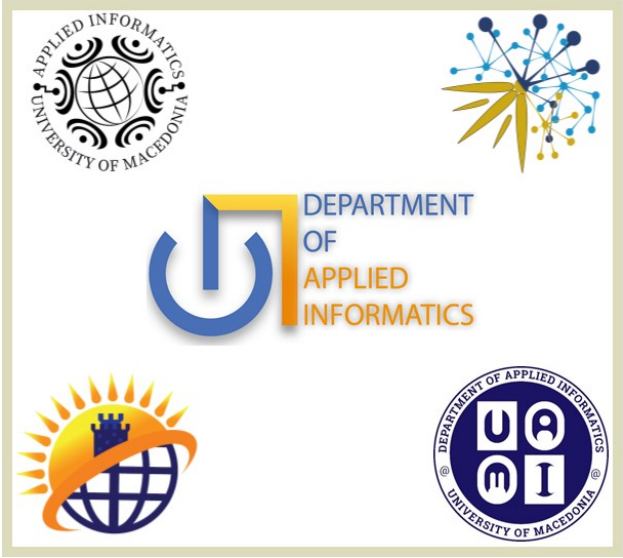
SCHOOL OF INFORMATION SCIENCES

Department of Applied Informatics



Study Guide 2019-2020

Contents

Department of Applied Informatics

The Department of Applied Informatics of the University of Macedonia stands out for providing knowledge and performing high-quality research in the fields of Computer Science and Technology, and Information Systems. The distinct characteristic of the Department is the adjustment of the Program of Studies to the continuously evolving market needs in Informatics, as well as the emphasis on the study and development of systems for applications in Economics, Finance, and Administration. The subject and the quality of studies contribute to the rapid integration of graduates in the market of Information and Communication Technologies (ICTs), their successful professional development in the private and the public sector, and the admission to prestigious Universities abroad and in Greece for postgraduate studies.

The Department is manned with well-qualified and seasoned faculty members and is backed by modern IT infrastructure ensuring to students the environment for obtaining theoretical knowledge and professional skills. Faculty members, beyond teaching and students' supervision, conduct research activities on various subfields of Applied Informatics participating in national and international research programs, in collaboration with international research groups. Furthermore, the Department is supported by well-trained administrative staff overlooking and improving the conditions of everyday students' life. The Department of Applied Informatics, an integral part of the University of Macedonia, enjoys the provision of high-quality infrastructure to all students, such as the exemplary Library and Info Center, the Accessibility Unit for Students with Disabilities, the Students Support & Consulting Center, the Sports Center, etc.

Department of Applied Informatics Quality Policy

The **vision** of the Department of Applied Informatics is for both professors and graduates of the Department to become acclaimed scientists and professionals in the field of Information Technology and its applications in the economy and society.

The **Mission** of the Department is:

- to promote and transmit knowledge through teaching and research in the field of Computer Science with particular emphasis on the development of systems for their application in Economics, Finance, Management and other social sciences and
- to train high-level executives for the needs of the public and private sector.

The fact that both undergraduate and postgraduate studies of the Department of Applied Informatics give emphasis on Information Science as well as Finance, Economics, Management and other Social Sciences, gives a strong **comparative advantage** to the Department by significantly differentiating it from other Informatics Departments operating in Greece. Graduates of the Department acquire high-level knowledge and skills in Information and Communication Technologies, as well as in their main applications in contemporary economy and society. Particularly, after the updating of the Undergraduate Program and the creation of two new introductory Specializations ("Computer Science and Technology" and "Information Systems"), the interdisciplinary character of the Department is further enhanced, the courses offered conform to the needs of the business world (in titles, content and learning outcomes) and the Department's Undergraduate Program is consistent with internationally recognized undergraduate standards.

To maintain the above advantages, a quality policy is designed and implemented to ensure high quality studies promoted by all the faculty activities.

The main **Quality Policy** pillars of the Department of Applied Informatics are:

- The high quality of the Undergraduate Study Program in terms of expected learning outcomes, the expected qualifications (according to the European and National Qualifications Framework) and the subject matter of the courses offered.
- The high quality of the educational process with emphasis on the needs of students and its connection to the labor market.
- The high quality of research and its promotion within the scientific community and society, as well as the assessment of its impact.

The main **success factors** of the Department's Quality Policy are:

- The attraction of ambitious, high-level students, who then develop into acclaimed scientists and professionals in the field of Informatics and its applications.
- The attraction of highly qualified scientific and administrative staff and its continuous development.
- The adequacy and appropriateness of the Department's technical infrastructure.

Through its bodies and committees, the Department designs and implements the appropriate procedures to ensure quality of its services. The **Internal Evaluation Team**, the **Curriculum Committee** and the **Foreign Relations Committee** play an important role in ensuring the quality of the Department's services. Specifically, the Internal Evaluation Team, in collaboration with the University 's Quality Assurance Unit, draw up the annual internal evaluation report, the Curriculum Committee updates the Undergraduate Program when such action is required and the Foreign Relations Committee designs and coordinates the Department's outward activities. In addition, when an external evaluation of the Department is imminent, a **Certification Committee** is set up with a view to undertaking the drafting of the Undergraduate Program's Academic Certification Proposal.

Some of the quality assurance procedures are designed and implemented at a University level (e.g. student counseling and support), others are carried out within Departments (e.g. students' evaluation on courses and teachers), while others are implemented according to the relevant legislation (e.g. admission of students to the Department). A rather detailed description of the procedure is reported and presented on the University and Department websites. The Dean of the School of Information Sciences and the General Assembly of the Department establish procedures, as appropriate, for resolving critical problems (recurring or not) that disrupt the proper functioning of the Department. For example, the General Assembly of the Department has set a specific annual procedure with deadlines which includes consultation, submission of proposals and other actions for a continuous improvement of the Undergraduate Program. Depending on the nature and subject matter of the process, there may be key performance indicators whose values are calculated and compared based on the data collected at University and / or Department level (by Internal Evaluation Team). In the future, efforts will be made to collect data and execute processes (where permitted) in a fully electronic manner. Either in whole or partially, several processes (e.g. grading, student communication, teaching) are carried out electronically.

The promotion and development of collaboration with other Greek or foreign bodies, institutes and organizations is of great importance in order for the Department of Applied Informatics to become a pole of attraction for educational and research activities and to further promote the city of Thessaloniki for scientific and business initiatives.

Accordingly, within the framework of quality assurance, the following constitute objectives and actions:

- Enhanced stakeholder awareness of the benefits of continuous evaluation and improvement (information meetings, workshops, etc.).
- Involvement of all parties concerned in the functions of Content Management System (CMS).
- Preliminary discussions and consultation on important issues, with all members of the Department prior to the decision-making Assembly.
- Intensification of research activity and publications in the context of the List of Acclaimed Journals compiled by the University for award conferrals to faculty members who publish their work.
- Maximization of participation in research projects, both Greek and international, and in basic research programs designated by the University.
- Orientation of basic and applied research towards innovation.
- Enhancement of the Department's collaborations with research and professional bodies within Greece and abroad.
- Enrichment of overseas academic departments with which the Department has concluded bilateral Erasmus+ mobility agreements.
- Establishment of a Center of Excellence.
- Intensification of internships in order for students to meet the demands of the labor market.
- Periodical evaluation of all Department functions for their continuous improvement.
- Periodic evaluation of the Undergraduate Program against current international curriculum guidelines, and its continuous updating in content or enrichment with new courses.

- Periodic evaluation of the Undergraduate Program and its continuous alignment with labor market requirements / Biannual report recording curriculum gaps in relation to industry indicators.
- Alumni observatory in order to receive feedback.
- Announcement of new Faculty vacancies with specific justification rationale and explicit reference to the courses they will undertake from the list of existing ones as well as the new courses that they will potentially offer.

It should be noted that the Quality Policy of the Department of Applied Informatics is aligned with the Strategy and Objectives of Quality Assurance of the University of Macedonia.

Academic Staff

Faculty of the School

Dean of the School
Chatzigeorgiou Alexander
Head of the Department
Chatzigeorgiou Alexander

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UNDERGRADUATE STUDIES

General Information

Studies in the Department of Applied Informatics

The aim of the Department is:

- To promote and transmit knowledge through teaching and research in the field of Computer Science with particular emphasis on the development of systems for their application in Economics, Finance, Management and other social sciences and
- To train high-level executives for the needs of the public and private sector.

The Department of Applied Informatics from the academic year 2019-2020 offers **2 introductory specializations**:

Introductory Specialization **Computer Science and Technology**	**Introductory Specialization** **Information Systems**
Aim: To provide students with a high level of knowledge and skills in Computer Science and Technology and train them in modern informatics techniques and technologies as well as in their applications in the modern business environment. **Objectives:** 1. Understanding the basic principles and foundations of Computer Science, as well as broader scientific methods, enabling graduates to develop solutions to real problems regardless of the changes that may occur at technological, economic and social level. 2. Meeting the needs of the labor market for highly qualified graduates in problem solving using computers, software development and technology, databases, computer systems and networks, web applications, system security. 3. Developing the ability to analyze, design, develop, manage and implement software systems and applications with emphasis on software, in combination with the ability to critically evaluate the approaches and techniques used. 4. Developing professionals capable of playing a dominant role in various business and academic activities of Computer Science and Technology. 5. Providing effective teamwork skills, computer troubleshooting, and professional presentation of related	**Aim:** To provide students with a high level of knowledge and skills in Information Systems and to train them in utilizing existing and emerging Information and Communication Technologies in businesses. **Objectives:** 1. To provide a comprehensive background in computer science combined with the necessary organizational, management as well as entrepreneurship and innovation knowledge. 2. To develop the ability to appreciate the importance of information systems in a business environment and to clearly identify the relationships between information systems and businesses in order to align information systems with business strategy. 3. To develop the ability to analyze, design, develop, manage and implement information systems, in combination with the ability to critically evaluate the approaches and techniques used. 4. To understand the role of information systems in fostering entrepreneurship and innovation and in creating startup technology businesses. 5. To provide effective teamwork and team management skills, as well as competencies related to problem solving, and professional presentation of business proposals. 6. To develop skills related to career development in a

solutions.

6. Familiarizing students with the wide range of research challenges in Computer Science and Technology by enabling them to participate in research activities.

Learning Outcomes

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

A. Knowledge and Understanding

1. know and understand the basic mathematical concepts related to Computer Science

2. understand and apply a wide range of principles and tools required in software development, such as design methodologies, selection of appropriate algorithms, programming languages, and human-computer interaction techniques

3. understand the operating principles of computing systems including architecture, networks and communications

4. explore the broader economic and administrative context in which Computer Science is embedded, including issues such as business development, quality, reliability, security, legal and ethical issues

5. understand and apply a scientific approach to the development and management of computer systems and applications

6. possess sufficient knowledge and critical thinking ability in a multitude of areas of Computer Science and Technology to identify research challenges and research contexts.

B. Intellectual skills

1. solve problems related to the analysis, design, implementation, control and maintenance of computer systems

2. identify and critically evaluate solutions to real problems that need to be addressed by computational methods, taking into account business and administrative constraints

3. search, evaluate and synthesize information from different sources

4. associate professional, legal and ethical issues as well as security issues with the development and use of computer systems and applications

5. communicate effectively both for understanding needs and for publicizing their work.

C. Professional and Practical Skills

1. design and undertake the completion of software projects

2. design, implement, control, and maintain computer programs in various programming languages

3. solve computational problems by selecting or developing appropriate algorithms

4. develop internet and portable computing devices applications

business or research / academic environment.

Learning Outcomes

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

A. Knowledge and Understanding

1. know and understand the fundamental mathematical concepts, statistics, business management and economics for information systems

2. become familiar with the concepts and theories related to the development and operation of markets in which resources, goods and services will be aligned with customer expectations and service

3. understand the development, management and exploitation of business information systems, their impact on organizations and the use of information systems for business and management applications

4. develop appropriate policies and strategies within a changing environment, responding to the needs and interests of the shareholders and managers of a business, as well as understanding current business issues

5. obtain insight into information systems, computer systems and networks, systems analysis and design, knowledge management and Internet systems

6. understand and apply a scientific approach towards development of business information systems and project management.

B. Intellectual skills

1. model data and events to fit the requirements of an information system for the purpose of understanding, analyzing, identifying and communicating

2. formulate specifications for the development of information systems and apply problem-solving skills to those specifications

3. analyze and evaluate the extent to which an information system meets the criteria laid down for its use and future development

4. associate professional, legal and ethical issues as well as security issues with the development and use of computer systems and applications

5. document the business logic for implementing and developing a particular information system.

C. Professional and Practical Skills

1. apply information-oriented techniques to solve general business problems

2. formulate solutions to a number of problems (qualitative and / or quantitative) that arise out of modern business methods

3. develop interpersonal skills, which may include effective recording, negotiation, persuasion and presentation, as well as effective teamwork

4. identify, design, develop and control information systems

5. disseminate technical information to technical,

5. design and manage computer systems, databases and computer and communications networks 6. make use of available tools to support the process of developing a computing system within a business or organization 7. prepare and present technical reports in an effective manner considering the available time, site and audience. **D. Transversal skills** 1. demonstrate personal responsibility and effective management while working with limited resources and multiple time constraints on complex activities 2. communicate effectively with both non-specialists and professionals of the field of Informatics 3. develop personal productivity skills that may include the use of worksheets, databases, word processors and presentation software 4. develop study habits and acquire independent and self-managed learning skills, along with the ability to work as a team member 5. demonstrate personal, organizational, problem-solving, decision-making, interpersonal, time and resource management skills 6. acknowledge the need for continuous professional development along with the need for lifelong learning.	administrative, academic and user audiences 6. operate computing and networking infrastructure effectively based on an understanding of information systems. **D. Transversal skills** 1. develop communication skills that may include the ability to present qualitative and quantitative information using the appropriate methods for each audience 2. develop personal productivity skills that may include the use of worksheets, databases, word processors and presentation software 3. develop study habits and acquire independent and self-managed learning skills, along with the ability to work as a team member 4. apply numeracy skills in understanding and presenting cases with quantitative aspects 5. demonstrate personal, organizational, problem-solving, decision-making, interpersonal, time and resource management skills 6. acknowledge the need for continuous professional development along with the need for lifelong learning.

The purpose of undergraduate studies is to provide graduates of the Department with specialized qualifications that will enable them to successfully implement Information and Communication Technologies in all areas of economic and social activity. The central philosophy of the curriculum is that Information and Communication Technologies can be efficiently implemented if there is sound knowledge not only of the Science of Informatics but also of the scope of its application. Thus, students of the Department are required to attend advanced courses in Management Science, Economics, Finance, Business Administration, Quantitative Methods, as well as Computer and Internet Law. For the Greek education system, this variety of courses lends unique character to our program of studies.

Apart from the theoretical education topics offered to the students of the Department, special emphasis is given to applications related to the analysis, design, development and management of systems for processing, storing, retrieving and transmitting information in the fields of Business Administration, Economics and Finance. This way, graduates of this Department acquire the basic undergraduate knowledge on standard and current information and communication topics, as well as their applications in modern society.

