regular expressions
- Interfacing with internet applications
- Handling data in relational databases

## 2.4. 4th SEMESTER

**Human Resource Management**

The course aims to develop the conceptual and theoretical background of today's Human Resource Management (HRM).

The course's main objectives are:

- Understanding the importance of Human Resources as the strategic factor of sustaining business success.
- Understanding the main issues of HRM in today's complex and dynamic environment.
- Learning the concepts, the theories and the tools to deal with all-important HRM issues.

The course contents are:

- Introduction to HRM
- Job Analysis
- Human Resource Management Planning
- Recruiting-Selection
- Performance Appraisal
- Reward System and motivation
- Training and Development
- Internal communication
- Change management
- Organizational learning and Learning Organization
- Managing culture

**Mathematical Programming**

This course examines the theory and the algorithms of Mathematical Programming and their relations to other areas (e.g., Game Theory). In particular, the course includes the Linear Programming problem, Duality Theory, basic algorithms for Linear Programming, introductory concepts of Non-Linear Programming and Integer Programming, problem formulation in Mathematical Programming, Dynamic Programming and Linear Programming's relation with Game Theory. The expected outcome is the solid understanding of all the above and, in addition, the applications of Mathematical Programming arising from real-life settings. More specific outcomes include the in-depth knowledge of mathematical structures and properties of classes of problems, the use of algorithms but also the design of variants for special cases and, last, the modeling and solving of relevant practical problems.

The purpose of this course is the in-depth understanding of the theory and applications of Mathematical Programming. More specific learning outcomes include:

i. The understanding of mathematical structure and properties of fundamental problem classes (e.g., linear, non-linear and integer programming, dynamic programming).

ii. The use of Mathematical Programming algorithms for problem solving but also the design of their variants for special problem cases.

iii. The formulation and solving of problems arising from practical, real-life settings.

The course material includes the following topics:

- The Simplex Method: description, geometric interpretation and special cases

- Sensitivity analysis and economic meaning

- The Karush-Kuhn-Tucker conditions, description and proof

- Duality Theory

- Introduction to Non-Linear Programming

- The transportation problem and the Network Simplex Algorithm

- Model building and formulation, applications and case-studies

- Integer Programming, modeling and solution methods

- Linear Programming and Game Theory

- Dynamic Programming: formulations, solution approach and applications


**Analysis & Modeling of Business Processes and Systems**

The starting point of the course is the need to recognize and understand problems in managing information and processes in an organization's environment. The course examines methods for the systematic study and formatting of such problems in order to be supported by information systems. The course focuses on the identification, modeling and documentation of requirements of various users and stakeholders that are affected and affect the development of information systems. It also examines the transformation of requirements in information system operation specifications, system design, and the development and integration plan of the organization that will use it. The course focuses on the role of human factor in the development of information systems. The practical part of the course deals with analysis and design using tools such as the SSM, the UML modeling language, and the HTML web design language. At the end of the course, the students are able to understand the process of developing information systems and have the basic theoretical and practical knowledge required for its effective management.

The course material includes the following thematic areas:

1. Organizational analysis and Information Systems

2. Work systems: conceptual framework, elements of, and 5 analysis perspectives

3. Event driven business process modelling

4. Work systems analysis perspectives: architecture, performance, infrastructures, context, and risk.

5. Applying business analysis techniques to real-life settings

6. Business process management life-cycle.

**Algorithms and Data Structures**

The course aims to present students with the basic principles and techniques of algorithms, and data structures, focusing on real problems.

Students:

- Understand how algorithms and data structures are used in solving real world problems

- Consider trade-offs in solving computing problems

- Come in contact with cryptographic principles governing all digital communications and transactions

- Learn techniques that are used in solving problems involving big data, in different application areas.

Course contents are:

- Algorithms and Complexity

- Data Structures

- Graphs and Networks

- Cryptography


**Financial Management**

The objective of the course is to introduce the student of management science to the fundamentals of financial management. To this end, the course revolves around the functions of the financial system, the concept of time value of money, corporate investment and financing decisions, investment appraisal criteria and security pricing. Students get a chance to test their understanding of the concepts and tools covered in lectures via either an elective group coursework or a real business case study.

The course material includes the following thematic areas:

- The financial system

- Time value of money

- Investment evaluation criteria

- Asset pricing

- Financing decisions and the efficiency of capital markets


**2.5. 5th SEMESTER**

**Project Management**

Managing projects constitutes a major management operation in any contemporary company or organization. This course deals with the techniques, methods, and tools used for planning, controlling and assessing projects. After completing this course the students are able to:

- Understand methods and techniques related to project selection, organization, planning, scheduling, control, and evaluation
- Select and evaluate projects
- Schedule optimally the project evolution
- Monitor and manage a project
- Implement processes for project control

The course includes the following sections:

- Introduction to Project Management: Project life cycle, Total Quality Management in project management,
- Project Selection and Evaluation: Cost-benefit analysis, Cost-effectiveness analysis, Multicriteria evaluation,
- Project Scheduling: Definition, objectives, and constraints for project development, identification of activities, estimation of the duration and the resources required for the realization of the activities, construction of project network,
- Methods for Project Scheduling: Methods for Project Scheduling (Critical Path Method, Programme Evaluation Review Technique),
- Project Cost and Resource Management: Cost estimation, time-cost trade-off analysis, resource management and allocation, Programme Management,
- Project Control: Techniques for project control.


**Optimization Methods in Management Science**

Management Science is a key factor in the implementation of management. It deals with the design and implementation of an organization's decisions and strategy, taking into account computational models and decision-making methodologies, modern IT and communications technology, and the business environment.

The aim of the course is to consolidate the Management Science from the students through:

- case-studies, which highlight the modern rational approach of this science to the complex operational and strategic problems of today's companies
- the solution of realistic size and computationally complex problems

The problems and case studies examined within the course cover a wide range of activities of modern companies such as transport and logistics, supply chain, telecommunications, production and services, administration and resource planning.

On completion of this course, students should be able to:

- apply the appropriate analytical methods to define the components or factors affecting the problems under consideration and to identify the strategic and operational objectives and the constraints governing them

- analyze and design optimization methods for solving management science applications.

The course material includes the following thematic areas:

- Computational complexity and management science applications
- Large scale optimization and applications
- Approximation algorithms and applications
- Construction algorithms and applications
- Local search and neighborhood structures
- Iterative improvement algorithms
- Greedy Randomized Adaptive Search Procedures and applications
- Variable Neighborhood Search and Large Neighborhood Search
- Simulated Annealing and applications

**Management and Information Technology**

The learning outcomes of the course are:

- To comprehend the basic dimensions of the use of Information and Communications Technologies (ICT) in organizations and the main issues that is connected with their effective exploitation.
- To acquire the necessary conceptual background in order to comprehend the issues that the managers deal with, regarding ICTs.
- To get to know the main functions of the appropriate management of information systems (IS) in organizations and the fundamental theoretical and practical models that lead to the management of this operation.
- To comprehend how ICTs affect the organisational structure of businesses and their relations with the business environment.

The course contents are::

- The importance of information technology for organisations with issues such as: managing information systems, strategic information systems, business process re-engineering and informational technology, the role of informational technology in the management of change, harmonisation of business and IT strategy.
- The use and exploitation of informational systems with subjects as: support management decisions, support intra-organisational procedures, managing data and knowledge, integration of processes, enterprise resource planning (ERP), electronic commerce.
- Business Transformation and the role of information systems with issues as: process, the transition from traditional to electronic business, business process reengineering (BPR), the impact of IT on competition and cooperation.

**Work & Organizational Psychology**

Organizational Psychology is an area of applied psychology. It investigates employees' interaction at workplace using social sciences' theories and research designs, exploring simultaneously relationships amongst employees. The course is designed to offer an introduction to the field of work and organizational psychology in relations to courses such as Human Resource Management and Organizational Behaviour and Leadership. When completing this course students will be able to use the models, constructs and practical implications of organizational psychology in order to perform more effectively at work in benefit of themselves and their organizations.

The course is based on the analysis of the basic applications of organizational psychology. The sections that are discussed are the following: Psychological assessment at work and individual differences (Cognitive ability, personality and emotional intelligence), attitudes at work, occupational stress and burnout, work satisfaction, career management and development and teamwork, etc.

The content of the course includes the following main thematic areas:

- Introduction - Basic Concepts: The beginning and development of Organizational Psychology - Video view (Documentary)
- Psychometric assessment in Organizational Psychology - Psychology of Individual Differences - Intelligence - Cognitive Skills Questionnaire - Video view (Documentary)
- Psychology of individual differences - Personality - Personality questionnaire
- Psychology of individual differences - Emotional Intelligence
- Learning - Performance of behavioral causes
- Prejudices, stereotypes and perception - Video view (Documentary)
- Attitudes, professional satisfaction and positive work behaviors
- Integration, socialization in the organization and Psychological contract
- Work Performance and negative work attitudes - Video view (Documentary)
- Occupational stress and burnout - Occupational stress questionnaire to be completed in the class - Video view (Documentary)
- Dynamics and group processes at work - Teamwork Questionnaire Types


**Information Systems Implementation and Architecture**

The aim of this course is to provide students with a complete view of information systems development, in general, and web applications in particular, as well as the technologies used in this context and the applications that can be supported. During the course, practical and theoretical subjects will be covered concerning software design, architectural design, development and control, contemporary software development environments, tools and Internet technologies. Emphasis will be placed on layered architecture design, application design, implementation and testing. At the same time, this course aims to complement and exploit the knowledge students have already acquired in previous courses, such as

databases, systems analysis and design, programming etc., in order to support the design and development of a full functional web-site, which constitutes the practical part of the course.

By attending this course, students are expected to:

- Acquire a theoretical and practical background of application architecture and design with emphasis on web applications

- Learn how to design, develop, and test fully functional applications from scratch

- Acquire knowledge regarding web programming and Internet technologies

- Get a contemporary view of software applications development and web technologies

- Comprehend information systems architectures and impact on managerial decisions

Course contents are:

- Introduction in Basic Terms

- High Level System Design

- Detailed System Design

- Implementation and Testing

- Web Application Frameworks and Technologies

## 2.6. 6th SEMESTER

**Business Strategy**

The Course introduces students to issues of Business Strategy while providing them with skills regarding the application of concepts and techniques. It examines issues along the whole spectrum from strategy formulation to strategy implementation. It refers to theories and practice, using examples from real enterprises and cases presentation.

The course includes four parts referring to:

- The concept of strategy: Strategic fit, strategic stretch. Intended and realised strategies. Strategy as design versus emergent strategy.

- Strategic analysis: Framework, methods and tools of environment analysis. Analyzing resources and capabilities. Sources of competitive advantage.

- Strategic choices: Generating alternative strategic choices for business development. Strategic alliances and partnerships. Acquisitions. Evaluation of alternative strategies.

- Strategy implementation: Transformation of strategy into action plans. Aligning tactics, structure, systems, skills, culture, management style. Planning, processes and resource allocation. Strategic change.

_**Stream I: Operations Research & Business Analytics**_

**Topics in Operations Research and Decision Systems**

This course introduces advanced optimization tools and techniques with the main emphasis being on the application of computational intelligence algorithms to different problems and cases which arise in business and industry, such as vehicle routing and scheduling problems, packing problems, facility location and layout problems, project scheduling with resource constraints problems, workforce and manpower scheduling problems, timetabling problems, machine scheduling problems, port logistics problems, telecom problems, waste management problems, health care problems, maritime and shipping problems.

On completion of this course, students should be able to broaden their exposure to computational methodologies, analyze and design effective computational intelligence algorithms for complex business problems, provide examples and cases of how the computational intelligence algorithms can be used to solve real-life problems.

The course material includes the following thematic areas:

- Threshold accepting algorithms

- Tabu search algorithms

- Swarm Intelligence and Ant colony optimization

- Evolutionary computation and genetic algorithms

- Scatter search and path relinking

- Decision support systems and computational intelligence algorithms

- Examples and real life applications


**Production and Operations Management**

The goal of the course is to introduce the student to the design, analysis, reengineering, optimization and functional control of modern companies and addresses the key elements that forge the effective management of an organization's limited resources. The same principles hold whether the organization manufactures a product or provides a service, operates in the public or private sector, or is profit or non-profit oriented. Through the course, the student will understand the organizational structure and the various components, sub-systems and functions of a Production or Service Provisioning System, and will gain significant knowledge on the problems arising during their design and operation, as well as on the problem-solving methods through analytical and computational techniques. The topics of the course cover most complex and interrelated business processes inherent in the systems operation, e.g., product and process design, operations planning and scheduling, facility location and layout, etc.

The course aims at providing a comprehensive view of most managerial techniques that are used by today's complex enterprises in solving their difficult and intrinsic operational problems.

The course covers the following thematic areas:

- Introduction – POM as a system

- Forecasting

- Assembly lines and cellular systems

- Facility Location – The Transportation problem

- Facility Layout

- Inventory Management basic models

- ROP models with demand variability

- Production Scheduling

- Lean systems


### Stream II: Information Systems and Electronic Business

**Digital Content Management and Human-Computer Interaction**

The course introduces students to the basic concepts of Human-Computer Interaction, explaining fundamental concepts such the role of user's mental model of interaction, usability design principles, evaluation methods and techniques. Going beyond the fundamentals, at the second part of the course, advanced methods for improving user experience are presented in detail, including analyzing web site data (using google analytics), recommendation algorithms, exploiting social media and SEO techniques to improve site's effectiveness.

The expected learning outcomes include:

- Understanding of the fundamental principles of Human – Computer Interaction and the related concepts (e.g. interactivity)

- Development of skills that will enable the design and development of usable interactive systems

- Understanding of content architecture principles and practical tools

- Understanding and development implementation skills for the evaluation of interactive systems in terms of usability

- Design and development of value added services such as intelligent interfaces and personalization services

- Familiarization with the use of social media, Search Engine Optimization techniques as well as data analysis techniques (Google analytics, A/B testing)

Course contents are:

*Section 1: Fundamentals of Human-Computer Interaction*

- Basic concepts. The human as information processor.

- Interaction/interactivity, interaction styles, direct manipulation

*Section 2: Interface evaluation methods*

- Design rules and principles

- Heuristic evaluation, cognitive walkthrough, experimental evaluation

*Section 3: Analysis, design, and implementation*

- Requirements analysis
- Content organization, information architecture
- Content Management Systems
- Prototype development
- Implementation in desktop, web, mobile platforms

*Section 4: Advanced methods of digital content exploitation*

- Google Analytics, Conversion rate Optimization, Google Experiments
- Persuasion and Influence Strategies
- SEO
- Recommender and Social recommender Systems

## Analysis and Modeling of Business Processes and Systems

The objective of the course is to introduce basic concepts and techniques related to business analysis of IT enabled work systems. The students will comprehend how different types of business processes and technologies, within a specific human, work and organisational context can be analysed in order to identify and implement improvements and innovations. Emphasis is given on techniques for the analysis of structures, performance, infrastructures and risk in organisational and societal settings empowered by technology. Further, the student will be introduced to techniques and tools for business process modelling and evaluation and will apply them to test cases in lab sessions. Students will also learn how to conduct a business process analysis study and will be asked to apply these skill in real life case setting.