Study Program / Courses Offered

During the academic year 2019-2020, all current students of the Department of Applied Informatics are offered the courses:

CS = Computer Science
IS = Information Systems
AI = Applied Informatics
TM = Technology Management

SEM.	COURSE TITLE/CODE	INSTRUCTORS	COURSE TYPE/SPECIALIZATION
1	ACADEMIC SKILLS IN ENGLISH (The course is taught in English) (AIC106)	Kantaridou Zoe	Compulsory CS-IS
1	ALGORITHMS (AIC101)	Samaras Nikolaos	Compulsory CS-IS
1	LINEAR ALGEBRA (AIC102)	Sifaleras Angelo	Compulsory CS-IS
1	PROCEDURAL PROGRAMMING (AIC103)	Satratzemi Maria, Chatzigeorgiou Alexandros, Xinogalos Stylianos, Sakellariou Ilias, Kaskalis Thedoros, Ampatzoglou Apostolos, Karakasidis Alexandros	Compulsory CS-IS
1	MATHEMATICAL ANALYSIS (AIC104)	Hristou - Varsakelis Dimitrios, Chalkidis Spyridonas	Compulsory CS-IS
1	COMPUTER SYSTEMS (AIC105)	Papadimitriou Panagiotis, Mamatas Eleftherios, Souravlas Stavros, Trakatelis Georgios	Compulsory CS-IS
1	INTRODUCTION TO COMPUTER SCIENCE (CSC101)	Margaritis Konstantinos	Compulsory CS
1	INTRODUCTION TO BUSINESS INFORMATICS (ISC101)	Madas Michael	Compulsory IS
1	MANAGEMENT INFORMATION SYSTEMS (ΠΛ0113)	Tambouris Efthimios	Core Course
2	COMPUTER ARCHITECTURE (AIC201)	Souravlas Stavros	Compulsory CS-IS
2	DATABASES (AIC202)	Evangelidis Georgios, Koloniari Georgia	Compulsory CS-IS
2	DISCRETE MATHEMATICS (AIC203)	Petridou Sofia	Compulsory CS-IS
2	MANAGEMENT AND TECHNOLOGY (AIC204)	Fouskas Konstantinos, Kitsios Fotios, Mastoras Thodoris	Compulsory CS-IS
2	DATA STRUCTURES (AIC205)	Satratzemi Maria, Koloniari Georgia	Compulsory CS-IS
2	PROBABILITIES (CSC201)	Vergidis Konstantinos	Compulsory CS
2	PROBABILITY AND STATISTICS (ISC201)	Nikolaidis Ioannis	Compulsory IS
2	INTRODUCTION TO ALGORITHM ANALYSIS (ΠΛ0509-2)	Satratzemi Maria	Core Course
2	FINANCIAL ACCOUNTING (ΠΛ0502-1)	Vazakidis Athanasios, Stavropoulos Antonios	Core Course
3	OBJECT-ORIENTED PROGRAMMING (ΠΛ0401)	Chatzigeorgiou Alexander, Xinogalos Stylianos, Ampatzoglou Apostolos	Compulsory AI-TM
3	COMPUTER ARCHITECTURE (ΠΛ0304-1)	Souravlas Stavros	Compulsory AI-TM
3	DATABASES I (ΠΛ0501-1)	Evangelidis Georgios, Koloniari Georgia, Karakasidis Alexandros	Compulsory AI-TM
3	STATISTICS II (ΠΛ0202)	Nikolaidis Ioannis	Compulsory AI
3	FINANCIAL MANAGEMENT (ΠΛ0502)	Dasilas Apostolos	Compulsory AI
3	DIGITAL ECONOMICS (ΠΛ0316)	Stiakakis Emmanuil	Compulsory AI
3	COMPUTER NETWORKS (ΠΛ0503-2)	Fouliras Panayotis	Compulsory TM
3	MANAGEMENT AND TECHNOLOGY (ΠΛ0317)	Fouskas Konstantinos	Compulsory TM
3	WEB TECHNOLOGIES (ΠΛ0318)	Kaskalis Theodoros	Compulsory TM
4	OPERATING SYSTEMS (ΠΛ0404)	Roumeliotis Manos	Compulsory AI-TM
4	DATABASES II (ΠΛ0601)	Evangelidis Georgios	Compulsory AI
4	LINEAR AND NETWORK PROGRAMMING (ΠΛ0313-2)	Samaras Nikolaos, Sifaleras Angelo	Compulsory AI
4	HUMAN COMPUTER INTERACTION AND GRAPHICS (ΠΛ0420)	Kokkinidis Konstantinos-Iraklis	Compulsory AI

4	COMPUTER NETWORKS (ΠΛ0503-2)	Fouliras Panayotis	Compulsory AI
4	SOFTWARE ENGINEERING (ΠΛ0613)	Chatzigeorgiou Alexander	Compulsory AI
4	PRODUCTION AND OPERATIONS MANAGEMENT (ΠΛ0836)	Nikolaidis Ioannis	Compulsory TM
4	OPERATIONS RESEARCH (ΠΛ0814-1)	Hristou - Varsakelis Dimitrios	Compulsory TM
4	PROBABILITY AND STATISTICS (ΠΛ0423)	Nikolaidis Ioannis	Compulsory TM
4	DIGITAL TELECOMMUNICATIONS SYSTEMS (ΠΛ0526)	Psannis Konstantinos	Compulsory TM
4	INTERNET TECHNOLOGIES (ΠΛ0424)	Kaskalis Theodoros, Xinogalos Stylianos	Compulsory TM
5	ECONOMETRICS I (ΠΛ0504)	Dritsakis Nikolaos	Compulsory AI-TM
5	MARKETING INFORMATION SYSTEMS (ΠΛ0114)	Vlachopoulou Maro	Compulsory AI-TM
5	COMPUTERIZED ACCOUNTING (ΠΛ0803)	Vazakidis Athanasios, Stavropoulos Antonios	Compulsory AI
5	DIGITAL TELECOMMUNICATIONS SYSTEMS (ΠΛ0526)	Psannis Konstantinos, Petridou Sofia	Compulsory AI
5	E-COMMERCE TECHNOLOGY (ΠΛ0521)	Georgiadis Christos	Compulsory AI
5	MULTIMEDIA TECHNOLOGIES AND COMMUNICATIONS (ΠΛ0520)	Kokkinidis Konstantinos-Iraklis	Compulsory AI
5	INFORMATION SYSTEMS ANALYSIS AND DESIGN (ΠΛ0603-1)	Tambouris Efthimios	Compulsory TM
5	NETWORK AND WEB APPLICATIONS SECURITY (ΠΛ0825)	Mavridis Ioannis	Compulsory TM
5	PROJECT PLANNING AND MANAGEMENT (ΠΛ0523)	Madas Michael	Compulsory TM
5	BUSINESS STRATEGY (ΠΛ0524)	Kitsios Fotios	Compulsory TM
6	INFORMATION AND SYSTEMS SECURITY (ΠΛ0713-2)	Mavridis Ioannis	Compulsory AI
6	INFORMATION TECHNOLOGY LAW (IT LAW) (ΠΛ0617)	Alexandropoulou Evgenia	Compulsory AI
6	OPERATIONS RESEARCH (ΠΛ0814-1)	Hristou - Varsakelis Dimitrios	Compulsory AI
6	ECONOMETRICS II (ΠΛ0709)	Dritsakis Nikolaos	Compulsory AI
6	PARALLEL AND DISTRIBUTED COMPUTING (ΠΛ0621)	Margaritis Konstantinos	Compulsory AI
6	ARTIFICIAL INTELLIGENCE (ΠΛ0701)	Refanidis Ioannis	Compulsory AI
6	SUPPLY CHAIN MANAGEMENT (ΠΛ0622)	Madas Michael	Compulsory TM
6	EMBEDDED SYSTEMS (ΠΛ0623)	Kaskalis Theodoros	Compulsory TM
6	ENTERPRISE ARCHITECTURES (ΠΛ0624)	Vergidis Konstantinos	Compulsory TM
6	MOBILE AND WIRELESS COMMUNICATIONS SYSTEMS (ΠΛ0841)	Psannis Konstantinos	Compulsory TM
6	QUALITY ASSURANCE AND QUALITY CONTROL TECHNIQUES (ΠΛ0625)	Nikolaidis Ioannis	Compulsory TM
6	SYSTEMS DEVELOPMENT TECHNOLOGY WITH PYTHON (ΠΛ0626)	Vergidis Konstantinos	Compulsory TM
7	INFORMATION RETRIEVAL AND SEARCH ENGINES (ΠΛ0734)	Koloniari Georgia	Elective AI-TM
7	MOBILE APPLICATION DEVELOPMENT (ΠΛ0733)	Chaikalis Theodoros	Elective AI-TM
7	INTERNET LAW (ΠΛ0725)	Milossi Maria	Elective AI-TM
7	ETHICS AND GOVERNANCE OF ARTIFICIAL INTELLIGENCE (AIE710)	Alexiadou Anastasia-Sofia	Elective AI-TM
7	ELECTRONIC GOVERNANCE (ΠΛ0840)	Tambouris Efthimios	Elective AI-TM
7	NETWORKS AND WEB APPLICATIONS SECURITY (ΠΛ0825)	Mavridis Ioannis	Elective AI
7	BUSINESS INNOVATION AND PRODUCTIVITY (ΠΛ0611-3)	Vlachopoulou Maro, Stiakakis Emmanuil	Elective AI
7	GAME THEORY (ΠΛ0722)	Refanidis Ioannis	Elective AI
7	COMPUTATION THEORY AND AUTOMATA (ΠΛ0506-1)	Refanidis Ioannis	Elective AI
7	DISTRIBUTED SYSTEMS (ΠΛ0809)	Margaritis Konstantinos	Elective AI
7	CRYPTOGRAPHY (ΠΛ0618)	Petridou Sofia	Elective AI
7	KNOWLEDGE DISCOVERY FROM DATABASES (ΠΛ0823)	Evangelidis Georgios	Elective AI
7	BUSINESS DATA COMMUNICATIONS (ΠΛ0731)	Psannis Konstantinos	Elective TM

7	INNOVATIVE SERVICE AND PRODUCT DEVELOPMENT (ΠΛ0740)	Kitsios Fwtios	Elective TM
7	COMPUTERIZED ACCOUNTING (ΠΛ0803)	Vazakidis Athanasios, Stavropoulos Antonios	Elective TM
7	BUSINESS MODELLING (ΠΛ0738)	Vergidis Konstantinos	Elective TM
7	DIGITAL SYSTEMS' DESIGN AND PROGRAMMING (ΠΛ0742)	Kaskalis Theodoros	Elective TM
8	BIG DATA MINING (ΠΛ0833)	Karakasidis Alexandros	Elective AI-TM
8	MONEY AND CAPITAL MARKETS (ΠΛ0608)	Dasilas Apostolos	Elective AI-TM
8	PROFESSIONAL SKILLS IN ENGLISH (The course is taught in English) (ΠΛ0834)	Kantaridou Zoe	Elective AI-TM
8	ELECTRONIC COMMERCE (ΠΛ0807)	Fouskas Konstantinos, Mastoras Theodoros	Elective AI-TM
8	COMBINATORIAL OPTIMIZATION (ΠΛ0842)	Samaras Nikolaos, Sifaleras Angelo	Elective AI-TM
8	CLOUD COMPUTING (ΠΛ0831)	Papadimitriou Panagiotis	Elective AI-TM
8	COSTING (ΠΛ0824)	Vazakidis Athanasios, Stavropoulos Antonios	Elective AI
8	COMPUTER NETWORKS DEPLOYMENT AND MANAGEMENT (ΠΛ0610-2)	Fouliras Panayotis	Elective AI
8	PROGRAMMING LANGUAGES AND COMPILERS (ΠΛ0827-1)	Sakellariou Ilias	Elective AI
8	PRODUCTION AND OPERATIONS MANAGEMENT (ΠΛ0416)	Stiakakis Emmanuil	Elective AI
8	SOFTWARE QUALITY ASSURANCE (CSC501)	Ampatzoglou Apostolos	Elective AI
8	SPECIAL TOPICS IN ECONOMETRICS (ΠΛ0815)	Dritsakis Nikolaos	Elective AI
8	VIRTUAL ENTERPRISES AND NEW TECHNOLOGIES (ΠΛ0724)	Stiakakis Emmanuil	Elective AI
8	MOBILE AND WIRELESS COMMUNICATIONS SYSTEMS (ΠΛ0841)	Psannis Konstantinos	Elective AI
8	CONSTRAINT LOGIC PROGRAMMING (ΠΛ0828)	Sakellariou Ilias	Elective AI
8	NEURAL NETWORKS (ΠΛ0806)	Refanidis Ioannis	Elective AI
8	LOGISTICS INFORMATION SYSTEMS (ΠΛ0819)	Madas Michael	Elective AI
8	WEB PROGRAMMING (ΠΛ0816)	Georgiadis Christos	Elective AI
8	BLOCKCHAIN TECHNOLOGIES AND DECENTRALIZED APPLICATIONS (ΠΛ0844)	Mavridis Ioannis, Fouliras Panayotis	Elective AI
8	WEB SERVICES AND TRANSACTIONS (ΠΛ0729)	Georgiadis Christos	Elective AI
8	HIGH PERFORMANCE COMPUTING (ΠΛ0705-1)	Margaritis Konstantinos	Elective AI
8	TAXATION FOR INDIVIDUALS AND BUSINESS ENTITIES (ΠΛ0620)	Vazakidis Athanasios, Stavropoulos Antonios	Elective AI
8	FINANCIAL RISKS MANAGEMENT (ISE801)	Dasilas Apostolos	Elective TM
8	NETWORK-CENTRIC SOFTWARE (ΠΛ0835)	Xinogalos Stylianos	Elective TM
8	TECHNOLOGICAL INNOVATION MANAGEMENT (ΠΛ0837)	Kitsios Fotios	Elective TM
8	ENTREPRENEURSHIP CASE STUDIES (ΠΛ0839)	Fouskas Konstantinos	Elective TM
8	ADVANCED INFORMATION SYSTEMS (ΠΛ0741)	Tambouris Efthimios	Elective TM

Course Enrollment Rules and Degree Acquisition Requirements 2019-2020

Specifically, the following shall apply, depending on the academic year of admission to the Department:

Students admission until 2018-2019	*Students admission year 2019-2020*
The courses of the 1st year of study (1st and 2nd semesters) are attended by students who were admitted during the academic year 2018-2019 or earlier but either they did not attend (eg. due to suspension of studies) or the course must be retaken. <u>1st and 2nd semester courses</u> All 1st and 2nd semester courses are taught jointly in the two new Introductory Specializations (those with AIC code prefix) and they are also offered to students who have been admitted until the academic year 2018-2019 and they are required to take the respective courses. These students are not offered the courses taught in either of the two Specializations (i.e. the courses with a CSC or ISC prefix). In addition, for the academic year 2019-2020 and exclusively for those who need to retake it, the following shall apply: • IT MANAGEMENT SYSTEMS-ΠΛ0113 will be offered, • In place of the abolished course ΠΛ0105-2 - INTRODUCTION TO ECONOMICS students should enroll to any Elective Course o Either to be examined instead of the abolished course o or if they have successfully passes it in the past. This course will be credited as a Compulsory Course. • Those who need to retake the courseΠΛ0112-APPLIED MATHEMATICS II, which has been renamed / assigned to the course AIC104-MATHEMATICALANALYSIS of the 1st semester, should be enrolled during winter semester 2019, in order to be examined in January. In the third Semester, students choose their Specialization and then the Specialization courses. <u>3rd, 4th, 5th, 6th, 7th, 8thsemester Courses</u> Courses of both specializations: i) APPLIED INFORMATICS- AI or ii) TECHNOLOGY MANAGEMENT - TM Some of these courses are taught jointly in both Specializations (AI + TM), and others are taught in only one of the two Specializations (AI or TM). Courses from the 3rd to 6th semester are compulsory, while courses of the 7th and 8th semester are elective.	Introductory Specialization: Students are enrolled in one of the two Specializations: 1. COMPUTER SCIENCE AND TECHNOLOGY 2. INFORMATION SYSTEMS 1st and 2nd semester courses Freshmen students, enrolled in the Introductory Specialization of the Department of Applied Informatics (COMPUTER SCIENCE AND TECHNOLOGY or INFORMATION SYSTEMS) are offered: a) Courses that are either taught jointly in both Introductory Specializations (Compulsory) and b) Courses taught in only one of the two Specializations (Specialization Compulsory) All these courses are considered as Core Courses, that is, Basic Courses of the Study Program. The type of each lesson can be identified by the prefix of the course code, as follows: - AIC course code prefix (e.g. AIC104 - MATHEMATICAL ANALYSIS) refers to courses taught jointly in both Introductory Specializations. - CSC course code prefix (e.g. CSC101 - INTRODUCTION TO COMPUTER SCIENCE) relates to introductory courses in COMPUTER SCIENCE AND TECHNOLOGY (CST). These courses are offered only to students of the respective Introductory Specialization. - ISC course code prefix (e.g. ISC101 - INTRODUCTION TO BUSINESS INFORMATICS) refers to courses of the Introductory Specialization of Information Systems (IS). These courses are offered only to students of the respective Introductory Specialization.

Course Outlines

1st Semester

ACADEMIC SKILLS IN ENGLISH (The course is taught in English) (AIC106) - CS-IS

Coordinator: Kantaridou Zoe

Semester: 1st (Winter) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Kantaridou Zoe*

General competences

The course familiarizes students with the English academic vocabulary, the conventions of academic writing (plagiarism, citations/ references, describing graphs) and the strategies needed to deal with them (note-taking, summarizing, rephrasing). It is built around contemporary topics in the fields of economics and informatics and aims to develop the students' personal reflection on and evaluation of the content. It requires a minimum of B1 level of competence.

Course content

1. University campus and facilities
2. Great personalities in Computer Science
3. Internet of Things (IoT)
4. Open source
5. Social networks
6. Introduction to economics
7. Academic abstracts & scientific articles
8. Describing trends
9. Talking about Greece
10. Globalisation

Assessment

Group assignments 50% and final exam 50%.