The course material includes the following thematic areas:

- Organizational analysis and Information Systems
- Work systems: conceptual framework, elements of, and 5 analysis perspectives
- Event driven business process modelling
- Work systems analysis perspectives: architecture, performance, infrastructures, context, and risk.
- Applying business analysis techniques to real-life settings
- Business process management life-cycle

## Electronic Commerce and Internet Applications

The growth of the Internet and electronic commerce over the last decade has radically changed the communication landscape between business and consumers, business partners, government and citizens etc. Moreover, new developments around social networking and the interaction through emerging communication channels, such as mobile, have created a new landscape for innovation and

entrepreneurship. The objective of this course is to develop the students' theoretical and technical background in order for them to understand the possibilities and limitations of the new technologies and business models and be in the position to exploit the new business opportunities that open up in this area. Different e-business applications and case studies are examined from both a business and technical perspective. Topics discussed include, among others, the required technical infrastructure, critical aspects of online promotion and selling, the interconnection of systems, and in general various practical topics associated to the business exploitation and implementation of e-business applications. Students also have the possibility to acquire practical knowledge and skills working on the implementation of an online store using open source software platforms and optionally on the development of mobile apps and the interconnection of systems.

By following this course, students are able to:

- Acquire the necessary conceptual and theoretical background through an interdisciplinary approach.

- Recognize the opportunities for developing new services for customers, citizens, businesses etc. and exploit new technologies to interact with them through social networking and emerging communication channels.

- Understand the critical factors and the benefits associated with the effective management of e-commerce initiatives and evaluate a given strategy or e-commerce business plan • Acquire the skills to help implement e-commerce solutions and deal effectively with the various practical and technical issues.

- Understand the technological issues associated with the development of e-commerce, but also learn how to use open source platforms for developing online electronic stores.

- Get informed about recent developments and trends around the e-commerce globally, from a business and academic perspective.

Course contents are:

- Introduction and Basic Concepts
- Development of on-line store
- B2B e commerce issues
- Other subjects


### *Stream III: Strategy, Entrepreneurship and Human Resources*

**Human Resource Management in Digital Era**

Aim of this course is to transfer in practice the theoretical knowledge acquired in previous, similar courses (e.g. Organizational Behavior, Work & Organizational Psychology, Human Resources Management). It will introduce the students who have chosen the perspective stream into the practical applications of the main concepts providing them with the necessary tools to work in a Human Resources department. Upon

completion, the students will have acquired a full knowledge of the functions and daily operations of the Human Resources Department.

The Course contents are:

- Introduction
- Strategic Human Resource Management
- Recruitment and Selection
- Performance Management
- Training and Development
-  Motivation and Rewards
- International Human Resources Management
- Career and Career Development
- Organizational Change and resistance to change

## Product Design and Development

This course will equip the students with basic understanding and fundamental knowledge about product design, new product development, and the management and strategic importance of these processes. The emphasis is on developing practical skills related to product management from the perspectives of industrial design and product engineering. The course has an interdisciplinary base, which resides on innovation and then integrates concepts and methods of aesthetics, semantics, design functionality, technology management, user-led innovation, manufacturing, environmental sustainability, ergonomics, organization and strategy. The aim is to propose a balanced blend of creative, technical and managerial aspects of the subject matter.

The combination of pedagogical methods - lectures, exercises, case studies, visits and teamwork - cultivates the ability of independent student learning to understand the complexity of product design and development.

In particular, the course aims to:

- Offer a comprehensive understanding of product design and development, combining creative thinking, sensory awareness, technological logic, customer / market understanding and strategic thinking,
- Develop understanding, management and planning skills,
- Familiarize students with methods, tools and software to design and manage new product development,
- Instill awareness of the importance of designing products for innovation in general and in particular with regard to man-centered design, sustainable and eco-design and open innovation models,

- Develop skills to analyze technology, industrialization and market-related product design and development.

**International Business Management**

The aim of the course is for students to understand the international business and its operation in the international market. The basic principles of Business Administration remain the same when an enterprise is internationalized but needs to be studied in the new external environment markets. Foreign countries are different and so the problems that management can face with the internationalization of the company are likely to be more complex. The management of an internationalized business should investigate to what extent it should respond - adapt its resources and capabilities, and strategies for international markets as well as to what extent it will take advantage of the opportunities and opportunities that exist in its country-based economy internationalization. Also, transactions at international level involve risk since they involve currency conversions in different national currencies. Consequently, the overall objective of the course is to bring the content of International Businesses closer to the entrepreneur / business team in a wider context of decisions in the internationalized company on the international and domestic markets. Teaching and discussion is based on activities and examples of Greek and international business.

## *Stream IV: Operations and Supply Chain Management*
**Supply Chain Management**

Competitiveness constitutes a key success factor for any contemporary business activity. However sustaining and enhancing business competitiveness involves producing and offering the right product, at the right time, the right place and at the right price and conditions. Supply Chain Management contributes substantially to this goal through managing the integrated process of delivering products and/or services to markets. This course presents the major operations involved in a supply chain, and elaborates on the methods, techniques and tools used for managing the supply chain for products and services.

After completing this course the students are able to:

- understand concepts and methods regarding the planning, design and operation of Supply Chains,
- understand the strategic role of Supply Chain Management in the Global Business Environment.
- understand the Emerging Supply Chain Management (SCM) trends in the Global Business Environment, the modeling of SCM decisions, and the assessment of Supply Chain performance
- understand the role of Information and Communication Technologies in Supply Chain Management
- understand, analyze, and plan the primary and secondary (complementary) logistics processes
- evaluate the effectiveness of logistical processes of a company / organization.

The course contents cover the following sections:

- Current trends in Supply Chain Management, e-Logistics,
- Basic and Complementary functions of Logistics, Logistics for the wider service industry,
- Product / service characteristics and requirements for organizing and designing the Supply Chain,
- The order processing system and the customer service,
- Orders management,
- Natural product distribution, Product transportation and distribution processes,
- Location of warehouses and distribution centers,
- Logistics Management Information Systems, applications of telematics in Supply Chain Management
- 3rd party Logistics Providers (3PL's),
- Evaluation of logistical operations.


**Quality Management**

Product and service quality are very important as they not only determine customer and user satisfaction, but also the financial performance and even the survival of organizations. Quality can also be a differentiator in the marketplace, a key to optimized resource utilization and a factor that contributes to reducing the cost of production or service provision.

Quality Management departures from a clear strategy, requires an effective organizational structure, an HR policy that recognizes the importance of the contribution of all, use of specific tools an methods, and a managerial 'discipline' that must immerse throughout the whole supply chain. Professional Quality Management is today as important as effective financial management, marketing, HRM or any other area of management.

The course introduces students to the basic principles of a customer-oriented business environment where total quality and continuous improvement are central preoccupations irrespective of the kind of organization or the level within that organizations.

The course material includes the following thematic areas:

- Definitions and fundamentals of Quality and Quality Management
- Statistical Process Control SPC: Measuring quality – where and how? Origins and foundations of SPC, Quality Charts and Process Capability
- Application of Quality Tools.
- Overview of Quality Standards and Excellence Frameworks. ISO 9001 and 14000, EFQM. Quality Procedures.
- Strategy, organization and HRM in relation to Quality Management.

**Production and Operations Management**

The goal of the course is to introduce the student to the design, analysis, reengineering, optimization and functional control of modern companies and addresses the key elements that forge the effective management of an organization's limited resources. The same principles hold whether the organization manufactures a product or provides a service, operates in the public or private sector, or is profit or non-profit oriented. Through the course, the student will understand the organizational structure and the various components, sub-systems and functions of a Production or Service Provisioning System, and will gain significant knowledge on the problems arising during their design and operation, as well as on the problem-solving methods through analytical and computational techniques. The topics of the course cover most complex and interrelated business processes inherent in the systems operation, e.g., product and process design, operations planning and scheduling, facility location and layout, etc.