Course bibliography

(One of the following):

12519392 ENGLISH FOR ACADEMIC PURPOSES, Τύπος: Σύγγραμμα, KANTARIDOU ZOE, 2011, ΠΑΝ/ΜΙΟΥ ΜΑΚΕΔΟΝΙΑΣ, ISBN: 978-960-8396-61-6

59377892 TEXT ANALYSIS IN ACADEMIC ENGLISH - 2nd REVISED EDITION, Τύπος: Σύγγραμμα, KARAGEVREKI MERSINI, 2016, ΕΚΔΟΣΕΙΣ ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΜΑΚΕΔΟΝΙΑΣ, ISBN: 978-618-5196-19-6

Additional material

(http://compus.uom.gr/INF201/index.php)

ALGORITHMS (AIC101) - CS-IS

Coordinator: Samaras Nikolaos

Semester: 1st (Winter) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Samaras Nikolaos*

General competences

The student will (a) learn the algorithmic thought, (b) gain familiarity with basic algorithms for sorting and searching and (c) be able to implement these algorithms in C.

Course content

1. Algorithms and Problems. Historical review, Definitions and properties of Algorithms, Computational problems, Description of algorithms, Basic concepts of algorithms (Iterative, Recursive, Stochastic, Heuristic).

2. Iterative Sorting Algorithms. Selection Sort, Bucket Sort, Bubble Sort, Radix Sort.

3. Searching Algorithms: Linear Search, Binary Search.

4. Data Structures: Stack, Queue, Cyclic queue, Linked lists (single and double), Heaps, Heap Sort.

5. Recursive Algorithms: Factorial, Fibonacci Numbers, Anoi Towers, Transformation from recursive to iterative.

6. Divide and conquer: Quick Sort, Merge Sort, Matrix Multiplication, Strassen Multiplication, Polynomial Multiplication.

7. Graph Algorithms: Depth First Search, Breadth First Search, Graph connectivity, Directed acyclic graphs.

8. Special Topics on Algorithms: On-line algorithms, Dynamic Programming, Greedy algorithms, Backtracking, Branch and Bound.

9. Laboratory. Implementation of basic sorting and searching algorithms using C.

Assessment

Written Final examination 100%

Coursework (optional) 30%

Course bibliography

(One of the following):

18548861 Ανάλυση και σχεδίαση αλγορίθμων, Τύπος: Σύγγραμμα, Παπαρρίζος Κωνσταντίνος, 2010, ΤΖΙΟΛΑ, ISBN: 978-960-418-222-0

86055492 Το βιβλίο της Python, Τύπος: Σύγγραμμα, Σαμαράς Νικόλαος, Τσιπλίδης Κωνσταντίνος, 2019, Κριτική, ISBN: 978-960-586-312-8

59367744 Αλγόριθμοι, Τύπος: Σύγγραμμα, Edmonds Jeff, 2016, Κριτική, ISBN: 978-960-586-043-1

Additional material

Supplemental material and course slides.

COMPUTER SYSTEMS (AIC105) - CS-IS

Coordinator: Papadimitriou Panagiotis

Semester: 1st (Winter) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Papadimitriou Panagiotis, Mamatas Eleftherios, Souravlas Stavros, Trakatelis Georgios*

General competences

(a) To familiarize with the various computer science brunches; (b) to get a feeling of the various classes that will be taught during his/her studies.

Course content

1. Introduction. Turing model, von Neumann model, Computer components
2. Number System. Positional number systems, Nonpositional number systems
3. Storing Data. Data types, Storing numbers - text - audio - images - video
4. Operations on Data. Logic operations, Shift operations, Arithmetic operations
5. System organization. Central processing unit, memory, storing devices, peripherals, bus.
6. Algorithms. Representation of Algorithms, Basic Algorithms, Recursion.
7. Operation systems. Resource management. Computer cloud. Computer networks.
8. Security. Security fundamentals - attacks - services - techniques.
9. Lab exercises in the Linux operating system, the digital typography system Latex and in computer networks.

Assessment

Written Final examination 100%

Course bibliography

(One of the following):

50656007 Εισαγωγή στην Πληροφορική και τους Υπολογιστές, Τύπος: Σύγγραμμα, Μποζάνης Παναγιώτης Δ., 2016, ΤΖΙΟΛΑ, ISBN: 978-960-418-538-2

50656335 ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΕΠΙΣΤΗΜΗ ΤΩΝ ΥΠΟΛΟΓΙΣΤΩΝ, Τύπος: Σύγγραμμα, BEHROUZ FOROUZAN, 2015, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-660-2

Additional material

Course notes and presentations.

INTRODUCTION TO BUSINESS INFORMATICS (ISC101) - IS

Coordinator: Madas Michael

Semester: 1st (Winter) | **Course type: Compulsory IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Madas Michael*

General competences

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

• understand potential areas of application and synergies in strategy, operations and business process management through the use of Information Systems

• recognize the role and benefits, as well as the challenges of Information Systems as a means of pursuing the development of competitive advantage and operational excellence in contemporary firms and organizations

• select Information and Communication Technologies (ICT) that are compatible with relevant inter-organizational and intra-organizational problems of contemporary firms and organizations

The course aims to contribute in the development of the following general competences:

・Searching, analysis and synthesis of data and information with the use of appropriate technologies and information systems

・Decision making

・Team/group work

・Inter-disciplinary work

・Critical assessment and analysis of international case studies

Course content

The course aims to contribute in the development of skills related to the use of Information and Communication Technologies (ICT) in the management, operations and business processes of contemporary firms and organizations. It is structured into the following main thematic units:

・Introduction and Basic Concepts

・Information Systems and Career Prospects

・Roles and Types of Information Systems

・Strategy, Information Systems and Competitive Advantage

・Business Processes and Information Systems

・Collaboration through Information Systems

・Digital Marketing, Social Media and Information Systems

・Management of Information Systems

・Ethical and social aspects of Information Systems

・Case Studies (per unit)

Assessment

The overall course grading policy is based on the following main criteria:

・Final Exam: 70%

・Team-based assignment (3-4 students): 30%

The final exam includes a combination of critical assessment/judgment topics, multiple choice questions, as well as questions that are based on case studies.

Course bibliography

(One of the following):

Textbooks (one of the following):

1. McKinney Jr., E.H. and D.M. Kroenke (Επιμέλεια: Ι.Π. Ψαρομήλιγκος) (2017), Εισαγωγή στα Πληροφοριακά Συστήματα Διοίκησης: Διεργασίες, Συστήματα και Πληροφορίες, Broken Hill Publishers. (Κωδικός Βιβλίου στον Εύδοξο: 68373074)

2. Kroenke, D.M. and R.J. Boyle (Επιμέλεια: Κ. Ταραμπάνης, Ι. Πολλάλης και Α. Λαζακίδου) (2016), Πληροφοριακά Συστήματα Διοίκησης στην Πράξη, Broken Hill Publishers. (Κωδικός Βιβλίου στον Εύδοξο: 59392670)

Additional material

INTRODUCTION TO COMPUTER SCIENCE (CSC101) - CS

Coordinator: Margaritis Konstantinos

Semester: 1st (Winter) | **Course type: Compulsory CS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Margaritis Konstantinos*

General competences

After the completion of the course, students will be able to:

• distingusih between the different subjcets of Computer Science, their basic terminology, and the relations between them

• explain the relation of Computer Science with other sceintific fields

• analyse informatics applications and systems on the basis of the various Computer Science subjects

• appreciate the social and environmental impract of Computer Science applications

• Search, analysyis and synthesis of data and information, using necessary technologies

• Autonomous work

• Respect to natural environment

• Display of social, professional and moral responsibility

• Exercise of criticism and self-criticsim

• Promotion of free, creative and deductive thinking

Course content

• Historical perspective, general overview

• Computer architecture and organization, Operating systems, Networking and communication, Parallel and distributed computing

• Algorithms, Data structures, Programming languages, Sofware engineering, Data base systems

• Human computer interaction, Computer graphics and mutimedia

• Artificila intelligence, Theory of computation

• Information security, Social, environmental and professional issues

• Prospects of Computer science

Assessment

Language of teaching and assesment: Greek

Assesment methofs: Written examinations (70%) – Assesment of laboratory and theoreticak exercises (30%)

Written examinations include:

• theory

• exercicess

The assesmet criteria are published on the course web page

Course bibliography

(One of the following text books in Greek:)

13957 Η ΕΠΙΣΤΗΜΗ ΤΩΝ ΥΠΟΛΟΓΙΣΤΩΝ: ΜΙΑ ΟΛΟΚΛΗΡΩΜΕΝΗ ΠΑΡΟΥΣΙΑΣΗ, Τύπος: Σύγγραμμα, J. GLENN BROOKSHEAR, 2009, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-270-3

50656335 ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΕΠΙΣΤΗΜΗ ΤΩΝ ΥΠΟΛΟΓΙΣΤΩΝ, Τύπος: Σύγγραμμα, BEHROUZ FOROUZAN, 2015, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-660-2

Additional material

- Related scientific journals:

• Comminications of ACM

• IEEE Computer

• ACM Computing Surveys

• Proceedings of the IEEE

LINEAR ALGEBRA (AIC102) - CS-IS

Coordinator: Sifaleras Angelo

Semester: 1st (Winter) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Sifaleras Angelo*

General competences

The student is introduced to the basic concepts and methods of Linear Algebra with SageMath.

Course content

1. Matrices (Definitions – Properties of Operations – Introduction to SageMath)
2. Linear Systems
3. Vector Spaces – Applications
4. Projections – Linear transformations
5. Eigenvalues - Egeinvectors

Assessment

Written Final examination 100%

Course bibliography

(One of the following):

41960366 ΓΡΑΜΜΙΚΗ ΑΛΓΕΒΡΑ ΜΕ ΤΟ MATLAB : ΝΕΑ ΕΚΔΟΣΗ, Τύπος: Σύγγραμμα, Στεφανίδης Γιώργος, 2014, ΖΥΓΟΣ, ISBN: 978-618-5063-08-5

31174 Γραμμική άλγεβρα, Τύπος: Σύγγραμμα, Δονάτος Γεώργιος Σ., Αδάμ Μαρία Χ., 2008, Gutenberg, ISBN: 978-960-01-1193-4

Additional material

Instructor's Notes and Exercises

MANAGEMENT INFORMATION SYSTEMS (ΠΛ0113) - Core Course

Coordinator: Tampouris Efthimios

Semester: 1st (Winter) | **Course type: Core Course** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Tambouris Efthimios*

General competences

The investigation of the role and impact of information systems in the business functions, through the examination of major models of strategy and management information systems used in today's business environment. Additionally, a conceptual approach through the use of case studies, of a series of information systems applied in the "extended" or "digital enterprise", such as Enterprise Resource Planning Systems (ERP), Customer Relationship Management Systems (CRM), Supply Chain Management Systems (SCM), Decision Support Systems.

Course content

1. Business information systems in the career
2. E-Business: How businesses use information systems
3. Achieving competitive advantage with information systems
4. Information technology infrastructure
5. Achieving Operational Excellence and Customer Intimacy: Enterprise applications
6. E-Commerce: Digital Markets, Digital Goods
7. Building and managing systems
8. Improved decision making and managing knowledge
9. Ethical and social issues in information systems

Assessment

Written Final examination 100%

Course bibliography

(One of the following):

41962586 ΠΛΗΡΟΦΟΡΙΑΚΑ ΣΥΣΤΗΜΑΤΑ ΔΙΟΙΚΗΣΗΣ, Τύπος: Σύγγραμμα, KENNETH C. LAUDON, JANE P. LAUDON, 2014, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-623-7

32997790 Πληροφοριακά συστήματα διοίκησης, Τύπος: Σύγγραμμα, Wallace Patricia, 2014, Κριτική, ISBN: 978-960-218-886-6

Additional material

Instructor's Notes and Slides

MATHEMATICAL ANALYSIS (AIC104) - CS-IS

Coordinator: Hristou - Varsakelis Dimitrios

Semester: 1st (Winter) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Hristou - Varsakelis Dimitrios, Chalkidis Spyridon*

General competences

Introduction to Mathematical Analysis, Optimization, Difference Equations, Differential Equations, Basic usage of Python.

Course content

Course Content

1. Function differentiation - differentials
2. Differentiation of multivariable functions
3. Sequences, Series and Convergence
4. Taylor series and applications
5. Extrema of multivariable functions
6. Optimization with equality constraints
7. Difference Equations – equilibrium points, stability
8. Differential equations
9. Introduction to Python as a computational tool.

Assessment

Written Final examination 70%, Homeworks 30%

Course bibliography

(One of the following):

50655961 Οικονομικά Μαθηματικά, Τύπος: Σύγγραμμα, Μυλωνάς Νίκος, Γεώργιος Σαραφόπουλος, 2015, ΤΖΙΟΛΑ, ISBN: 978-960-418-564-1

41962521 ΠΡΟΣΚΛΗΣΗ ΣΤΑ ΜΑΘΗΜΑΤΙΚΑ ΟΙΚΟΝΟΜΙΚΩΝ ΚΑΙ ΔΙΟΙΚΗΤΙΚΩΝ ΕΠΙΣΤΗΜΩΝ ΤΟΜΟΣ Β', Τύπος: Σύγγραμμα, ΛΟΥΚΑΚΗΣ ΜΑΝΩΛΗΣ, 2014, "σοφία", ISBN: 978-960-6706-75-2

22767283 Μαθηματικά Οικονομικών Επιστημών, Τύπος: Σύγγραμμα, Hoy Michael, Livernois John, McKenna Chris, Stengos Thanasis, Κυρίτσης Ιωάννης (επιμ.), 2012, Gutenberg, ISBN: 978-960-01-1535-2

Additional material

Class Notes

PROCEDURAL PROGRAMMING (AIC103) - CS-IS

Coordinator: Satratzemi Maria

Semester: 1st (Winter) | **Course type: Compulsory CS-IS** | **Weekly hours: 4** | **ECTS: 5**

Instructors: *Satratzemi Maria, Chatzigeorgiou Alexandros, Xinogalos Stylianos, Sakellariou Ilias, Kaskalis Thedoros, Ampatzoglou Apostolos, Karakasidis Alexandros*

General competences

The course is an introduction to procedural programming, and problem solving techniques using the C language as a vehicle. By the end of the course the student will be able a) to understand the principles of procedural programming, b) to demonstrate the necessary skills for algorithm implementation in the C programming language, c) to develop, test and debug programs in a integrated programming environment.

Course content

1. Introduction to programming languages. Integrated Development Environments. Basic concepts of the C programming language: Types, operators and expressions. Control Flow: Conditional Statements, Looping.

2. Procedural Programming: Functions, Pointers. Data Structures: Arrays, Structures & Arrays of Structures. Input and Output: Files, Characters, Strings. Use of the programming environment Code:Blocks.

Assessment

Written Examination 55%

Mid-term Examination 30%

Compulsory Assignments 15%

Course bibliography

(One of the following):

68384925 Η ΓΛΩΣΣΑ C ΣΕ ΒΑΘΟΣ, Τύπος: Σύγγραμμα, ΝΙΚΟΣ Μ. ΧΑΤΖΗΓΙΑΝΝΑΚΗΣ, 2017, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-715-9

13767 Η ΤΕΧΝΗ ΚΑΙ ΕΠΙΣΤΗΜΗ ΤΗΣ C: ΜΙΑ ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΕΠΙΣΤΗΜΗ ΤΩΝ ΥΠΟΛΟΓΙΣΤΩΝ, Τύπος: Σύγγραμμα, ERIC S. ROBERTS, 2004, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-791-4

68370518 Εισαγωγή στη γλώσσα C, με παραδείγματα και ασκήσεις, Τύπος: Σύγγραμμα, Αλέξανδρος Καράκος, 2012, Καράκος Αλεξανδρος (Αυτοέκδοση), ISBN: 9789609340694

68383623 C: Από τη Θεωρία στην Εφαρμογή, Τύπος: Σύγγραμμα, Γ. Σ. Τσελίκης - Ν. Δ. Τσελίκας, 2016, Γ.Σ.Τσελίκης - Ν.Δ.Τσελίκας, ISBN: 978-960-93-1961-4

Additional material

Course website (http://compus.uom.gr/INF122/)

2nd Semester

COMPUTER ARCHITECTURE (AIC201) - CS-IS

Coordinator: Souravlas Stavros

Semester: 2nd (Spring) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Souravlas Stavros*

General competences

Computer Architecture deals with the logic design of the basic abstraction layers that facilitate the efficient execution of computer programs, according to current digital circuit technologies, with emphasis on processor and memory operation. Students must be able to explain the organization of a typical computer system, as well as the execution of a simple program on that system. Further, students must be able to design simple digital circuits, program in simple assembly language and estimate the performance of a simple computer system.

Course content

Introduction: Structured Computer Organization, Survey of Modern Computer Systems: Processor, Memory, Buses, I/O.