The course aims at providing a comprehensive view of most managerial techniques that are used by today's complex enterprises in solving their difficult and intrinsic operational problems.

The course covers the following thematic areas:

- Introduction – POM as a system
- Forecasting
- Assembly lines and cellular systems
- Facility Location – The Transportation problem
- Facility Layout
- Inventory Management basic models
- ROP models with demand variability
- Production Scheduling
- Lean systems

**Topics in Operations Research and Decision Systems**

This course introduces advanced optimization tools and techniques with the main emphasis being on the application of computational intelligence algorithms to different problems and cases which arise in business and industry, such as vehicle routing and scheduling problems, packing problems, facility location and layout problems, project scheduling with resource constraints problems, workforce and manpower scheduling problems, timetabling problems, machine scheduling problems, port logistics problems, telecom problems, waste management problems, health care problems, maritime and shipping problems.

On completion of this course, students should be able to broaden their exposure to computational methodologies, analyze and design effective computational intelligence algorithms for complex business problems, provide examples and cases of how the computational intelligence algorithms can be used to solve real-life problems.

The course material includes the following thematic areas:

- Threshold accepting algorithms

- Tabu search algorithms

- Swarm Intelligence and Ant colony optimization

- Evolutionary computation and genetic algorithms

- Scatter search and path relinking

- Decision support systems and computational intelligence algorithms

- Examples and real life applications


### *Stream V: Software and Data Analysis Technologies*

**Software Engineering in Practice**

While most Information Systems and Computer Science courses traditionally deal with the development of new systems, in practice developers spend the largest part of their time in software life-cycle activities that follow the development phase. The objective of the course is to allow students to read, understand, and evaluate a system's software elements (code, structure, architecture). Having followed this course, students should be able to intelligently decide on how existing systems will be maintained, setup design and evolution strategies for legacy code, and prescribe the use of refactoring for dealing with architectural mismatches and low-quality code.

An innovative aspect of the course involves the use of Open Source Software (OSS) in course examples and exercises. Through the study of OSS students will be able to see how non-trivial applications like the Apache Web server, the Postgres Relational Database Management System, the Jakarta Java servlet container and the Cocoon framework are structured.

The course contents are:

- Code as Part of the Software Development Process

- The Open Source Landscape

- Tackling Large Projects

- General Purpose Tools

- Version Control

- Build Management

- Collaboration

- Performance Measurement and Management

- Code-Reading Tools

- Inspection and Testing

- Coding Standards and Conventions

- Documentation

- Maintainability
- Basic Programming Elements

## Digital Content Management and Human-Computer Interaction

The course introduces students to the basic concepts of Human-Computer Interaction, explaining fundamental concepts such the role of user's mental model of interaction, usability design principles, evaluation methods and techniques. Going beyond the fundamentals, at the second part of the course, advanced methods for improving user experience are presented in detail, including analyzing web site data (using google analytics), recommendation algorithms, exploiting social media and SEO techniques to improve site's effectiveness.

The expected learning outcomes include:

- Understanding of the fundamental principles of Human – Computer Interaction and the related concepts (e.g. interactivity)
- Development of skills that will enable the design and development of usable interactive systems
- Understanding of content architecture principles and practical tools
- Understanding and development implementation skills for the evaluation of interactive systems in terms of usability
- Design and development of value added services such as intelligent interfaces and personalization services
- Familiarization with the use of social media, Search Engine Optimization techniques as well as data analysis techniques (Google analytics, A/B testing)

Course contents are:

*Section 1: Fundamentals of Human-Computer Interaction*

- Basic concepts. The human as information processor.
- Interaction/interactivity, interaction styles, direct manipulation

*Section 2: Interface evaluation methods*

- Design rules and principles
- Heuristic evaluation, cognitive walkthrough, experimental evaluation

*Section 3: Analysis, design, and implementation*

- Requirements analysis
- Content organization, information architecture
- Content Management Systems
- Prototype development
- Implementation in desktop, web, mobile platforms

*Section 4: Advanced methods of digital content exploitation*

- Google Analytics, Conversion rate Optimization, Google Experiments

- Persuasion and Influence Strategies

- SEO

- Recommender and Social recommender Systems

### *Free Elective Courses*

**Ethics annd Responsibility Issues**

Ethics is one of the most important aspects of human behavior and concerns how people's actions interact and relate to the choices we make about ourselves and others. It is therefore directly related to business operation and decision making and is linked to key aspects of management (such as finance, marketing, human resource management and production).

In modern times, linking business to ethical, social and environmental issues is imperative. Society licenses companies to operate and increasingly requires companies to behave ethically and responsibly. Employees expect fair treatment and consumers respect for their rights. Likewise, other stakeholders push for transparency and accountability. To some extent, companies have understood these new conditions, have incorporated corresponding practices into their operation and have redefined the way they make decisions. However, ethical dilemmas arise on a daily basis as companies try to reconcile their profitability with the social and ethical aspects of their operation. Ethical dilemmas are also raised by modern technological developments as the development and use of new technologies such as artificial intelligence, the use of big data, etc. raise questions about the human-machine relationship but also the responsibilities that the individual and the company are called upon to take on the new data. Therefore, the relationship between Business, Technology and Ethics is worth discussing both in society and in the university environment.

The main goal of the course is to help students identify and evaluate the ethical and value dimensions of some of the decisions they will be called upon to make in the future. Decisions related to ethical issues are perhaps the most difficult and demanding. For this reason, the course is designed to confront students with real ethical dilemmas and to involve them through a fruitful dialogue in a process of analyzing the dimensions of each dilemma.

**Aimed results**

- Understanding the role of ethics in business. The recognition of ethical issues within companies

- The application of important concepts and theories (eg utilitarianism, ethics, etc.) on ethical values for resolving business issues

- Understanding the benefits of business ethics and relating to the concepts of competitiveness and sustainability

- Evaluation of individual behaviors in the context of business using theoretical models

- Understanding the concept and importance of social responsibility and its integration requirements in business strategy
- Understanding the concept and importance of Corporate Governance. Familiarity with the frameworks and regulations governing Corporate Governance
- Gaining a global understanding of current issues related to business administration, responsibility and governance
- Understanding the modern ethical dilemmas raised by the development of new technologies (artificial intelligence and ethics, big data and ethics, etc.)


## 2.7. 7th SEMESTER

### Entrepreneurship

This course introduces students to the notion of entrepreneurship while providing them with skills and knowledge regarding the whole cycle of the entrepreneurial process from opportunity identification and assessment to mobilising resources creating the enterprise, managing for growth and ending the new venture. An introduction to the notion of social entrepreneurship and the development of social enterprises is also made in the frame of the course. More specifically the course includes three parts, referring to the:

- Notion and importance of entrepreneurship and its environment
- Entrepreneurial process: Creativity and business idea, business model, business planning, securing resources and agreements, growth strategies and exit strategies.
- Sources of capital and financing in all stages of growth.

The course material includes the following thematic areas::

- Introduction to the notion of entrepreneurship
- The eco-system of entrepreneurship
- Innovation and creativity
- Business idea – Business model
- Business plan (I): Development
- Business plan (II): Evaluation
- Software for the development of the financial statements of the business plan
- Foundation of the venture
- Managing and growing the venture
- Exit strategies
- Sources of capital and financing in all stages of growth.
- International entrepreneurship
- Social entrepreneurship

### Stream I: Operations Research & Business Analytics

**Stochastic Modeling & Simulation**

This course examines on one hand the fundamental types of stochastic models employed within Management Science and, on the other hand, the use of simulation techniques in cases where stochastic methods are of limited applicability. In addition, it discusses the application of all the above in real settings of decision support, using simulation software packages.