Digital Logic: Information Representation, Logic Gates and Boolean Algebra, Basic Combinatorial Circuits, Basic Sequential Circuits and Memory, Buses.

Microarchietcture: Data Paths and Memory Models, Execution of Instructions and Microisnstructions, Instruction Level Parallelism, Cache Memory, Performance Improvements.

Instruction Set Architecture: Data Types, Instruction Formats, Addressing Modes, Instruction Types, Flow Control, Assembly Language Programming.

Assessment

Optional programming assignment up to 2 additional marks

Course bibliography

(One of the following):

68374428 Ψηφιακή Σχεδίαση, 2η 'Εκδοση, Τύπος: Σύγγραμμα, Ρουμελιώτης Μάνος, Σουραβλάς Στάυρος, 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-742-3

59386815 Οργάνωση και Αρχιτεκτονική Υπολογιστών, 10η Έκδοση, Τύπος: Σύγγραμμα, Stallings William, 2016, ΤΖΙΟΛΑ, ISBN: 978-960-418-580-1

15120 Οργάνωση και αρχιτεκτονική ηλεκτρονικών υπολογιστών, Τύπος: Σύγγραμμα, Hammacher Carl,Vranesic Zvonko,Zaky Safwat, 2007, Επίκεντρο, ISBN: 978-960-458-000-2

Additional material

(http://www.etl.uom.gr/mr/index.php?mypage=archit)

DATA STRUCTURES (AIC205) - CS-IS

Coordinator: Satratzemi Maria

Semester: 2nd (Spring) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Satratzemi Maria, Koloniari Georgia, Karakasidis Alexandros*

General competences

The goal of this course is the study of data structures and it is focused in two axes: a) the recognition and the development of useful mathematic models (Abstract Data Types (ADT)) and their functions as well as the determination of categories of problems that they can solve, and b) the development of methods of representation for the objects of abstract data models and the implementation of their functions in the procedural programming language C.

Course content

1. Introduction to data structures, Abstract Data Type (ADT)
2. Stacks, basic operations, implementing Stacks with arrays and records, application of Stacks.
3. Queues, basic operations, implementing Queues with arrays and records, application of Queues.
4. Lists, basic operations, sequential storage implementation of Lists.
5. Introduction to Linked Lists, array-based implementation of Linked Lists. A pointer-based implementation of Linked Lists. A pointer-based implementation of Stacks and Queues. Application of Lists.
6. Trees, Binary Trees, basic operations. A pointer-based implementation of Binary Trees. A recursive implementation of Binary Trees. Application of Binary Trees: Huffman Codes. Full Binary Trees, Minimum/Maximum Trees, Heap.
7. Hashing, open probing, chaining, implementation of Hash table.
8. B-Trees, basic operations.
9. AVL Trees, basic operations.

Assessment

Written Examination 80%

Compulsory Assignments 20%

Course bibliography

(One of the following):

77112308 Δομές Δεδομένων με C, Τύπος: Σύγγραμμα, Νικόλαος Μισυρλής, 2017, ΕΘΝΙΚΟ ΚΑΙ ΚΑΠΟΔΙΣΤΡΙΑΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ, ISBN: 978-960-466-181-7

18548971 Δομές δεδομένων, αλγόριθμοι και εφαρμογές C++, Τύπος: Σύγγραμμα, Sahnii Sartaj, 2004, ΤΖΙΟΛΑ, ISBN: 978-960-418-030-1

59357253 Δομές Δεδομένων, 2η Έκδοση, Τύπος: Σύγγραμμα, Μποζάνης Παναγιώτης Δ., 2016, ΤΖΙΟΛΑ, ISBN: 978-960-418-594-8

50658958 Δομές Δεδομένων και Αλγόριθμοι με Αντικειμενοστρεφή Σχεδιαστικά Μορφήματα στη C++, Τύπος: Σύγγραμμα, BrunoR. Preiss, Επιστ. Επιμ. Κώστας Κοντογιάννης, 2016, Πεδίο Α.Ε., ISBN: 978-960-546-692-3

Additional material

Course website (http://compus.uom.gr/INF159/)

DATABASES (AIC202) - CS-IS

Coordinator: Evangelidis Georgios

Semester: 2nd (Spring) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Evangelidis Georgios, Koloniari Georgia*

General competences

After completing the course the student will be able to: (a) design ER-diagrams for a database based on the requirements of a specific application, (b) transform an ER-diagram to a relational schema, (c) use specialized database modeling CASE tools to achieve the above, (d) derive a relational schema via normalization, (e) implement relational schemas in commercial DBMSs (e.g., Oracle) and open-source DBMSs (e.g., MySQL), (f) master relational algebra and use SQL to manage a database and (g) understand and use CQL to query and manage a graph database.

Course content

Introduction to Databases.

The ER-model (Entity-Relationship model)

The relational model - Converting an ER diagram to a relational schema

CASE tools for database design and implementation

Relational algebra

SQL (introduction, nested, aggregate and advanced queries) QBE

Normalization (functional dependencies, BCNF, 1NF, 2NF, 3NF, 4NF)

Database connectivity - JDBC

NoSQL databases (Neo4j)

Query languages for NoSQL databases (Cypher)

Assessment

Written final examination 70%

Coursework 30%

Course bibliography

(One of the following):

22694245 Συστήματα Διαχείρισης Βάσεων Δεδομένων, 3η Έκδοση, Τύπος: Σύγγραμμα, Ramakrishnan Raghu, Gehrke Joahannes, 2012, ΤΖΙΟΛΑ, ISBN: 978-960-418-411-8

12273 Βάσεις δεδομένων Α' Τόμος, Τύπος: Σύγγραμμα, Connoly Thomas,Begg Carolyn E., 2008, Χ. Γκιούρδα & ΣΙΑ ΕΕ, ISBN: 978-960-512-499-1

Additional material

Instructor's Notes and Transparencies

DISCRETE MATHEMATICS (AIC203) - CS-IS

Coordinator: Petridou Sofia

Semester: 2nd (Spring) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Petridou Sofia*

General competences

The study of discrete objects and relationships among them. The study and implementation of computational methods in finite algebraic structures.

Course content

1. Logic and proof: Statements and Logic - Predicates and quantifiers - Proof techniques - Mathematical induction.

2. Combinatorics: sum and product rules - rules of combinatorics - binomial coefficients.

3. Discrete probability: events and probabilities - conditional probability - random variables and expected values - covariance and correlation.

4. Relations - Operations - Structures: binary relations - representation of binary relations - properties of relations - equivalence relations and partial orders - binary operations - internal operation and equivalence classes - structures - isomorphisms.

5. Modular arithmetic - Cyclic groups: Divisibility - Euclidean algorithm - residues - "exponents" - cyclic groups - computations with big integers.

6. Rings and finite fields: the problem of generators and discrete logarithm - polynomial arithmetic and applications - Algorithms for finite fields - applications.

7. Recursion: sequences - recurrence relations - computation of sums and products.

Assessment

Written Final examination 100%

Course bibliography

(One of the following):

41960368 ΔΙΑΚΡΙΤΑ ΜΑΘΗΜΑΤΙΚΑ, Τύπος: Σύγγραμμα, Στεφανίδης Γιώργος, 2015, ΖΥΓΟΣ, ISBN: 978-618-5063-07-8

13799 ΜΙΑ ΥΠΟΛΟΓΙΣΤΙΚΗ ΕΙΣΑΓΩΓΗ ΣΤΗ ΘΕΩΡΙΑ ΑΡΙΘΜΩΝ ΚΑΙ ΤΗΝ ΑΛΓΕΒΡΑ, Τύπος: Σύγγραμμα, VICTOR SHOUP, 2007, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-209-990-2

13953 ΔΙΑΚΡΙΤΑ ΜΑΘΗΜΑΤΙΚΑ ΜΕ ΕΦΑΡΜΟΓΕΣ, Τύπος: Σύγγραμμα, SUSANNA S. EPP, 2010, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-325-0

Additional material

FINANCIAL ACCOUNTING (ΠΛ0502-1) - Core Course

Coordinator: Vazakidis Athanasios

Semester: 2nd (Spring) | **Course type: Core Course** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Vazakidis Athanasios, Stavropoulos Antonios*

General competences

This course is aiming to:Enable students familiar and aware of the essentials of accounting.Enable students capable of posting entries belonged to the general or financial accounting (Journal, general ledger, balance sheets).Enable students aware of posting entries in the accounting books of a company which is classified in the second class (B' class) of book keeping using the manuscript method, and at the time capable for the accounting estimation of the value added tax (VAT).Enable students capable of posting entries in accounting books of a company which is classified in the second class of book keeping (B' class) by the use of computer' software.

Course content

Essentials of accounting, general accepted accounting principles (G.A.A.P), and accounting branches. Accounting recording methods: "Aplografiko" and Double entry system. Analysis of the Greek general chart of accounts. Valuation of inventories. Fixed assets and their depreciation. Development and analysis of the financial statements (Journal entries, general ledger, trial balance, balance sheet, profit and losses statement). Adjustments. Accounting process for the measuring, reporting and announcement of the financial annual results. Book keeping of the first and second classes of accounting classification, using manuscript method and by the use of software. Exercises related to the different classes of book keeping (mainly B' and C'). Questions and answers related to the subject of code for books and records as well as value added tax and intersection of tax records.

Assessment

Laboratory exams 35%

Final writing exams 65%

Course bibliography

(One of the following):

68401196 ΧΡΗΜΑΤΟΟΙΚΟΝΟΜΙΚΗ ΛΟΓΙΣΤΙΚΗ ΛΟΓΙΣΤΙΚΟ ΣΧΕΔΙΟ, Τύπος: Σύγγραμμα, ΒΑΖΑΚΙΔΗΣ ΑΘΑΝΑΣΙΟΣ,ΣΤΑΥΡΟΠΟΥΛΟΣ ΑΝΤΩΝΙΟΣ, ΤΣΟΠΟΓΛΟΥ ΣΤΑΥΡΟΣ, 2010, ΧΑΡΙΣ ΜΕΠΕ, ISBN: 978-960-93-2046-7

59385242 ΠΑΡΑΔΕΙΓΜΑΤΑ ΕΦΑΡΜΟΓΗΣ ΚΑΙ ΑΝΑΛΥΣΗΣ ΤΩΝ ΕΛΛΗΝΙΚΩΝ ΛΟΓΙΣΤΙΚΩΝ ΠΡΟΤΥΠΩΝ ΣΤΗΝ ΠΡΑΞΗ, Τύπος: Σύγγραμμα, ΙΩΑΝΝΗΣ Δ. ΚΑΡΑΓΙΑΝΝΗΣ, ΑΙΚΑΤΕΡΙΝΗ Δ. ΚΑΡΑΓΙΑΝΝΗ, ΔΗΜΗΤΡΙΟΣ Ι. ΚΑΡΑΓΙΑΝΝΗΣ, 2016, ΙΩΑΝΝΝΗΣ ΚΑΡΑΓΙΑΝΝΗΣ ΚΑΙ ΑΙΚΑΤΕΡΙΝΗ ΚΑΡΑΓΙΑΝΝΗ Ο.Ε., ISBN: 978-960-9781-15-2

Additional material

INTRODUCTION TO ALGORITHM ANALYSIS (ΠΛ0509-2) - Core Course

Coordinator: Satratzemi Maria

Semester: 2nd (Spring) | **Course type: Core Course** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Satratzemi Maria*

General competences

By the completion of the course the student will be acquainted with the basic mathematical concepts for algorithm analysis, will be able to compare the theoretical complexities of the algorithms and apply the basic methodology in developing efficient algorithms.

Course content

1. The concepts of computational problem and algorithm. The detailed and simplified computational model. Examples.
2. Asymptotic analysis. The asymptotic symbols O, Θ, Ω. Properties of the asymptotic symbols. The value of Algorithm analysis. The concept of algorithm complexity (Worst, best and average case)
3. Analysis of iterative algorithms
4. Analysis of recursive and divide and conquer algorithms
5. Searching. Algorithms of Sequential searching and Binary. Complexity analysis.
6. Sorting Algorithms I: Insertion sort, Selection. Complexity analysis (Worst, best and average).
7. Sorting Algorithms II: Quicksort, Mergsort, Complexity analysis (Worst, best and average). Shell sort. Complexity analysis. Comparing sorting algorithms.
8. Sorting Algorithms III: Counting sort. Radix sort. Complexity analysis
9. Limits in sorting algorithms. Medians and Order statistics.
10. Heaps: Max heap, Heapsort, MinMax heap, Double-ended heap (Deap). Complexity analysis
11. Graphs. Fundamental concepts. Breath first search, Depth first search, Topological order. Minimum Spanning Trees, Prim and Kruskal algorithm. Shortest paths, Shortest paths algorithms - Bellman-Ford, Dijkstra, Floyd. Complexity analysis.

Assessment

Written Final examination 100%

Course bibliography

(One of the following):

59359780 ΕΙΣΑΓΩΓΗ ΣΤΟΥΣ ΑΛΓΟΡΙΘΜΟΥΣ, Τύπος: Σύγγραμμα, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, 2016, ΙΤΕ-ΠΑΝΕΠΙΣΤΗΜΙΑΚΕΣ ΕΚΔΟΣΕΙΣ ΚΡΗΤΗΣ, ISBN: 978-960-524-473-6

18548861 Ανάλυση και σχεδίαση αλγορίθμων, Τύπος: Σύγγραμμα, Παπαρρίζος Κωνσταντίνος, 2010, ΤΖΙΟΛΑ, ISBN: 978-960-418-222-0

13898 ΣΧΕΔΙΑΣΜΟΣ ΑΛΓΟΡΙΘΜΩΝ, Τύπος: Σύγγραμμα, JON KLEINBERG, EVA TARDOS, 2009, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-207-9

68370088 Ανάλυση και Σχεδίαση Αλγορίθμων, 3η Έκδοση, Τύπος: Σύγγραμμα, Levitin Anavy, Μάνος Ρουμελιώτης (επιμέλεια), 2018, Τζιόλα, ISBN: 978-960-418-732-4

Additional material

Course website (http://compus.uom.gr/INF165/)

MANAGEMENT AND TECHNOLOGY (AIC204) - CS-IS

Coordinator: Fouskas Konstantinos

Semester: 2nd (Spring) | **Course type: Compulsory CS-IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Fouskas Konstantinos, Kitsios Fotios, Mastoras Thodoris*

General competences

The aim of this course is to familiarize the student with issues related to business administration, usage and application of technology in modern companies and e-business. To this end key issues related to business administration such as the basic functions and activities of the enterprise and the importance of management for business efficiency. It will additionally examine issues related to how technology is an integral part of modern business and how managers can handle it.

Course content

Definition of Management, the role of the management science for the contemporary enterprise, Internal and external environment analysis. Functional departments and their authorities. Management functions- Business functions. Evolution of the management science. Contemporary managerial approaches. The close interrelation of efficiency and effectiveness with the management functions and procedural approaches. Decision making procedures. Strategic management. Leadership theories and corporate communication. Motivation theories. Management control. Social responsibility. Technology management and innovation. E-Business. Technology usage in the modern enterprise.

Assessment

Written final examination 100%

Compulsory assignment/lab tests 20%

Course bibliography

(One of the following):

86056091 Σύγχρονη Διοίκηση, Jones Gareth R., George Jennifer M.,ISBN: 9789925575428

77107313. Εισαγωγή στο Management 2η έκδοση Έκδοση: 2/2018, Schermerhorn R. John Jr., Bachrach G. Daniel,ISBN: 9789925563098

50656013 Διοίκηση Επιχειρήσεων, 11η Έκδοση, Bateman Shell

Additional material

(http://compus.uom.gr/MT186/)

PROBABILITIES (CSC201) - CS

Coordinator: Vergidis Konstantinos

Semester: 2nd (Spring) | **Course type: Compulsory CS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Vergidis Konstantinos*

General competences

The course is an introduction to the basics of the probability theory. The aim is to prepare the student to follow other subjects that require relative knowledge, such as statistics, operations research, etc. Calculations are implemented using the free source software R.

Course content

1. Data (introduction to R, entry and presentation of data).
2. Modeling uncertainty.
3. Probability: Definitions, basic rules.
4. Random Variable: Discrete, continuous, expected value, conditional rv, independence.
5. Basic theoretical distributions.
6. Basic inequalities, LLN, CLT.
7. Stochastic Process: Definitions, Poisson process, Markov chain.

Assessment

Written examination, a four (4) question paper, very similar to those taught in the class.

Course bibliography

(One of the following):

12858980 ΒΑΣΙΚΕΣ ΑΡΧΕΣ ΘΕΩΡΙΑΣ ΠΙΘΑΝΟΤΗΤΩΝ, Τύπος: Σύγγραμμα, SHELDON ROSS, 2011, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-457-8

33114257 Εισαγωγή στις πιθανότητες με στοιχεία στατιστικής, Τύπος: Σύγγραμμα, Μπερτσεκάς Δ. - Τσιτσικλής Γ., 2013, ΤΖΙΟΛΑ, ISBN: 978-960-418-398-2

Additional material

Instructor's notes and slides, see http://compus.uom.gr/INF267

PROBABILITY AND STATISTICS (ISC201) - IS

Coordinator: Nikolaidis Ioannis

Semester: 2nd (Spring) | **Course type: Compulsory IS** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Nikolaidis Ioannis*

General competences

The purpose of this course is for the students to get to know and familiarize themselves with some additional issues of Statistics (apart from those that they learnt about in Statistics I), which are absolutely necessary in many research and non-research projects. The students are introduced not only to Descriptive Statistics but also to Inferential Statistics (confidence intervals, hypotheses testing etc.) at first by theory and then through exercises, in order to be able to implement their knowledge in practice.

Course content

Terminology: population, sample, random variable etc.

Data collection: from the entire population or samples. Graphical and numerical presentation of data. Frequency distribution. Measures of Central Tendency and Dispersion.

Sampling distributions. Central limit theorem. Point estimation. Properties of estimators. Confidence interval estimation. Choice of sample size.

Hypotheses testing. Testing for goodness of fit.

Regression-correlation

Assessment

100% final written exam, 5% for each project.

Course bibliography

(One of the following):

50657217 ΕΦΑΡΜΟΣΜΕΝΕΣ ΠΙΘΑΝΟΤΗΤΕΣ ΚΑΙ ΣΤΑΤΙΣΤΙΚΗ, Τύπος: Σύγγραμμα, ΚΟΥΤΡΟΥΒΕΛΗΣ ΙΩΑΝΝΗΣ, 2015, GOTSIS, ISBN: 978-960-9427-47-0

11365 Στατιστική, Τύπος: Σύγγραμμα, Ψωινός Δημήτριος Π., 1999, Ζήτη, ISBN: 960-431-561-7

59377478 Στατιστική Μέθοδοι Ανάλυσης για Επιχειρηματικές Αποφάσεις (4η έκδοση), Τύπος: Σύγγραμμα, Ιωάννης Χαλικιάς, 2017, Εκδοτικός Οίκος Rosili, ISBN: 978-618-5131-20-3

Additional material

Probability and Statistics in Engineering and Management Science. W. W. Hines, D. C. Montgomery, Ed. Wiley, 1990.

3rd Semester

COMPUTER ARCHITECTURE (ΠΛ0304-1) - AI-TM

Coordinator: Souravlas Stavros

Semester: 3rd (Winter) | **Course type: Compulsory AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Souravlas Stavros*

General competences

Computer Architecture deals with the logic design of the basic abstraction layers that facilitate the efficient execution of computer programs, according to current digital circuit technologies, with emphasis on processor and memory operation. Students must be able to explain the organization of a typical computer system, as well as the execution of a simple program on that system. Further, students must be able to design simple digital circuits, program in simple assembly language and estimate the performance of a simple computer system.

Course content

Introduction: Structured Computer Organization, Survey of Modern Computer Systems: Processor, Memory, Buses, I/O.

Digital Logic: Information Representation, Logic Gates and Boolean Algebra, Basic Combinatorial Circuits, Basic Sequential Circuits and Memory, Buses.

Microarchietcture: Data Paths and Memory Models, Execution of Instructions and Microisnstructions, Instruction Level Parallelism, Cache Memory, Performance Improvements.

Instruction Set Architecture: Data Types, Instruction Formats, Addressing Modes, Instruction Types, Flow Control, Assembly Language Programming.

Assessment

Optional programming assignment up to 2 additional marks

Course bibliography

(One of the following):

68374428 Ψηφιακή Σχεδίαση, 2η 'Εκδοση, Τύπος: Σύγγραμμα, Ρουμελιώτης Μάνος, Σουραβλάς Στάυρος, 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-742-3

59386815 Οργάνωση και Αρχιτεκτονική Υπολογιστών, 10η Έκδοση, Τύπος: Σύγγραμμα, Stallings William, 2016, ΤΖΙΟΛΑ, ISBN: 978-960-418-580-1

15120 Οργάνωση και αρχιτεκτονική ηλεκτρονικών υπολογιστών, Τύπος: Σύγγραμμα, Hammacher Carl,Vranesic Zvonko,Zaky Safwat, 2007, Επίκεντρο, ISBN: 978-960-458-000-2

Additional material

(http://www.etl.uom.gr/mr/index.php?mypage=archit)

COMPUTER NETWORKS (ΠΛ0503-2) - TM

Coordinator: Fouliras Panayotis

Semester: 3rd (Winter) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Fouliras Panayotis*

General competences

First, there is an introduction into the use of networks and the concepts of several network layers. Covered next are topics of computer network analysis and design, including aspects such as network structures and architectures OSI and TCP/IP, network examples, topologies, the physical layer, data connection layer, protocol analysis, sliding window protocols, ALOHA and CSMA/CD protocols, network layer, routing algorithms, flow control, network congestion, transport layer. This course also features major Internet applications (DNS, E-mail, WWW, etc.). Internet protocols are studied in the laboratory, too, with the aid of appropriate software.

Course content

Assessment

Written final examination 80%

Mandatory Coursework 20%

Course bibliography

(One of the following):

77106973 Δικτύωση Υπολογιστών, 7η Έκδοση, 2018, J. F. Kurose, K. W. Ross, σε μετάφραση από εκδοτικό οίκο «Χ. Γκιούρδας & ΣΙΑ ΕΕ»

12534026 Δίκτυα Υπολογιστών, 5η Αμερικανική, 2011, A. S. TANENBAUM, D. WETHERALL, σε μετάφραση από εκδοτικό οίκο «ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ»

Additional material

DATABASES I (ΠΛ0501-1) - AI-TM

Coordinator: Evangelidis Georgios

Semester: 3rd (Winter) | **Course type: Compulsory AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Evangelidis Georgios, Koloniari Georgia, Karakasidis Alexandros*

General competences

The student will be able to: (a) design ER-diagrams for a database based on the requirements of a specific application, (b) transform an ER-diagram to a relational schema, (c) use specialized database modeling CASE tools to achieve the above, (d) derive a relational schema via normalization, (e) implement relational schemas in commercial DBMSs (e.g., Oracle) and open-source DBMSs (e.g., MySQL), (f) master relational algebra and use SQL to manage a database.

Course content

Introduction to Databases.

The ER-model (Entity-Relationship model)

The relational model

Normalization (1NF, 2NF, 3NF)

Relational algebra

SQL introduction, QBE

SQL (nested queries)

SQL (aggregate queries)

SQL (advanced queries)

Normalization (4NF and 5NF)

Assessment

Written final examination 70%

Coursework 30%

Course bibliography

(One of the following):

22694245 Συστήματα Διαχείρισης Βάσεων Δεδομένων, 3η Έκδοση, Τύπος: Σύγγραμμα, Ramakrishnan Raghu, Gehrke Joahannes, 2012, ΤΖΙΟΛΑ, ISBN: 978-960-418-411-8

12273 Βάσεις δεδομένων Α' Τόμος, Τύπος: Σύγγραμμα, Connoly Thomas,Begg Carolyn E., 2008, Χ. Γκιούρδα & ΣΙΑ ΕΕ, ISBN: 978-960-512-499-1

Additional material

Instructor's Notes and Transparencies

DIGITAL ECONOMICS (ΠΛ0316) - AI

Coordinator: Stiakakis Emmanuil

Semester: 3rd (Winter) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Stiakakis Emmanuil*

General competences

To investigate the characteristics of the digital economy and to comprehend the way in which these characteristics, related to each other, contribute to the improvement of the micro- and macro-economic measures.

Course content

Introduction to the digital economy (From industrial economics to digital economics, Differences between the old and the new economy, Rules and characteristics of the new economy),

Productivity and new technologies (Productivity change measurement, The "productivity paradox", Integration of the digital goods into the productivity measurement),

Pricing policies in the Internet (Factors that influence pricing in the Internet, Internet pricing types, E-auctions, Pricing of the Internet services),

Information & Communication Technologies and digital divide (Determinants of the digital divide, Digital divide types, Measurement of the digital divide),

Economic consequences of the digital technologies on the environment (Analysis of the economic consequences of e-waste, Environmental pollution by the disposal and recycling of e-waste, Estimation methods of the e-waste produced quantity)

Assessment

Written examination 70%

Compulsory assignment 30%

Course bibliography

(One of the following):

32998108 ΨΗΦΙΑΚΗ ΟΙΚΟΝΟΜΙΚΗ, Τύπος: Σύγγραμμα, ΣΤΕΙΑΚΑΚΗΣ ΕΜΜΑΝΟΥΗΛ, 2013, ΑΝΙΚΟΥΛΑ, ISBN: 978-960-516-051-7

13763 Η ΔΙΟΙΚΗΣΗ ΚΑΙ ΑΝΑΠΤΥΞΗ ΣΤΗ ΝΕΑ ΟΙΚΟΝΟΜΙΑ, Τύπος: Σύγγραμμα, ΒΑΣΙΛΗΣ ΜΑΣΟΥΛΑΣ, 2008, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-126-3

Additional material

FINANCIAL MANAGEMENT (ΠΛ0502) - AI

Coordinator: Dasilas Apostolos

Semester: 3rd (Winter) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Dasilas Apostolos*

General competences

Students are introduced to the following concepts and practices in Finance:

1. Understanding the basic concepts in Financial Analysis and Management
2. Use of financial analysis tools in firms business operations.
3. Decision making based on the results of the financial analysis.
4. Competence in using spreadsheet type of software to solve problems in finance.

Course content

1. Financial environment
2. Financial system
3. Financial statement analysis
4. Financial ratios
5. Depreciation methods
6. Sources and uses of funds
7. Time value of money
8. Security valuation
9. Cost of capital
10. Capital budgeting
11. Investment decision methods
12. Break-even analysis

Assessment

Written final examination: 100%

Course bibliography

(One of the following):

86054049 Χρηματοοικονομική Διοίκηση: Επενδυτικές και Χρηματοδοτικές Αποφάσεις, Τύπος: Σύγγραμμα, Νούλας Αθανάσιος, 2019 ISBN: 978-960-418-319-7

86056078 Χρηματοοικονομική Διοίκηση-Από τη Θεωρία στην Πράξη,Τύπος: Σύγγραμμα,Brigham F. Eugene, Ehrhardt C. Michael, 2019 ISBN: 9789925575442 68389105 Χρηματοοικονομική διαχείριση, Τύπος: Σύγγραμμα, Titman S., Martin J, Keown A., 2015, ISBN: 978-960-02-3029-1

Additional material

http://compus.uom.gr/INF110

MANAGEMENT AND TECHNOLOGY (ΠΛ0317) - TM

Coordinator: Fouskas Konstantinos

Semester: 3rd (Winter) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Fouskas Konstantinos*

General competences

The aim of this course is to familiarize the student with issues related to business administration, usage and application of technology in modern companies and e-business. To this end key issues related to business administration such as the basic functions and activities of the enterprise and the importance of management for business efficiency. It will additionally examine issues related to how technology is an integral part of modern business and how managers can handle it.

Course content

Definition of Management, the role of the management science for the contemporary enterprise, Internal and external environment analysis. Functional departments and their authorities. Management functions- Business functions. Evolution of the management science. Contemporary managerial approaches. The close interrelation of efficiency and effectiveness with the management functions and procedural approaches. Decision making procedures. Strategic management. Leadership theories and corporate communication. Motivation theories. Management control. Social responsibility. Technology management and innovation. E-Business. Technology usage in the modern enterprise.

Assessment

Written final examination 70%

Compulsory assignment/lab tests 30%

Course bibliography

(One of the following):

86056091 Σύγχρονη Διοίκηση, Jones Gareth R., George Jennifer M.,ISBN: 9789925575428

77107313. Εισαγωγή στο Management 2η έκδοση Έκδοση: 2/2018, Schermerhorn R. John Jr., Bachrach G. Daniel,ISBN: 9789925563098

50656013 Διοίκηση Επιχειρήσεων, 11η Έκδοση, Bateman Shell

Additional material

(http://compus.uom.gr/MT186/)

OBJECT-ORIENTED PROGRAMMING (ΠΛ0401) - AI-TM

Coordinator: Chatzigeorgiou Alexander

Semester: 3rd (Winter) | **Course type: Compulsory AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Chatzigeorgiou Alexander, Xinogalos Stylianos, Ampatzoglou Apostolos*

General competences

To understand the object-oriented way of thinking as a way to model and solve problems. To learn the basic elements of the object-oriented programming language Java.

Course content

Introduction to the object-oriented way of thinking. Objects and Classes. Introduction to the Java programming language: Language features, variables, data types and expressions. Control statements. Using Java libraries. Design of classes and construction of objects. Associations between classes. The concept of reference. Inheritance and Polymorphism. Applets and Applications. Graphical User Interface and event handling. Exceptions. Object-oriented analysis and design with UML.

Assessment

Written examination (Lab) 100%

Optional programming assignment up to 2 additional marks

Course bibliography

(One of the following):

50655978 JAVA, 7η Έκδοση, Τύπος: Σύγγραμμα, Savitch Walter, 2015, ΤΖΙΟΛΑ, ISBN: 978-960-418-501-6

77108692 ΑΝΤΙΚΕΙΜΕΝΟΣΤΡΕΦΗΣ ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΣ ΣΕ JAVA: ΜΙΑ ΠΡΑΚΤΙΚΗ ΕΙΣΑΓΩΓΗ ΜΕ ΧΡΗΣΗ ΤΟΥ BLUEJ, Τύπος: Σύγγραμμα, DAVID J. BARNES, MICHAEL KOLLING, 2018, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-820-0

13958 Η ΤΕΧΝΗ ΚΑΙ ΕΠΙΣΤΗΜΗ ΤΗΣ JAVA: ΜΙΑ ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΕΠΙΣΤΗΜΗ ΤΩΝ ΥΠΟΛΟΓΙΣΤΩΝ, Τύπος: Σύγγραμμα, ERIC S. ROBERTS, 2008, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-164-5

13549 JAVA ΜΕ UML: ΑΝΤΙΚΕΙΜΕΝΟΣΤΡΕΦΗΣ ΣΧΕΔΙΑΣΗ ΚΑΙ ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΣ, Τύπος: Σύγγραμμα, ELSE LERVIK, VEGARD B. HAVDAL, 2004, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-802-3

Additional material

STATISTICS II (ΠΛ0202) - AI

Coordinator: Nikolaidis Ioannis

Semester: 3rd (Winter) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Nikolaidis Ioannis*

General competences

The purpose of this course is for the students to get to know and familiarize themselves with some additional issues of Statistics (apart from those that they learnt about in Statistics I), which are absolutely necessary in many research and non-research projects. The students are introduced not only to Descriptive Statistics but also to Inferential Statistics (confidence intervals, hypotheses testing etc.) at first by theory and then through exercises, in order to be able to implement their knowledge in practice.

Course content

Terminology: population, sample, random variable etc.

Data collection: from the entire population or samples. Graphical and numerical presentation of data. Frequency distribution. Measures of Central Tendency and Dispersion.

Sampling distributions. Central limit theorem. Point estimation. Properties of estimators. Confidence interval estimation. Choice of sample size.

Hypotheses testing. Testing for goodness of fit.

Regression-correlation

Assessment

100% final written exam, 5% for each project.

Course bibliography

(One of the following):

50657217 ΕΦΑΡΜΟΣΜΕΝΕΣ ΠΙΘΑΝΟΤΗΤΕΣ ΚΑΙ ΣΤΑΤΙΣΤΙΚΗ, Τύπος: Σύγγραμμα, ΚΟΥΤΡΟΥΒΕΛΗΣ ΙΩΑΝΝΗΣ, 2015, GOTSIS, ISBN: 978-960-9427-47-0

11365 Στατιστική, Τύπος: Σύγγραμμα, Ψωινός Δημήτριος Π., 1999, Ζήτη, ISBN: 960-431-561-7

59377478 Στατιστική Μέθοδοι Ανάλυσης για Επιχειρηματικές Αποφάσεις (4η έκδοση), Τύπος: Σύγγραμμα, Ιωάννης Χαλικιάς, 2017, Εκδοτικός Οίκος Rosili, ISBN: 978-618-5131-20-3

Additional material

Probability and Statistics in Engineering and Management Science. W. W. Hines, D. C. Montgomery, Ed. Wiley, 1990.