Stochastic modeling includes mostly Markov processes and Markov chains, while also examining topics in Queuing Theory, Replacement Theory and basic principles of Stochastic Dynamic Programming.

Simulation refers mostly to discrete event simulation, while presenting also techniques for model building and validation and analysis of simulation output. Emphasis is given to the construction of simulation models through appropriate software packages, hence part of the course is implemented via lab exercises and tutorials and through a compulsory project which includes all steps of applying simulation on a real-life problem.

The course material includes the following topics:

- Markov processes and chains
- Queuing Theory, Replacement Theory, Inventory Theory
- Stochastic dynamic programming
- Simulation as an experimental methods, applications in Management Science, basic simulation techniques
- Discrete even simulation, entities and activities, events and queues, resources activity cycle diagrams
- Simulation languages and packages, the SIMUL8 software
- Transient and steady state, input and output analysis, random-number generators, experimentation principles
- Simulation modeling of real-life applications, case-study discussion

**Combinatorial Optimization**

The course deals with the theory, algorithms and applications of discrete (also known as combinatorial) optimization with an emphasis on problems regarding flows, paths and matchings on graphs. More specifically, the course presents algorithms for the problems of shortest path, maximum flow, minimum-cost flow, maximum-cardinality and maximum-weight matchings (mostly regarding bipartite graphs) and, last, stable matchings and b-matchings on bipartite graphs.

Apart from solving such problems using specialized combinatorial algorithms, the students are also expected to formulate applications and real-life problems as flow, path or matching problems on graphs.

In addition, this course introduces general methods for discrete optimization problems that can be modeled as Linear Integer Programs, i.e., Branch-and-Bound and Branch-and-Cut.

The purpose of this course is the understanding of algorithmic design specifically for discrete optimization algorithms defined on graphs and integer programming methods. Apart from understanding all related notions, the purpose is to investigate the application of such algorithms (i.e., algorithms for paths, flows and matchings) on real-life problems.

The course material includes the following topics:

- Network Flows and Integer Programming
- Shortest-path algorithms: Dijkstra, Bellman-Ford, Floyd-Warshall
- Maximum-flow and minimum-cost flow algorithms
- Matching algorithms in bipartite graphs: maximum-cardinality matching, maximum-weight matching, stable matching and stable b-matching
- Applications modeled as flow problems: project management, job assignment to machines, distinct and restricted representatives, capital allocation, etc.
- Integer Programming: Branch-and-bound methods, Balas' additive algorithm, Branch-and-Cut methods
- Applications of Integer Programming
- Trees: properties, transversal algorithms, minimum-spanning tree algorithms, Steiner trees.

**Financial Engineering**

Financial Engineering provides the means of implementing financial innovation through the use of financial instruments like forwards, futures, swaps and options. Usual applications include the restructuring of corporate or investor cash flows in order to achieve tactical and strategic targets, with particular emphasis on risk management. Financial Engineering is at the forefront of innovation and development in financial markets, granting private investors, corporations and institutions almost complete flexibility in transforming existing cashflows into new cashflows with different quantitative and qualitative characteristics. This course aims to provide the tools, methodologies and skills necessary in order to understand, implement and innovate in this very active environment. Real case studies will be presented, demonstrating practical applications of the taught material.

The course material includes the following thematic areas: The course material includes the following thematic areas:

- Financial Engineering Mathematics
- Forwards & Futures Options
- Swaps, Caps & Collars
- Risk Management

**Business Analytics and Personalization Technologies**

The first part of the course deals with the analysis and utilization of the huge amount of data (information, products, services, product evaluations, etc.) available to Internet users and businesses operating in this environment with the aim of understanding and predicting human behavior and its exploitation to provide sophisticated and personalized services. The first part of the course aims to introduce the students to the techniques of analytical processing of interactive behavioral data from heterogeneous sources and to familiarize themselves with algorithms of behavior prediction and personalization of information.

The second part of the course aims to link theory to practice in a field that is critical to many of today's businesses: data analysis to better manage the supply chain and optimally respond to consumer needs. This course will emphasize the necessary theoretical background related to these topics, as well as the practical application of the corresponding concepts and models in different types of enterprises and in the context of collaborative practices. A series of case studies will be presented showing the export of knowledge from the data and the business impact from the practical application of this knowledge. It will also cover issues of modern technologies that support data export and analysis as well as efficient supply and demand chain management.

*__Stream II: Information Systems and Electronic Business__*

**Information Resource Management**

In this course, students learn to appreciate the opportunities and challenges from the use of ICTs, though in-class analysis and discussion of case studies from the international context, so that they can identify and manage similar situations efficiently when encountered in practice.

Students in this advanced course study how information systems in organizations can be managed so that information resources are efficiently used. Four main axes define the learning outcomes of the course:

- The strategic role of IT in contemporary business and strategic planning for information resources and systems
- The business role of IT as a tool for supporting and promoting business functions and management and the managerial skills associated with this role
- The functional structure (department/ services) of IT in contemporary business, its human resources and management
- Broader social aspects related to the use of IT in contemporary business

The course material includes the following thematic areas:

- Information sharing in organization
- Change management in the development and implementation of information systems (IS) in organizations
- Information resource management and IT department governance

- Broader information resource management issues (e.g. privacy) and their societal implications.
- Strategic value and international growth trends for the IT sector

**Digital Marketing**

The Information and Communication Technologies (ICT) effects on the Marketing theoretical models, strategies and practices have created educational needs upon the new knowledge emerging in the topic of Digital Marketing. The scientific research has illustrated the opportunities and capabilities of applying and extending the existing Marketing knowledge in the context of new conditions, requirements and particular characteristics of the Digital environment mainly since the emergence of the Web. Indicatively, the diffusion of alternative communication and shopping channels usage, the introduction of electronic applications with increased customization and personalization capabilities and the penetration of advanced applications for data collection, processing and exploitation have created new research areas and relevant theoretical and practical issues. Finally, while the course adopts an interdisciplinary approach (i.e. Marketing and Information Systems) it does not focus on "technical" issues and, thus, it does not require advanced Information Technology skills from students.

The learning outcomes of the course as summarized as follows:

- Acquire the necessary theoretical background in the area of Digital Marketing by adopting an interdisciplinary approach
- Recognize the research opportunities that emerge in the area of Digital Marketing and obtain experience in the design and execution of relevant research designs
- Understand the basic dimensions of the practical use of Digital Marketing applications in organizations and the basic issues that are connected with their effective exploitation
- Obtain experience regarding the capabilities offered by Information Systems for implementing actions in the context of strategic Marketing planning.

*Stream III: Strategy, Entrepreneurship and Human Resources*

**Personal Skills Development**

The successful manager nowadays is not the one who possesses the technical or managerial knowledge but the one who has developed appropriately the necessary personal skills to use this knowledge effectively. The current course attempts to "assist" students in developing these competencies, through a program of self-assessment and evaluation with a strong emphasis on interaction with colleagues.

The objectives of the course are the following:

- Students' self-assessment of their personal skills
- Applications of personal skills at work
- Using personal skills in job search activities and career management

Course contents include the following main subject areas:

- Introduction
- Self-assessment
- Learning and learning styles
- Stress and stress management
- Group dynamics
- Conflict and negotiation
- Influence
- Leadership and Emotional Intelligence development
- Job search and career management

**E-learning and Knowledge Management**

This course offers an overview of the most recent trends in learning and knowledge management in companies and organizations. Students will be introduced to strategies, methods and technologies of organizational learning and knowledge management helping them to develop analytical, development and judgmental skills. Students will be able to relate organizational and technological choices to performance improvements in organizations in the context of changing organizational environments. Practical skill in the implementation of e-learning programs and systems are also emphasized.