WEB TECHNOLOGIES (ΠΛ0318) - TM

Coordinator: Kaskalis Theodoros

Semester: 3rd (Winter) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Kaskalis Theodoros*

General competences

The subject aims in developing dynamic web pages and web applications, focusing on the "client-side" perspective. Emphasis is given in markup and scripting languages (HTML, CSS, Javascript) and it expands on aspects of networking programming

Course content

Client, server technologies. Client-side orientation: HTML, CSS,Javascript. Web site and web content publishing. HTML page structure,elements, semantic markup. Content vs presentation. CSS evolution and present state. Selectors, properties, pseudo-classes, pseudo-elements.Inheritance, layout, ordering, compatibility. JavaScript programming.Primitive values, objects, functions, closures. Document Object Model(DOM), events. AJAX, JSON.

Assessment

Course bibliography

(One of the following):

50658790 Μάθετε HTML 5, CSS και JavaScript Όλα σε Ένα, 2η Έκδ., Julie C. Meloni

12481635 Πλήρες Εγχειρίδιο της HTML 5 & CSS, 6ή Έκδοση, Lemay Laura, Colburn Rafe

Additional material

(http://compus.uom.gr/MT177/)

4th Semester

COMPUTER NETWORKS (ΠΛ0503-2) - AI

Coordinator: Fouliras Panayotis

Semester: 4th (Spring) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Fouliras Panayotis*

General competences

First, there is an introduction into the use of networks and the concepts of several network layers. Covered next are topics of computer network analysis and design, including aspects such as network structures and architectures OSI and TCP/IP, network examples, topologies, the physical layer, data connection layer, protocol analysis, sliding window protocols, ALOHA and CSMA/CD protocols, network layer, routing algorithms, flow control, network congestion, transport layer. This course also features major Internet applications (DNS, E-mail, WWW, etc.). Internet protocols are studied in the laboratory, too, with the aid of appropriate software.

Course content

Assessment

Written final examination 80%

Mandatory Coursework 20%

Course bibliography

(One of the following):

77106973 Δικτύωση Υπολογιστών, 7η Έκδοση, 2018, J. F. Kurose, K. W. Ross, σε μετάφραση από εκδοτικό οίκο «Χ. Γκιούρδας & ΣΙΑ ΕΕ»

12534026 Δίκτυα Υπολογιστών, 5η Αμερικανική, 2011, A. S. TANENBAUM, D. WETHERALL, σε μετάφραση από εκδοτικό οίκο «ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ»

Additional material

DATABASES II (ΠΛ0601) - AI

Coordinator: Evangelidis Georgios

Semester: 4th (Spring) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Evangelidis Georgios*

General competences

The student will be able to: (a) distinguish the components of a DBMS, (b) know the available file organizations and index types, (c) understand the importance of query optimization, (d) understand the notion of transaction and the DBMS recovery procedure, (e) connect and submit SQL queries to a DMBS when programming using a 3rd generation language.

Course content

1. DBMS Architecture
2. Storing Data: Disks and Files
3. File Structures and Indexes
4. Tree IndexesHash-based Indexes
5. External Sorting
6. Relational Operators
7. Query Optimization
8. Transaction Management/Concurrency Control
9. Recovery
10. DBMS Connectivity- PHP and MySQL

Assessment

Written Final examination 80%

Coursework 20%

Course bibliography

(One of the following):

22683637 Θεμελιώδεις αρχές συστημάτων βάσεων δεδομένων, Τύπος: Σύγγραμμα, Elmasri Ramez,Navathe Shamkant B., 2012, ΔΙΑΥΛΟΣ, ISBN: 978-960-531-281-7

12535833 Συστήματα Βάσεων Δεδομένων 6η Έκδοση, Τύπος: Σύγγραμμα, Abraham Silberschatz,Henry F. Korth,S. Sudarshan, 2011, Α. Γκιούρδα & ΣΙΑ ΟΕ, ISBN: 978-960-512-623-0

Additional material

Instructor's Notes and Slides

DIGITAL TELECOMMUNICATIONS SYSTEMS (ΠΛ0526) - TM

Coordinator: Psannis Konstantinos

Semester: 4th (Spring) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Psannis Konstantinos*

General competences

Principles of Digital Communications/ Communication theory

Course content

Fourier analysis,Time/frequency representation of digital signals. Baseband Data Transmission,, Sampling Process, Voice/video Communication, Pulse Amplitude Modulation (PAM), Pulse Code Modulation, Shannon Limit , Modulation, Performance Parameters of Coding and Modulation Scheme , Power Limited and Bandwidth-Limited Channel, Nyquist Bandwidth, OSI Model, Data Communication Services, Multiplexing, Transmission Media, Transmission Impairments, Communication Networks, Information Theory/quantitative theory of information and its applications to reliable, efficient communication systems, Algorithms for Communications Systems and their Applications

Assessment

Written final examination / assignment/Virtual labs

Course bibliography

(One of the following):

18548860 Αρχές τηλεπικοινωνιακών συστήματων, Τύπος: Σύγγραμμα, Taub Herbert 1918-,Schilling Donald L., 2006, ΤΖΙΟΛΑ, ISBN: 978-960-418-061-5

77107676 Επικοινωνίες υπολογιστών και δεδομένων, 10η Έκδοση, Τύπος: Σύγγραμμα, Stallings William, Κατσαβούνης Στέφανος (επιμέλεια), 2018, ΤΖΙΟΛΑ, ISBN: 978-960-418-814-7

18548741 Ψηφιακές επικοινωνίες, Τύπος: Σύγγραμμα, Rice Michael, 2009, ΤΖΙΟΛΑ, ISBN: 978-960-418-176-6

3235 ΑΛΓΟΡΙΘΜΟΙ & ΕΦΑΡΜΟΓΕΣ ΣΥΣΤΗΜΑΤΩΝ ΕΠΙΚΟΙΝΩΝΙΩΝ ΤΟΜΟΣ 1:ΣΗΜΑΤΑ & ΣΥΣΤΗΜΑΤΑ, Τύπος: Σύγγραμμα, NEVIO BENVENUTO,GIOVANNI CHERUBINI, 2004, ΕΚΔΟΣΕΙΣ ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΠΑΤΡΩΝ, ISBN: 960-530-065-5

68369851 Τηλεπικοινωνιακά Συστήματα, 4η Έκδοση, Τύπος: Σύγγραμμα, Καραγιαννίδης Γεώργιος, Παππή Κοραλία, 2017, Τζιόλα, ISBN: 978-960-418-675-4

18549058 Εισαγωγή στις Τηλεπικοινωνίες, Τύπος: Σύγγραμμα, Κωττής Παναγιώτης Γ., 2011, ΤΖΙΟΛΑ, ISBN: 978-960-418-362-3

50657744 ΣΥΣΤΗΜΑΤΑ ΤΗΛΕΠΙΚΟΙΝΩΝΙΩΝ, Τύπος: Σύγγραμμα, Proakis/Salehi, 2015, Fountas, ISBN: 9789603307631

12866698 Digital Communications, Τύπος: Σύγγραμμα, John Proakis, Massoud Salehi, 2008, McGraw Hill, ISBN: 9780071263788

14869 Ψηφιακή Ανάλυση Σήματος, Τύπος: Σύγγραμμα, Proakis J, Manolakis D., 2010, Ίων, ISBN: 978-960-411-715-4

33197231 Ψηφιακά Συστήματα Επικοινωνιών, Τύπος: Σύγγραμμα, Simon Haykin, 2014, Παπασωτηρίου, ISBN: 978-960-491-088-5

Additional material

ebooks, papers, Demonstrations, Virtual Labs , Experiments (Labs)

HUMAN COMPUTER INTERACTION AND GRAPHICS (ΠΛ0420) - AI

Coordinator: Kokkinidis Konstantinos-Iraklis

Semester: **4th** (Spring) | **Course type:** **Compulsory AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Kokkinidis Konstantinos-Iraklis*

General competences

Course content

Assessment

Written examination 100%

Course bibliography

(One of the following):

12172 Εισαγωγή στην επικοινωνία ανθρώπου-υπολογιστή, Τύπος: Σύγγραμμα, Αβούρης Νικόλαος, 2000, Δίαυλος, ISBN: 978-960-531-098-1

12304 Επικοινωνία ανθρώπου - υπολογιστή, 3ή Έκδοση, Τύπος: Σύγγραμμα, Dix Alan J.,Finlay Janet E.,Abowd Gregory D.,Beale Russell, 2007, Α.Γκιούρδα & ΣΙΑ ΟΕ, ISBN: 960-512-503-X

Additional material

Instructor's Notes and Slides

INTERNET TECHNOLOGIES (ΠΛ0424) - TM

Coordinator: Kaskalis Theodoros

Semester: 4th (Spring) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Kaskalis Theodoros, Xinogalos Stylianos*

General competences

Developing dynamic web pages and web applications, focusing on the "server-side" perspective. Emphasis is given in web server programs' management, in scripting languages (PHP) and in Database Management Systems. Combining the above leads to dynamic web sites and web applications.

Course content

The notion of the server and its services. Web server installation and management (apache). Activating dynamic features. Introduction to server-side scripting languages with emphasis on PHP. Basic data structures. Data storing and retrieving. Using tables. String handling. Code reuse and function syntax. Object orientation. Interfacing with the file system and the server. Database Management System (DBMS) installation and management for web services (MySQL). Design and creation of a network data base. Accessing data through PHP. E-commerce web site example functioning. Security issues. Identity check and secure transactions through PHP and MySQL. Expanding towards XML and AJAX. Comparison with competitive technologies in web servicing, scripting, DBMS.

Assessment

Course bibliography

(One of the following):

13690 ΕΙΣΑΓΩΓΗ ΣΤΙΣ PHP 6 ΚΑΙ MYSQL 5 ΜΕ ΕΙΚΟΝΕΣ, Τύπος: Σύγγραμμα, LARRY ULLMAN, 2009, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-250-5

68387584 Ανάπτυξη Web Εφαρμογών με PHP και MySQL, 5η εκδ., Τύπος: Σύγγραμμα, Thomson Laura, Welling Luke, 2017, Χ. ΓΚΙΟΥΡΔΑ & ΣΙΑ ΕΕ, ISBN: 978-960-512-7015

Additional material

(http://compus.uom.gr/MT120)

LINEAR AND NETWORK PROGRAMMING (ΠΛ0313-2) - AI

Coordinator: Samaras Nikolaos

Semester: **4th** (Spring) | **Course type:** **Compulsory AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Samaras Nikolaos, Sifaleras Angelo*

General competences

The course aims to introduce the students to the algorithms for the solution of two of the most applied problems; The Linear and Network problems, as also it's applications in Informatics and in the scientific method for decision making in complicated economical and managerial decisions.

Course content

Introduction - Basic concepts. Historical review, Definitions and concepts of Linear and Network optimization, Applications of the linear problem formulation, Description of the linear problem, Linear problem formulations (normal, standard, general), Transformation between different formulations, Storage schemes of graphs and trees, Node - node adjacency matrix, Node - arc adjacency matrix, Linked lists.Network flow problems and transformations. Minimum Cost Network Flow Problems, (MCNF), Balanced and not-balanced MCNF, Special MCNF cases, Network flow problems' transformations, MCNF optimality conditions.Geometrical solution of the linear problem. Improving directions, Geometrical solution in the space of variables, Invert matrix properties, Methods of invert matrix calculation for linear optimization problems, Eta-matrices usage.Simplex type algorithms. General description of simplex type algorithms, Methodology of simplex type algorithms, The revised primal simplex algorithm, simplex algorithm's justification, Analysis of different pivoting rules, Solution of general linear problems, (two phase algorithm and big M algorithm), Implementation of simplex type algorithms.Duality theory. Relations between primal and dual linear problem, Transforming primal to dual, Weak duality theorem, Strong duality theorem, Theorem of complementarity slackness, The revised dual simplex algorithm.Minimum spanning tree algorithms. Kruscal algorithm, Prim algorithm.Sensitivity analysis. Classical sensitivity analysis, Changes in the cost variables, Changes in the right hand side.

Assessment

Written final examination 100%

Course bibliography

(One of the following):

1827 ΔΙΚΤΥΑΚΗ ΒΕΛΤΙΣΤΟΠΟΙΗΣΗ, Τύπος: Σύγγραμμα, ΠΑΠΑΡΡΙΖΟΣ Κ., ΣΑΜΑΡΑΣ Ν., ΣΙΦΑΛΕΡΑΣ Α., 2009, ΖΥΓΟΣ, ISBN: 978-960-8065-68-0

1775 ΓΡΑΜΜΙΚΟΣ ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΣ, Μια Προσέγγιση με Matlab, Τύπος: Σύγγραμμα, ΠΑΠΑΡΡΙΖΟΣ ΚΩΝΣΤΑΝΤΙΝΟΣ, 2009, ΖΥΓΟΣ, ISBN: 978-960-8065-67-3

12518837 ΠΟΣΟΤΙΚΗ ΑΝΑΛΥΣΗ ΓΙΑ ΤΗ ΛΗΨΗ ΔΙΟΙΚΗΤΙΚΩΝ ΑΠΟΦΑΣΕΩΝ ΤΟΜΟΣ Α΄, Τύπος: Σύγγραμμα, Τόμος: Α΄, ΟΙΚΟΝΟΜΟΥ ΓΕΩΡΓΙΟΣ, ΓΕΩΡΓΙΟΥ ΑΝΔΡΕΑΣ, 2011, ΕΥΓΕΝΙΑ ΜΠΕΝΟΥ, ISBN: 978-960-359-102-3

691 ΓΡΑΜΜΙΚΟΣ ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΣ, Τύπος: Σύγγραμμα, ΜΑΝΩΛΗΣ ΛΟΥΚΑΚΗΣ, 2010, Εκδόσεις "σοφία", ISBN: 978-960-87438-8-5

Additional material

Supplemental material and course slides.

OPERATING SYSTEMS (ΠΛ0404) - AI-TM

Coordinator: Roumeliotis Manos

Semester: 4th (Spring) | **Course type: Compulsory AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Roumeliotis Manos*

General competences

Analysis of the component architecture, operating principles, design issues, programming and usage interfaces, as well as algorithmic subjects of modern operating systems. Students should be able to explain the structure and functioning of a modern operating system, communication of operating system with computer hardware, control of file systems and disks, as well as input/output devices. Further, they should be able to explain the management of processes and threads, process scheduling, inter-process communication and deadlock avoidance, memory management with paging and segmentation. Finally the student should be able to use the programming and usage interfaces.

Course content

Types, structure and evolution of operating systems.Programming and usage interfaces. Hardware interfce.Processor management, process scheduling, interprocess communication, deadlocks.Memory management, virtual memory, paging, segementation.File systems, disk management.Input/output devices management.

Assessment

Course bibliography

(One of the following):

68374433 Λειτουργικά Συστήματα, 9η Έκδοση, Τύπος: Σύγγραμμα, Stallings William, 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-715-7

13884 ΣΥΓΧΡΟΝΑ ΛΕΙΤΟΥΡΓΙΚΑ ΣΥΣΤΗΜΑΤΑ, Τύπος: Σύγγραμμα, ANDREW S. TANENBAUM, 2009, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-200-0

Additional material

OPERATIONS RESEARCH (ΠΛ0814-1) - TM

Coordinator: Hristou - Varsakelis Dimitrios

Semester: 4th (Spring) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Hristou - Varsakelis Dimitrios*

General competences

Operations Research (OR) concerns the use of mathematical models, techniques and algorithms for the purposes of making optimal decisions in problems concerning engineering, economics, management, bioinformatics and many other areas. The course aims to help students a)understand the fundamental principles and results available for some of the most important classes of optimization problems and b) formulate and solve optimization problems using analytical and computational methods.

Course content

1. Linear programming
2. Nonlinear programming
3. Laboratory exercises using SageMath

Assessment

Written final examination (70%), Homework assignments (30%)

Course bibliography

(One of the following):

59386820 Εισαγωγή στην Επιχειρησιακή Έρευνα, 10η Έκδοση, Τύπος: Σύγγραμμα, Hillier Frederick S., Lieberman Gerald J., Διαμαντίδης Αλέξανδρος (επιμέλεια), 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-604-4

59415056 Εισαγωγή στην Επιχειρησιακή Έρευνα, 10η Έκδοση, Τύπος: Σύγγραμμα, Taha A. Hamdy, 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-691-4

Additional material

Class Notes

PROBABILITY AND STATISTICS (ΠΛ0423) - TM

Coordinator: Nikolaidis Ioannis

Semester: **4th** (Spring) | **Course type:** **Compulsory TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Nikolaidis Ioannis*

General competences

The purpose of this course is for the students to get to know and familiarize themselves with some additional issues of Statistics (apart from those that they learnt about in Statistics I), which are absolutely necessary in many research and non-research projects. The students are introduced not only to Descriptive Statistics but also to Inferential Statistics (confidence intervals, hypotheses testing etc.) at first by theory and then through exercises, in order to be able to implement their knowledge in practice.