The course comprises two units; (1) E-Learning and (2) Knowledge Management. In the first students are introduced to concepts of organizational and workplace learning, training in the context of human resource development, and performance management. Methods and tools for digital instructional design are explained and then applied in practice by students in their course assignments. In the second unit, theoretical models as well as organizational practices concerning the creation, sharing and use of organizational knowledge and intellectual capital are explained. Cases from practice in various companies and organizations will be examined and the latest trends in knowledge management presented and analyzed.

The course contents are::

*Unit 1: E-Learning*

- Workplace learning, employee performance and the role of technology: concepts, methods and tools
- E-learning platforms, technologies, and instructional content development tools
- Methods for digital instructional design
- Issues of eLearning Implementation and Management

*Unit 2: Knowledge Management*

- New Challenges – New Organizational Forms.

- Knowledge Management: Definitions of notions, Measuring intellectual capital, Types and forms of knowledge, Knowledge objects, Knowledge and competitiveness, Overview of tools for knowledge management.
- Knowledge and Innovation.

## Advanced Topics in Strategy and Innovation

The purpose of this course is to make students understand selected issues related to strategy and innovation. Specifically to promote understanding of critical issues in the areas of strategy implementation and strategic change, governance and corporate responsibility, as well as with the management of innovation. It aims at providing knowledge, and also at developing students' skills in the application of strategy concepts, methods and tools in dealing with the specific issues addressed as well as by focusing on practical examples and cases, and application projects.

The course examines issues of strategy implementation, strategic change, and the management of innovation. More specifically:

- Unit 1: Basic concepts in strategic change and innovation
- Unit 2: Strategy implementation: from planning to implementing
- Unit 3: Management of strategic change
- Unit 4: Structural mechanisms for strategy implementation
- Unit 5: Strategic planning system
- Unit 6: Corporate Governance: purposes and goals, role of BoD
- Unit 7: Corporate Governance: critical issues, trends
- Unit 8: Sustainability and Social Responsibility
- Unit 9: Strategic management of non-profit organizations
- Unit 10: Innovation and competitiveness
- Unit 11: New product development processes
- Unit 12: Knowledge and Learning
- Unit 13: National Systems of Innovation

### Stream IV: Operations and Supply Chain Management

## Enterprise Resource Planning Systems

Enterprise Resource Planning (ERP) Systems are coherent and integrated software applications that can support a large variety of operational processes and business functions and a focal monitoring, control and coordination tool for all operations that take place in the headquarters and the distinct remote locations of modern enterprises. Via advanced database and communication technologies and sound coverage of diverse business functions, ERP systems achieve data centralization, integration of business software applications and business process redesign, all in the quest for process optimization,

productivity enhancements and gaining of competitive advantage through innovative information technology. For the successful enterprises and organizations within the Information and Knowledge Society, ERP Systems are the backbone transactional information platforms that allow quick response to the challenges emanating from the continuously evolving business landscape.

Within the mini-course the following areas related to ERP systems will be addressed:

- Introduction to ERP systems (What exactly are they?)
- Architecture and underlying technologies of ERP systems
- Business functions addressed by modern ERP systems
- The ERP advantage for large enterprises and SMEs
- Critical success factors for ERP implementation projects
- Methodologies for effective selection and implementation of ERP systems
- Demos of standard ERP functionality
- Case studies illustrating ERP implementations from Greece and abroad


**Analysis and Planning of Distribution and Transportation Systems**

This course deals with the analysis and planning of transport and distribution systems. The course consists of two parts. The first part is focused on the major operational features of transport systems, the relevant institutional environment, and methods for forecasting transport demand. The second part provides operational and tactical planning problems arising in designing and managing freight transport and distribution systems.

After completing the course the students are able to:

- understand the structure, the operations and the broader Political, Economic, Ecological, Societal, and Technological environment of the transportation system,
- develop and apply transport demand forecasting models,
- understand the characteristics of major decision making problems for transportation and distribution systems,
- develop and solve mathematical models for optimizing transportation and distribution decisions,
- understand the role and capabilities of advanced technologies, and will be able to assess the impacts of advanced technologies on the management of freight transportation systems.

The course includes the following sections:

- Transportation Systems Analysis: Transportation systems structure, operations, and the political, ecological, economical, social, and technological environment, characteristics of transport demand and supply, performance measures of transportation system and externalities (energy, environment, safety).

- Transport Demand Forecasting: categorization of transport demand forecasting methods, development and application of transport demand forecasting models, cases of transport demand forecasting applications.

- Transportation and Distribution Systems Planning: Introduction to Transport and Distribution Systems planning decisions, classification of mathematical models and algorithms for addressing transport and distribution planning and facility location decisions, case studies addressing real-world transportation, distribution and location problems.

- Telematics and Geographical Information Systems Applications in Freight Transportation problems.

### *Stream V: Software and Data Analysis Technologies*

**Business Intelligence and Big Data Analytics**

The usage of data in enterprise decision making has been identified as one of the most critical element for success in our data-driven society. The objective of the course is to present the theory and the techniques used in modern data analysis systems in a business context. This includes, architectures, algorithms, tools, applications and commercial systems.

The course contents are:

- Advanced modern database topics: query processing, transaction processing, main-memory databases, column-oriented databases.

- Business Intelligence: architecture, design and modelling of data warehouses, ETL, data cubes, OLAP, tools, systems.

- Data Mining: Architecture, the KDD process, classification, clustering, association rules, applications, systems.

- Large-scale data management: MapReduce, Hadoop and tools, NoSQL systems.

- Special Topics: Text analytics, data streams, data visualization, social media analytics

**Business Analytics and  Personalization Technologies**

The first part of the course deals with the analysis and utilization of the huge amount of data (information, products, services, product evaluations, etc.) available to Internet users and businesses operating in this environment with the aim of understanding and predicting human behavior and its exploitation to provide sophisticated and personalized services. The first part of the course aims to introduce the students to the techniques of analytical processing of interactive behavioral data from heterogeneous sources and to familiarize themselves with algorithms of behavior prediction and personalization of information.

The second part of the course aims to link theory to practice in a field that is critical to many of today's businesses: data analysis to better manage the supply chain and optimally respond to consumer needs. This course will emphasize the necessary theoretical background related to these topics, as well as the

practical application of the corresponding concepts and models in different types of enterprises and in the context of collaborative practices. A series of case studies will be presented showing the export of knowledge from the data and the business impact from the practical application of this knowledge. It will also cover issues of modern technologies that support data export and analysis as well as efficient supply and demand chain management.

## Applied Machine Learning

In this course the students will develop a full, professional, internet application, from the user interface, to architecture (three-tier, REST), to full implementation and deployment to a production environment. We will encounter a number of development frameworks (Django, Node.js, React, Angular) in different languages (Python, JavaScript), as well as production technologies (continuous integration, cloud computing, deployment tools). The students will be free to choose the technologies they prefer. Evaluation will be based on the final application. The main feature of the course will be mentoring to students when developing their application.

## Social Network Analysis

The aim of the course is to introduce students to social network analysis (SNA) and their instrumental value for businesses and the society. SNA encompasses techniques and methods for analyzing the constant flow of information over offline networks (e.g. networks of workers in labor markets, networks of organizations in product markets etc.) and online networks (e.g. Facebook posts, twitter feeds, google maps check-ins etc.) aiming to identify patterns of information propagation that are of interest to the analyst. The course will help students to understand the opportunities, challenges, and threats arising by the use of social networks as far as businesses and the society at large are concerned. The issues of innovation diffusion and information spread through networks will also be covered. Finally, students will be introduced to the concepts of the wisdom of the crowds and social learning, investigating the conditions under which opinion convergence (asymptotic learning) or herding may occur in social networks.