Course content

Terminology: population, sample, random variable etc.

Data collection: from the entire population or samples. Graphical and numerical presentation of data. Frequency distribution. Measures of Central Tendency and Dispersion.

Sampling distributions. Central limit theorem. Point estimation. Properties of estimators. Confidence interval estimation. Choice of sample size.

Hypotheses testing. Testing for goodness of fit.

Regression-correlation

Assessment

100% final written exam, 5% for each project.

Course bibliography

(One of the following):

50657217 ΕΦΑΡΜΟΣΜΕΝΕΣ ΠΙΘΑΝΟΤΗΤΕΣ ΚΑΙ ΣΤΑΤΙΣΤΙΚΗ, Τύπος: Σύγγραμμα, ΚΟΥΤΡΟΥΒΕΛΗΣ ΙΩΑΝΝΗΣ, 2015, GOTSIS, ISBN: 978-960-9427-47-0

11365 Στατιστική, Τύπος: Σύγγραμμα, Ψωινός Δημήτριος Π., 1999, Ζήτη, ISBN: 960-431-561-7

59377478 Στατιστική Μέθοδοι Ανάλυσης για Επιχειρηματικές Αποφάσεις (4η έκδοση), Τύπος: Σύγγραμμα, Ιωάννης Χαλικιάς, 2017, Εκδοτικός Οίκος Rosili, ISBN: 978-618-5131-20-3

Additional material

Probability and Statistics in Engineering and Management Science. W. W. Hines, D. C. Montgomery, Ed. Wiley, 1990.

PRODUCTION AND OPERATIONS MANAGEMENT (ΠΛ0836) - TM

Coordinator: Nikolaidis Ioannis

Semester: 4th (Spring) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Nikolaidis Ioannis*

General competences

The purpose of this course is for the students to acquire basic knowledge regarding production systems and various types of production processes, as well as their relation with products' and markets' characteristics. The presentation of various approaches of plant layout helps the students understand any production system and the decision making system that is related with it. Besides, the course aims in the comprehension of administrative decisions of production planning and control, and their relation with the business strategy. Finally, in the framework of the specific course we examine the systems of efficiency measurement which constitute basic element of production improvement and decisive factor of production incorporation in the business strategy.

Course content

1. Introduction – Operations
2. Strategic Management
3. Product development
4. Work organization
5. Design of the administrative organization
6. Capacity planning
7. Production planning (transportation modelling)
8. Visits – Guest lectures

Assessment

100% final written exam, 5% for each design project (that students work either during the course or at home).

Course bibliography

(One of the following):

11513 Διοίκηση παραγωγικών συστημάτων, Τύπος: Σύγγραμμα, Δημητριάδης Σωτήριος Γ.,Μιχιώτης Αθανάσιος Ν., 2007, Κριτική, ISBN: 978-960-218-522-3

68402905 Διοίκηση Παραγωγής Ο Σχεδιασμός Παραγωγικών Συστημάτων - Β΄ Έκδοση, Τύπος: Σύγγραμμα, Παππής Κώστας Π., 2017, UNIBOOKS ΙΚΕ, ISBN: 9786185304218

Additional material

Nahmias, S. (1997). Production and Operations Analysis, 3rd Edition, Irwin, Chicago

SOFTWARE ENGINEERING (ΠΛ0613) - AI

Coordinator: Chatzigeorgiou Alexander

Semester: 4th (Spring) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Chatzigeorgiou Alexander, Ampatzoglou Apostolos*

General competences

To understand the principles underlying the development of large-scale software projects. To gain an understanding of the methodologies and techniques employed in each phase of the software lifecycle.

Course content

Software Engineering Principles. Problems in the development of software projects.Differences from other technical disciplines. Product and process characteristics. Life cycle models.Software project management. Cost estimation, COCOMO.Requirements analysis and specification. Formal methods for requirements specification (Pre-post conditions, FSM, Petri Nets, Algebraic specifications, Z language). Structured Analysis.Architectural software design. Modularity, Abstraction, coupling - cohesion. Structured design.Object-oriented analysis and design methodologies. Unified Modeling Language.Coding. Testing, Theoretical foundations of testing. Documentation.Software metrics.Computer-Aided Software Engineering (CASE) tools.Applications with UML and C++/Java.Case Study: development of a complete software project.

Assessment

Written examination 65%

Compulsory Group Assignment 35%

Course bibliography

(One of the following):

13600 ΑΝΤΙΚΕΙΜΕΝΟΣΤΡΕΦΗΣ ΣΧΕΔΙΑΣΗ: UML, ΑΡΧΕΣ, ΠΡΟΤΥΠΑ ΚΑΙ ΕΥΡΕΤΙΚΟΙ ΚΑΝΟΝΕΣ, Τύπος: Σύγγραμμα, ΑΛΕΞΑΝΔΡΟΣ Ν. ΧΑΤΖΗΓΕΩΡΓΙΟΥ, 2005, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-882-1

13597 ΑΝΤΙΚΕΙΜΕΝΟΣΤΡΕΦΗΣ ΑΝΑΠΤΥΞΗ ΛΟΓΙΣΜΙΚΟΥ ΜΕ ΤΗ UML, Τύπος: Σύγγραμμα, ΒΑΣΙΛΗΣ ΓΕΡΟΓΙΑΝΝΗΣ, ΓΙΩΡΓΟΣ ΚΑΚΑΡΟΝΤΖΑΣ, ΑΧΙΛΛΕΑΣ ΚΑΜΕΑΣ, ΓΙΑΝΝΗΣ ΣΤΑΜΕΛΟΣ, ΠΑΝΟΣ ΦΙΤΣΙΛΗΣ, 2006, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-913-5

68402214 Τεχνολογία λογισμικού, Τύπος: Σύγγραμμα, Γιακουμάκης Μανόλης, Διαμαντίδης Νίκος, 2017, UNIBOOKS ΙΚΕ, ISBN: 9786185304416

Additional material

5th Semester

BUSINESS STRATEGY (ΠΛ0524) - TM

Coordinator: Kitsios Fotios

Semester: 5th (Winter) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Kitsios Fotios*

General competences

Structured market analysis, competition factors, value chains and competitive advantages, basic competition strategies, long-term goals and general strategies, shaping and implementing strategic decisions, outer and inner environment analysis, risk and strategic option, strategy analysis and evaluation, strategic planning. Preparation of strategic plans. Case studies.

Course content

Assessment

Written final examination 70%

coursework 30%

Course bibliography

(One of the following):

77107332 Στρατηγικό Μάνατζμεντ-Μια Ολοκληρωμένη Προσέγγιση -Θεωρία και Μελέτες Περίπτωσης, Τύπος: Σύγγραμμα, Hill W.L. Charles, Schilling A. Melissa, Jones R. Gareth, 2018, Broken Hill Publishers Ltd, ISBN: 9789925563524

50659970 ΣΤΡΑΤΗΓΙΚΗ ΤΩΝ ΕΠΙΧΕΙΡΗΣΕΩΝ ΤΟΜΟΣ Α΄, Τύπος: Σύγγραμμα, Τόμος: Α΄, ΠΑΠΑΔΑΚΗΣ ΒΑΣΙΛΕΙΟΣ, 2016, ΕΥΓΕΝΙΑ ΜΠΕΝΟΥ, ISBN: 978-960-359-119-1

59396604 Σχεδιασμός και Υλοποίηση Στρατηγικής των Επιχειρήσεων, Τύπος: Σύγγραμμα, A.Thompson Jr, Margaret A. Peteraf, John E. Gamble, Dr. A. J. (Lonnie) Strickland, 2016, Utopia, ISBN: 978-618-81298-0-1

50656356 ΒΑΣΙΚΕΣ ΑΡΧΕΣ ΕΠΙΧΕΙΡΗΜΑΤΙΚΗΣ ΣΤΡΑΤΗΓΙΚΗΣ, Τύπος: Σύγγραμμα, ROBERT M. GRANT, JUDITH JORDAN, 2016, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-670-1

59368002 Βασικές αρχές στρατηγικής των επιχειρήσεων, Τύπος: Σύγγραμμα, Johnson Gerry, Scholes Kevan, Whittington Richard, 2016, Κριτική, ISBN: 978-960-586-140-7

50656360 ΨΗΦΙΑΚΕΣ ΕΠΙΧΕΙΡΗΣΕΙΣ ΚΑΙ ΗΛΕΚΤΡΟΝΙΚΟ ΕΜΠΟΡΙΟ: ΣΤΡΑΤΗΓΙΚΗ, ΥΛΟΠΟΙΗΣΗ ΚΑΙ ΕΦΑΡΜΟΓΗ, Τύπος: Σύγγραμμα, DAVE CHAFFEY, 2016, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-671-8

13882 ΣΤΡΑΤΗΓΙΚΗ ΤΩΝ ΕΠΙΧΕΙΡΗΣΕΩΝ, Τύπος: Σύγγραμμα, ΜΙΧΑΛΗΣ ΜΙΧΑΛΟΠΟΥΛΟΣ, ΕΥΑΓΓΕΛΟΣ ΓΡΗΓΟΡΟΥΔΗΣ, ΚΩΝΣΤΑΝΤΙΝΟΣ ΖΟΠΟΥΝΙΔΗΣ, 2007, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-069-3

Additional material

COMPUTERIZED ACCOUNTING (ΠΛ0803) - AI

Coordinator: Vazakidis Athanasios

Semester: 5th (Winter) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Vazakidis Athanasios, Stavropoulos Antonios*

General competences

This course is aiming to:Enable students aware of the general accepted accounting principles (G.A.A.P.).Enable students aware of the content and the way by which Greek General Chart of Accounts is operating (classes of accounts 1-8).Enable students capable of posting entries in accounting books by using computers' software.Enable students aware of posting entries in relation to the opening and closing of the accounting books.Enable students capable for the accounting treatment of individuals and business entities using the Greek Centre of Informational and Economics Affairs, the VAT, and the Greek Social Insurance Organization.Enable students capable of reporting the basic financial statements such as the balance sheet and the income statement.ContentGreek general accepted accounting principles and accounting standardization. Description and analysis of the Greek general chart of accounts using the eight classes (1st -8th classes) of accounts classification. Understanding and using accounts such as: customers, vendors, creditors, accounts receivables, purchases and expenditures. Recognition of the existence of accounting errors in relation to the accounting doctrines and the results recorded in other accounts. Correct accounting errors, balancing their effects not only in the balance sheet but also in income statement, using counterbalancing and non counterbalancing approaches. Realization of concepts regarding tax subjects such as: direct and indirect taxes, tax bracket and gradual tax, value added tax (VAT) and its treatment in relation to the Greek legislation and general accepted accounting principles. Understanding and use of concepts related to insurance charges of employers and employees. Connection with Greek taxes net and accomplishment tax accounting tasks. Accounting of inventories. Reporting of accounting and financial transactions using the methodology related to the third class of book keeping (In relation to Greek Commercial and Tax Law). Generation of accounting reports, such as: general ledger, trial balance, balance sheet, profit and loss statement. Accounting exercises by the use of software. Accounting statements. Analytical presentation of accounting software by the use of computers and recording of representative movements of accounts with respect to the legal form of Greek companies. Case studies.

Course content

Assessment

Written final examination 100%

Optional coursework 30%

Course bibliography

(One of the following):

6717 Λογιστικά Πληροφοριακά Συστήματα Μηχανογραφημένη Λογιστική, Τύπος: Σύγγραμμα, Δ. Γκίνογλου, Π. Ταχυνάκης, Ν. Πρωτόγερος, 2004, Εκδοτικός Οίκος Rosili, ISBN: 960-7745-09-4

77244379 ΛΟΓΙΣΤΙΚΟ ΣΧΕΔΙΟ ΜΗΧΑΝΟΓΡΑΦΗΣΗ ΛΟΓΙΣΤΗΡΙΟΥ, ΒΑΖΑΚΙΔΗΣ ΑΘΑΝΑΣΙΟΣ, ΣΤΑΥΡΟΠΟΥΛΟΣ ΑΝΤΩΝΙΟΣ, ΧΑΤΖΗΣ ΑΝΑΣΤΑΣΙΟΣ

Additional material

Instructor's notes and slides

DIGITAL TELECOMMUNICATIONS SYSTEMS (ΠΛ0526) - AI

Coordinator: Psannis Konstantinos

Semester: 5th (Winter) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Psannis Konstantinos, Petridou Sofia*

General competences

Principles of Digital Communications/ Communication theory

Course content

Fourier analysis,Time/frequency representation of digital signals. Baseband Data Transmission,, Sampling Process, Voice/video Communication, Pulse Amplitude Modulation (PAM), Pulse Code Modulation, Shannon Limit , Modulation, Performance Parameters of Coding and Modulation Scheme , Power Limited and Bandwidth-Limited Channel, Nyquist Bandwidth, OSI Model, Data Communication Services, Multiplexing, Transmission Media, Transmission Impairments, Communication Networks, Information Theory/quantitative theory of information and its applications to reliable, efficient communication systems, Algorithms for Communications Systems and their Applications

Assessment

Written final examination / assignment/Virtual labs

Course bibliography

(One of the following):

18548860 Αρχές τηλεπικοινωνιακών συστήματων, Τύπος: Σύγγραμμα, Taub Herbert 1918-,Schilling Donald L., 2006, ΤΖΙΟΛΑ, ISBN: 978-960-418-061-5

77107676 Επικοινωνίες υπολογιστών και δεδομένων, 10η Έκδοση, Τύπος: Σύγγραμμα, Stallings William, Κατσαβούνης Στέφανος (επιμέλεια), 2018, ΤΖΙΟΛΑ, ISBN: 978-960-418-814-7

18548741 Ψηφιακές επικοινωνίες, Τύπος: Σύγγραμμα, Rice Michael, 2009, ΤΖΙΟΛΑ, ISBN: 978-960-418-176-6

3235 ΑΛΓΟΡΙΘΜΟΙ & ΕΦΑΡΜΟΓΕΣ ΣΥΣΤΗΜΑΤΩΝ ΕΠΙΚΟΙΝΩΝΙΩΝ ΤΟΜΟΣ 1:ΣΗΜΑΤΑ & ΣΥΣΤΗΜΑΤΑ, Τύπος: Σύγγραμμα, NEVIO BENVENUTO,GIOVANNI CHERUBINI, 2004, ΕΚΔΟΣΕΙΣ ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΠΑΤΡΩΝ, ISBN: 960-530-065-5

68369851 Τηλεπικοινωνιακά Συστήματα, 4η Έκδοση, Τύπος: Σύγγραμμα, Καραγιαννίδης Γεώργιος, Παππή Κοραλία, 2017, Τζιόλα, ISBN: 978-960-418-675-4

18549058 Εισαγωγή στις Τηλεπικοινωνίες, Τύπος: Σύγγραμμα, Κωττής Παναγιώτης Γ., 2011, ΤΖΙΟΛΑ, ISBN: 978-960-418-362-3

50657744 ΣΥΣΤΗΜΑΤΑ ΤΗΛΕΠΙΚΟΙΝΩΝΙΩΝ, Τύπος: Σύγγραμμα, Proakis/Salehi, 2015, Fountas, ISBN: 9789603307631

12866698 Digital Communications, Τύπος: Σύγγραμμα, John Proakis, Massoud Salehi, 2008, McGraw Hill, ISBN: 9780071263788

14869 Ψηφιακή Ανάλυση Σήματος, Τύπος: Σύγγραμμα, Proakis J, Manolakis D., 2010, Ίων, ISBN: 978-960-411-715-4

33197231 Ψηφιακά Συστήματα Επικοινωνιών, Τύπος: Σύγγραμμα, Simon Haykin, 2014, Παπασωτηρίου, ISBN: 978-960-491-088-5

Additional material

ebooks, papers, Demonstrations, Virtual Labs , Experiments (Labs)

ECONOMETRICS I (ΠΛ0504) - AI-TM

Coordinator: Dritsakis Nikolaos

Semester: 5th (Winter) | **Course type: Compulsory AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Dritsakis Nikolaos*

General competences

This course aims to provide an empirical content in economic theories using basic tools of Mathematics and Statistics. General aims are as follows: empirical verification and theory testing, exercise of economic policy and future values forecasting on economic variables.