### *Free Elective Courses*

## Investment Analysis

The Investment Analysis course aims in presenting to the student of modern criteria, methodologies and tools necessary for understanding, evaluating, comparing and obtaining optimal investment decisions as appropriate. It offers a balanced and comprehensive picture of investment options such as those presented in practice and organize the thematic units in such a way so as to facilitate their practical application. The course aims to both theoretical training and familiarity with applications, analytical tools and practical problems. Prerequisite is basic knowledge of mathematics, statistics and finance. During the course there will be references to recent case studies of international and Greek investment space.

The course includes four main thematic units::

i.   Introduction to Investments

ii.  Investment and Portfolio Management

iii. Investment Valuation Models

iv.  Shares & Fixed-Income Securities Portfolio Management and Valuation


**E-learning and Konowledge Management**

This course offers an overview of the most recent trends in learning and knowledge management in companies and organizations. Students will be introduced to strategies, methods and technologies of organizational learning and knowledge management helping them to develop analytical, development and judgmental skills. Students will be able to relate organizational and technological choices to performance improvements in organizations in the context of changing organizational environments. Practical skill in the implementation of e-learning programs and systems are also emphasized.

The course comprises two units; (1) E-Learning and (2) Knowledge Management. In the first students are introduced to concepts of organizational and workplace learning, training in the context of human resource development, and performance management. Methods and tools for digital instructional design are explained and then applied in practice by students in their course assignments. In the second unit, theoretical models as well as organizational practices concerning the creation, sharing and use of organizational knowledge and intellectual capital are explained. Cases from practice in various companies and organizations will be examined and the latest trends in knowledge management presented and analyzed.

The course contents are:

*Unit 1: E-Learning*

- Workplace learning, employee performance and the role of technology: concepts, methods and tools

- E-learning platforms, technologies, and instructional content development tools

- Methods for digital instructional design

- Issues of eLearning Implementation and Management

*Unit 2: Knowledge Management*

- New Challenges – New Organizational Forms.

- Knowledge Management: Definitions of notions, Measuring intellectual capital, Types and forms of knowledge, Knowledge objects, Knowledge and competitiveness, Overview of tools for knowledge management.

- Knowledge and Innovation.

**Special Approaches to Leadership**

Leadership has emerged as one of the most important management tasks for a business / organization to achieve success. The ever-changing and increasingly competitive business environment calls for a more modern approach to leadership that promotes organizational goals and increases organizational efficiency. In this context, the course "Special Approaches to Leadership" seeks to examine and analyze the most modern scientific approaches and practices in leadership and to focus on the parameters of leadership success as a function of the executives of all hierarchical levels.

The content of the course includes the following basic thematic sections:

- Introductory leadership concepts, leader-manager differences

- Personal characteristics and behaviors of leaders

- Modern forms of leadership

- Systemic approach to leadership

- Developing leadership skills


**Development and Design of Mobile Applications**

The aim of this course is to develop the students' skills in the design and development of new services and business activities, exploiting the opportunities and prospects offered in the mobile field. Students will be trained in all aspects of mobile business and will have the opportunity to design and implement a prototype of their idea using a visual programming platform and to analyze their business utilization. Having attended this course, students are able to recognize the main components of success in mobile business, understand the basic techniques of producing innovative digital ideas, product / service design and business model development in mobile business, analyze the process of developing a new online service / mobile application and understand the concept of building a working group, the necessary business processes and other common challenges facing when developing a new business / service in mobile business.

The course aims to provide students with the knowledge, the tools and strategies needed to:

- To learn the main components and critical success factors in mobile business and the need for interdisciplinary approach

- Learn basic techniques for generating innovative digital ideas, designing a smart mobile phone or service.

- Design different business models in mobile business

- Analyze how to develop a new e-service / mobile application and a corresponding business idea

- To design the new mobile phone application by focusing the user

- Quickly develop originals with or without code and conduct research with users

- Understand the concept of building a working group, the necessary business processes and other common challenges encountered in developing a new business / service in mobile business.

**Employability Development in the Digital Age**

Professionals of various industries and organizations often talk about the gap between the education system and the workplace. Business executives report that recent graduates entering a working environment for the first time often do not know how to behave, what to expect, and how to "get through" the theory in practice. Personnel recruiters claim that they meet graduates / recent graduates who are not adequately prepared to claim a job or do not show professional behavior. Indeed, the same job seekers often say they have difficulty presenting themselves by highlighting their strengths and successfully claiming a job. Finally, perhaps the most important for entering and staying on the labor market are the trends of the digital era and the 4th Industrial Revolution, which require new knowledge and skills for both looking for and maintaining a job.

Recognizing the above needs, the "Employability Development in the Digital Age" course was designed to meet the demands of modern times and to enhance the desired skills and behaviors for entering and staying in the workplace, in other words, to develop the employability of graduates.

**Final Year Project**

In Final Year Project the student has the opportunity to deal with a serious research topic, following a specific course. With the close supervision of a professor of the Department, he investigates a specialized subject of the curriculum through serious bibliographic research, empirical research or development of a model system / technique / procedures etc. The Final Year Project can be implemented in the 6th or 7th semester with the assent of the supervising professor (and the relevant approval by the General Assembly) and is a substantial preparation for postgraduate studies.

## 2.8. 8th SEMESTER

**Digital Innovation and Entrepreneurship (Stream II)**

E-Business offers the opportunity for increasing the competitiveness of enterprises (with innovative business models, with personalized services, business analytics etc.) and the creation of new enterprises exploiting the potential of digital media (e.g. internet). Innovation is also an essential tool in the modern business environment for increased productivity, value added impact, international competitiveness and sustainable development. This course covers the above two trends (i.e. the connection of digital services and new entrepreneurship) through an interdisciplinary approach.

The aim of the course is:

- The students to acquire the specialized knowledge in technical and organizational aspects of e-business
- To be able to understand the potential of innovation and strategy for dynamic new companies (start-ups)

- To obtain the necessary knowledge to design innovative technological services / products and the development of a comprehensive business plan

- To use the above in order to create innovative business models / services / business in a real life environment with emphasis in new technologies

The course includes topics such as:

- Business models of e-business

- Technological and functional developments in digital media

- Design innovation in business services / products, processes etc.

- Strategy for innovation and digital entrepreneurship

- Design and development of a business plan

- Development and funding new businesses

- Critical success factors in the running of new business

**Internship - Thesis**

The Internship is an obligation of students during the program of studies in which students are employed in real business environment utilizing and integrating the knowledge they have acquired. Alternatively is an opportunity for students to create a new business activity using the technologies and the conditions of the modern business environment.

Students work in departments / operations (e.g. Logistics, Supply Chain, Analytics, Production, Services, IT, Human Resources, Marketing and Sales, Finance) of the business that offers them to host. During the internship, they are familiar with the functions, practices and management systems applied by the company and participate in them, under the guidance of an executive for that purpose. At the same time, their employment is supervised by a Professor of the Department. Alternatively, students are engaged in a specific and prescribed by the company project which has been agreed with the internship coordinators and falls within the Department's disciplines. There is also the opportunity for students to participate in the development of a new entrepreneurial activity that interests a company.

*Free Elective Courses*

**Organizational Theory**

The course deals with the exploration of theoretical currents and schools of thought around the existence, interpretation, and analysis of the phenomenon of organizations. Why are there organizations in the form we know them, and not in others, alternatives? How can we understand them? How can we interpret their behavior?

There is a plethora of theories that address the above questions, theories that come mainly from the basic disciplines of sociology and economic science. In this lesson we will discuss some of the most important and influential of these theories. We will refer to their problems, to the conceptual tools and arguments / arguments they use to reorganize the phenomenon of organization and organization, we

will see their fields of application as well as the empirical findings that verify (or reject) their basic assumptions.

Final aim is to familiarize students with the theoretical currents and optical targeting, each from his own perspective, to explain and shed light on the existence and functioning of organizations as a distinct social formations.

The content of the course includes::

- Lesson 1: Introduction and general overview

**SECTION 1: THE SCIENTIFIC BACKGROUND**

- Lesson 2: Organizational Theory: the perspective of "rational" systems

- Lesson 3: Organizational Theory: the perspective of "natural" systems

- Lesson 4: Organizational Theory: the perspective of "open" systems

**SECTION 2: ORGANIZATIONAL THEORIES**

- Lesson 5:  Contingency theory

- Lesson 6:  Behavioral theory

- Lesson 7:  Institutional theory ("old" and "new")

- Lesson 8: Evolutionary Theory & Evolutionary Economics

- Lesson 9: Resource Dependence

- Lesson 10: Transaction cost economics

- Lesson 11: Agency theory

- Lesson 12: Industrial Organization

- Lesson 13: Resource-based view of the firm


**Big Data Management Systems**

The use data in making accurate, reliable and timely decisions has become a "sine qua non" factor of success for most modern businesses and organizations. At the same time, in recent years, with the development of new technologies and applications - such as the spreading of social networks, the extensive use of smart phones, the installation of sensors etc. - the volume and format of the data has changed dramatically: We now have volumes of petabytes and exabytes data in both text, audio, video, and image formats. The need to manage and exploit this data has led to the development of a new generation of systems, models and programming tools that are still in the embryonic stage such as: Map Reduce, Hadoop and its ecosystem, NoSQL, etc. Technologies enabling parallel data processing on a large scale and fault-tolerant way. The purpose of this course is to present the basic principles of these systems and how they work.

The course contents include::

- Basic knowledge: query processing, distributed and parallel query processing, distributed systems

- Programming language: Python

- MapReduce, Hadoop and ecosystem

- NoSQL, Key-Value Systems, Learning Redis

- NoSQL, Document-Store Systems, MongoDB learning

- Data Flow Management and Applications

- Interconnectivity in Large Data Management Systems

### 3.1 EDUCATIONAL MATERIAL DISTRIBUTION INFORMATION SYSTEM

([http://edu.dmst.aueb.gr/](http://edu.dmst.aueb.gr/))

The use of new technologies in the field of education is established every day in our country as well as in the whole world. In this context, in recent years, University Institutions have been constantly striving to create remarkable technological infrastructures that will be able to support and facilitate educational work. Such efforts start gradually from the pilot phase and then go through to the stage of maturity and functional exploitation of new technologies by providing high quality services in conducting the educational process.

The Department of Management Science and Technology is a pioneer of Greek Universities in issues of application and exploitation of new technologies in education, since May 2004 has a consolidated student information system and electronic distribution of educational material, EDUPORTAL. EDUPORTAL is developed on the basis of the international standards of the best foreign university institutes (e.g. Open courseware MIT) and aims at better and more efficient management of the material used as teaching material in the Department of Management Science and Technology.

This technology infrastructure allows for further escalation of the digital educational services provided by the department in the direction of e-learning, such as personalized services to students and digital interactive educational material, by providing information on each course and at the same time enabling teachers to structure and determine their own way their course material is displayed their on each website as well as when it is available to students. The system aims at managing the educational content of the entire undergraduate program of the Department of Management Science and Technology, associating the teaching material presented to the class with the teaching program and integrating the presentation of the material with the rest of the information related to the course. The use of the system has already escalated in the postgraduate programs of the department. The main axes of the purpose of using the system are:

- Building the content of each course according to its teaching program.
- The differentiation of the presented material: main teaching material, auxiliary material, announcements, teacher contact details, and course description are presented and processed in separate sections on the page of each course.
- The ability of updating the digital content directly from the instructor.


### 3.2. ERASMUS+ STUDENT EXCHANGE PROGRAM

**Goals and Operation of the Program**

The Erasmus+ program is an action on European cooperation in the field of higher education. In particular, it includes::

- Organized student exchanges for recognized periods of study and / or internship

- The European Credit Transfer and Accumulation System (ECTS)

- Mobility and exchange of teaching staff

- Language preparation for outgoing and incoming students and staff

- Intensive short-term teaching programs

- Activities to develop joint programs on all levels of study

- Language studies combined with other academic scientific disciplines

- University collaboration projects on issues of mutual interest (Thematic Networks)

- Preparatory visits for future cooperation activities

- Application of open and distance learning methods.

In order to increase mobility costs (travel costs, language preparation and cost of living), the European Commission grants scholarships to students selected to participate in the Erasmus Program for a period of 3-12 months of recognized studies abroad.

The European Commission encourages moving abroad as a means of improving the quality of academic cooperation for the benefit of students and educational institutions. Studying and practicing abroad is an invaluable experience. It is not only the best way for the student to enrich his knowledge of other countries, ideas, languages and cultures, but also a very important part of the development of professional and academic career prospects.

Students who are interested in studying abroad will look for

- curricula adapted to their own programs

- full academic recognition, guaranteeing that they will not waste time and courses while studying abroad.

**INFORMATION:**

Erasmus+ Program Site: https://www.aueb.gr/en/erasmus


**ERASMUS+ Program in the Department of Management Science and Technology**

During the program's operation in our department (2002-present), 664 DMST students took part. These students stayed for a semester or a whole academic year with successful results in their studies and returned to the University with excellent impressions from their experience.

|  | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Outgoing Students** | 2 | 10 | 29 | 18 | 29 | 22 | 32 | 29 | 22 | 31 |
| **Incoming Students** | 0 | 5 | 19 | 16 | 21 | 24 | 28 | 43 | 25 | 17 |
|  | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| **Outgoing Students** | 55 | 40 | 42 | 50 | 37 | 44 | 53 | 62 | 5 | 51 |
| **Incoming Students** | 22 | 26 | 33 | 49 | 47 | 48 | 47 | 61 | 56 | 62 |

The faculty members of the Department provide the following courses in English to incoming **ERASMUS** students.

**Winter Semester**

1. Management of Information Systems
2. Managerial Decision Making
3. Modern Enterprise Information Systems
4. Innovation in organizations knowledge, creativity and the processes of innovation
5. Information Resource Management

**Spring Semester**

1. Production and Operations Management
2. Applied Software Engineering

**Contact**

**Academic managers** of Erasmus+ program in the department are:

Prof. Irene Voudouri, e-mail: ivoudour@aueb.gr

Prof. Eric Soderquist, e-mail: soderq@aueb.gr

**Secretarial support:**

Kelly Vourloumi, e-mail: kvourloumi@aueb.gr

**Information for the Erasmus+ program at the Department:**
https://www.dept.aueb.gr/en/dmst/content/erasmus-program

**3.3. TUTORS**

The institution of the Supervising Professor (tutor) is one of the innovations of the Department of Management Science and Technology. The Tutor is the contact point of the student, throughout his/her studies, with the Department and advises him/her on issues of academic progress, participation in the academic community, access to AUEB services, difficulties in attending and learning, questions on academic issues as well as for personal issues that create difficulties in his/her studies.

| Head of the Department: Professor N. Pouloudi |
| --- |
| Vice Chairman: Associate Professor E. Kritikos |
| Secretariat: Ch. Sakellariou |

**INFORMATION:**

Secretary of the Department of Management Science and Technology

76 Patission Str. ■ 104 34 ATHENS ■ Tel.: +30 210 82.03.129 / 139 / 408 / 110
■ https://www.dept.aueb.g/dmst ■ e-mail: dmst@aueb.gr