Course content

1. Simple Regression
1.1 Introduction
1.2 Regression functions
1.3 Ordinary Least Squares Method
1.4 Properties of Regression Line
1.5 Hypotheses of Regression Model
1.6 Sampling distributions of least squares estimators
1.7 Properties of OLS estimators
1.8 Regression coefficients
1.9 Regression Line
1.10 Forecasting
2. Multiple Regression
2.1 Introduction
2.2 Regression functions
2.3 Ordinary Least Squares Method
2.4 Properties of Regression
2.5 The basic hypotheses of multiple regression model
2.6 Sampling distributions of least square estimators
2.7 Properties of OLS estimators
2.8 Regression coefficients
2.9 Regression Line
2.10 Investigation of multiple regression model
2.11 Special Topics
2.12 Regression Line Sensitivity
2.13 Forecasting
3. Hypotheses Violation: The non sphericity of errors
3.1 Introduction
3.2 Generalized least squares method
3.3 Generalized method of maximum likelihood
3.4 Other possible generalized estimation methods
3.5 Heteroscedasticity
3.6 Autocorrelation
3.7 Normality
4. Hypotheses Violation: Problems of Sample
4.1 Introduction
4.2 Multicollinearity
4.3 Specification Errors

Assessment

Written final examination 80%
Mandatory Coursework 20%

Course bibliography

(One of the following):

32997757 ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΟΙΚΟΝΟΜΕΤΡΙΑ ΜΕ ΤΗ ΧΡΗΣΗ ΤΟΥ ΛΟΓΙΣΜΙΚΟΥ EVIEWS, Τύπος:

INFORMATION SYSTEMS ANALYSIS AND DESIGN (ΠΛ0603-1) - TM

Coordinator: Tambouris Efthimios

Semester: 5th (Winter) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Tambouris Efthimios*

General competences

This course aims at developing the following skills and competences:

- analytical and synthetic ability in design and analysis of information systems
- decision making
- organizational, collaborative learning
- presentation and defense of positions
- writing skills
- teamwork
- evaluation and self-evaluation

After completing the course students will be able to:

- enumerate methodologies and phases of analyzing and designing information systems
- identify and enumerate the development phases of information systems
- distinguish the components and perform a feasibility study
- recognize the requirements collection methods and their components and apply and compare the main requirements elicitation strategies (BPA, BPI, BPR)
- analyze information systems using UML diagrams (usage cases, classes, objects)
- model business processes using UML activity diagrams
- design information systems using UML diagrams and model the behavior of a system using UML sequence diagrams
- use special tools to analyze and design information systems that support UML (such as VisualParadigm)

Course content

This course aims at developing analytical and synthetic skills through the understanding and application of modern methods for Analysis and Design of Information Systems using the Unified Modeling Language (UML)

The structure of the course includes the following main subject areas:

- Introduction to information systems analysis and design, e-learning platform used and CaseStudy
- Preparation: Project start and project management
- Analysis: Collection of requirements and scenarios
- Analysis: Business Modeling – UML activity diagrams
- Analysis: Functional modeling – UML use case diagrams
- Analysis: Functional modeling – UML use case templates
- Analysis: Interfaces – HCI design
- Analysis: Structural modeling – UML class diagrams
- Analysis: structural modeling – UML object diagrams
- Design: concepts and design strategy – detailed UML class diagrams
- Design: behavioral modeling – UML sequence diagrams
- Implementation: From UML to Java
- Evaluation

Assessment

Student assessment is based on 3 main criteria with the corresponding gravity ratios:

- Final Examination: 50%
- Project of 4-5 students (Interim Reports / Progress Presentations, Deliverables, Final Report): 30%
- Individual work in the classroom:20%

Students are informed about the obligations, the policy and the requirements of the group work (project preparation and regular progress checks / class presentations). Students (groups of 4-5 people) are invited to analyze and design an information system based on a scenario, applying all the

MARKETING INFORMATION SYSTEMS (ΠΛ0114) - AI-TM

Coordinator: Vlachopoulou Maro

Semester: 5th (Winter) | **Course type: Compulsory AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Vlachopoulou Maro*

General competences

This course introduces students to the multiply elements of E-Marketing; Marketing Information Systems, e-Marketing, Internet / mobile marketing.Emphasis is on tools and techniques appropriate for the management of marketing information needed to support marketing decision making.To introduce students to a) the new ways ICT and Internet has changed the rules of marketing, (b) to current information systems and tools in the E-Marketing space, to teach students how (c) to design and facilitate a real world E-Marketing action /campaign, and (d) to measure its performance.ContentConceptual framework of E-marketing. Marketing Information Systems (MAIS), Internet marketing, online/digital marketing, mobile marketing, e- vs. traditional marketing, marketing applications.Current map of e- marketing, MAIS typology. Overview of marketing information systems, users and sources of marketing information. Database Marketing and Customers/Partners Relationship Management (CRM/ PRM), knowledge-based marketing, applications of Geographic Information Systems in marketing (GIS), electronic identification and data collection systems (bar codes, EPOS, smart cards, etc.).E-marketing plan, e-marketing mix and e-marketing strategy. The use of electronic technology /systems/ networks in marketing: as a channel for marketing research, as a medium for promotion and relationship building, as a distribution channel, and as a platform for connecting groups and offering network services. Online customers behavior, differentiation and positioning strategies. Social media marketing and networks. Website marketing management. E-marketing performance metrics and analysis.Case Studies.

Course content

Assessment

Essay (a literature review and empirical research paper) 30%

Case study (presentation and writing) 30%

Written final examination 40%

Course bibliography

(One of the following):

32997535 Ηλεκτρονικό Επιχειρείν και Μάρκετινγκ, Τύπος: Σύγγραμμα, Βλαχοπούλου Μάρω ,Δημητριάδης Σέργιος, 2013, Εκδοτικός Οίκος Rosili, ISBN: 978-960-7745-32-3

14035 ΚΑΙΝΟΤΟΜΙΑ, ΣΤΡΑΤΗΓΙΚΗ, ΑΝΑΠΤΥΞΗ ΚΑ ΠΛΗΡΟΦΟΡΙΑΚΑ ΣΥΣΤΗΜΑΤΑ, Τύπος: Σύγγραμμα, Γεώργιος Δουκίδης, 2010, ΑΝΔΡΕΑΣ ΣΙΔΕΡΗΣ - ΙΩΑΝΝΗΣ ΣΙΔΕΡΗΣ & ΣΙΑ Ο.Ε., ISBN: 978-960-08-0528-4

14952 Εισαγωγή στο Marketing, Τύπος: Σύγγραμμα, Armstrong Gary,Kotler Philip, 2009, Επίκεντρο, ISBN: 978-960-458-204-4

59395494 Επικοινωνία και Διαφήμιση στα Μέσα Κοινωνικής Δικτύωσης, Τύπος: Σύγγραμμα, Ανδρονίκη Κάβουρα, 2016, ΔΙΟΝΙΚΟΣ, ISBN: 978-960-6619-80-9

Additional material

Instructor's website

(Students will access literature references and all other course materials online) (http://compus.uom.gr/INF173/)

MULTIMEDIA TECHNOLOGIES AND COMMUNICATIONS (ΠΛ0520) - AI

Coordinator: Kokkinidis Konstantinos-Iraklis

Semester: 5th (Winter) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Kokkinidis Konstantinos-Iraklis*

General competences

After the completion of this course, the students will be capable to: - analyze and study various multimedia technologies - discuss and describe specialized topics of multimedia communications as well as to point the use of those concepts on developing, assessing, and evaluating multimedia applications.Content - multimedia technologies (digitization, compression & multimedia content-based analysis) - multimedia communications (requirements, protocols, real-time multimedia services, QoS, streaming technologies, multimedia transmission & synchronization) - multimedia systems - applications (interactive «retrieval systems: hypertext - hypermedia WWW'», interpersonal «video-conferencing systems» and distribution «VoD systems»)

Course content

Assessment

Written examination 100%

Course bibliography

(One of the following):

22728229 Πολυμέσα Αναλυτικός Οδηγός, 8η Έκδοση, Τύπος: Σύγγραμμα, Tay Vaughan, 2012, Α. Γκιούρδα & ΣΙΑ ΟΕ, ISBN: 978-960-512-633-9

Πρόσθετο Διδακτικό Υλικό:

320156 ΠΟΛΥΜΕΣΑ, Τύπος: Ηλεκτρονικό Βιβλίο, ΦΩΤΙΟΣ ΛΑΖΑΡΙΝΗΣ, 2016, , ISBN: 978-960-603-141-0

Additional material

Slides

NETWORK AND WEB APPLICATIONS SECURITY (ΠΛ0825) - TM

Coordinator: Mavridis Ioannis

Semester: 5th (Winter) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Mavridis Ioannis*

General competences

The student will (a) gain familiarity with protection requirements of modern information and communication systems, (b) learn the fundamental cryptology-based techniques for securing data processing and transmission over the Internet, (c) acquire experience on applying the above techniques in laboratory conditions.

Course content

Basic concepts (Network and Internet security issues, Types of attacks and countermeasures, Comparison of security technologies)

Introduction to Cryptography (Terminology, Types of cryptographic systems and features of their components, Key-stream generators)

Classic Cryptographic Algorithms and Cryptanalysis (Caesar, Vigenere, One Time Pad / Vernam, ROT13, Transposition algorithms, Substitution algorithms, Application examples with CRYPTOOL)

Modern Symmetric Cryptographic Algorithms and Cryptanalysis (DES, 3-DES, AES, IDEA, RC2, RC4, etc, Modes of Operation (ECB, CBC, OFB, CFB), Application examples with CRYPTOOL)

Modern Asymmetric Cryptographic Algorithms and Cryptanalysis (Diffie-Hellman, ECDH, RSA, ECC, Application examples with CRYPTOOL)

Integrity Mechanisms (CBC-MAC, HMAC, OWHF, CRHF, MD5, SHA, DSA, ECDSA, etc, Application examples with CRYPTOOL)

Applications of Cryptography (message digests, digital signatures, digital certificates, etc)

Certification Infrastructures (Components and Features of Public Key Infrastructures - PKIs)

Protection of Digital Communications (S/MIME, PGP, Kerberos, SSL/TLS, IPsec, etc)

Protocols for Secure Transactions over the Internet (eCash, CAFE, NetCash, CyberCoin, CyberCash, iKP, SET, etc)

Wired Network and Web Applications Security (Issues, Critical vulnerabilities, Types of attacks, Case studies)

Firewalls and IDSs (Kinds of mechanisms, Architectures, Case studies)

Wireless Network security (Operational features and security issues, Protection mechanisms and protocols (WEP, WPA, IEEE 802.11i, etc), Techniques and types of attacks, Case studies)

Assessment

Written final examination 60%

Optional coursework up to 40%

Course bibliography

(One of the following):

5425 ΑΣΦΑΛΕΙΑ ΠΛΗΡΟΦΟΡΙΑΚΩΝ ΣΥΣΤΗΜΑΤΩΝ, Τύπος: Σύγγραμμα, ΠΑΓΚΑΛΟΣ ΓΕΩΡΓΙΟΣ,ΜΑΥΡΙΔΗΣ Ι., 2002, ΑΝΙΚΟΥΛΑ, ISBN: 9605160188

9675 Ασφάλεια Δικτύων Υπολογιστών, Τύπος: Σύγγραμμα, Γκρίτζαλης Στέφανος,Γκρίτζαλης Δημήτρης Α.,Κάτσικας Σωκράτης, 2003, Παπασωτηρίου, ISBN: 978-960-7530-45-5

Additional material

Instructor's notes and slides

PROJECT PLANNING AND MANAGEMENT (ΠΛ0523) - TM

Coordinator: Madas Michael

Semester: 5th (Winter) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Madas Michael*

General competences

This course aims at developing the following skills and competences:

- project design and management (using appropriate tools / software, e.g. Microsoft Project)
- implementation of project management principles and practice in "real-life" conditions (e.g. small-scale projects)
- decision making
- organizational, collaborative learning
- presentation and defense of positions
- writing skills
- teamwork, leadership, altruism
- evaluation and self-evaluation

After completing the course, students will be able to:

- define the aim, scope, objectives and basic structure of a project in a systematic manner
- select the appropriate project to implement
- design and analyze the organizational structure of a project (Work Breakdown Structure - WBS)
- perform Critical Path Method (CPM) time scheduling
- plan resource requirements and apply resource-smoothing techniques
- apply costing methods and control time allocation of cost
- apply risk and change management principles and techniques
- implement appropriate tools and techniques to monitor, control, review and improve the management process of a project
- perform the appropriate work for the proper completion and documentation of a project

Course content

The course examines the overall life cycle of project management. In particular, issues analyzed include the definition and selection of a project, organization and structural analysis of the project, time planning, resource and cost management, change management and risk management, as well as control of implementation and evaluation of the project. Particular emphasis is put on the presentation and analysis of theory through practical training to address the major challenges facing the management of modern projects with emphasis on IT projects.

The structure of the course includes the following main topics / phases in the life cycle of a project management:.

- Definition phase: Project aim and initiation
- Definition phase: Definition and Selection
- Design phase: Working in Groups
- Design phase: Work Breakdown Structure
- Design phase: Critical Path Management
- Design phase: Time scheduling and Gantt Graphs
- Design phase: Cost management
- Design phase: Change and risk management
- Implementation phase: Quality assurance and project control
- Implementation phase: Implementation of the project
- Evaluation Phase: Project Evaluation and Overview
- Evaluation Phase: Project Performance Improvement

Assessment

Student assessment is based on 2 main criteria with the corresponding gravity ratios:

- Final Examination: 50%

E-COMMERCE TECHNOLOGY (ΠΛ0521) - AI

Coordinator: Georgiadis Christos

Semester: 5th (Winter) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Georgiadis Christos*

General competences

The student is introduced to several concepts (infrastructures, activities, programming techniques) involved with the development of e-commerce (EC) applications. At the end of the course, he/she should be able to: (a) understand current technologies of Web-based applications; (b) identify and express the typical requirements of EC applications; (c) design and develop small-scale Web-based and EC applications.

Course content

LECTURES:- e-Architectures, Web & e-commerce applications- mobile e-commerce, mobile devices & Web - e-Payments and e-commerce security - Usability and Accessibility, Personalization and Recommendation SystemsLAB:The Visual Studio integrated development environment (IDE) – Developing Web-based applications & e-commerce sites (C#, ADO.NET, ASP.NET) - Introduction to visual programming, visual tools/mechanisms, object-oriented event-driven programming, development of Web-based applications.- Developing e-commerce sites. Case studies (design and implementation).

Assessment

Written final examination 80%

Optional coursework 20%

Course bibliography

(One of the following):

33154014 Ηλεκτρονικό Εμπόριο 2014, Τύπος: Σύγγραμμα, Laudon K.,Traver C. C., 2014, Παπασωτηρίου, ISBN: 978-960-491-085-4

Επιλογές ελεύθερων συγγραμμάτων

320170 ΤΕΧΝΟΛΟΓΙΕΣ ΠΑΓΚΟΣΜΙΟΥ ΙΣΤΟΥ ΚΑΙ ΗΛΕΚΤΡΟΝΙΚΟΥ ΕΜΠΟΡΙΟΥ, Τύπος: Ηλεκτρονικό Βιβλίο, ΧΡΗΣΤΟΣ ΓΕΩΡΓΙΑΔΗΣ, 2016, , ISBN: 978-960-603-125-0

Additional material

Instructor's notes and slides. Instructor's website

(Compus: http://compus.uom.gr/INF245/index.php) (Compus)

6th Semester

ARTIFICIAL INTELLIGENCE (ΠΛ0701) - AI

Coordinator: Refanidis Ioannis

Semester: 6th (Spring) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Refanidis Ioannis*

General competences

Artificial Intelligence is an area of computer science with an increasing number of applications in the recent years. The aim of the course is to present the principles of the area, on which all modern applications are based. By the end of the course the student will be able to: (a) model problems and use suitable search algorithms to solve them; (b) represent knowledge and reason over it; (c) model and solve planning/scheduling problems.

Course content

Introduction to Artificial Intelligence. Problem representation - Search tree. Search algorithms. Blind search and informed search.

Constraint satisfaction problems. Arc consistency. Constraint propagation.

Adversary games. Minimax search and alpha-beta pruning. Games with chance.

Knowledge and reasoning. Propositional logic. First order logic. Proof procedures and the Resolution Principle. Rule Based Systems.

Planning. STRIPS representation. Progression and Regression. Partial order planning. Temporal planning and planning with resources.

Assessment

Written examination 80%

Homework 20%

Course bibliography

(One of the following):

Artificial Intelligence, a modern approach. STUART RUSSELL and PETER NORVIG, 3rd edition, Prentice Hall.

13909 ΤΕΧΝΗΤΗ ΝΟΗΜΟΣΥΝΗ: ΜΙΑ ΣΥΓΧΡΟΝΗ ΠΡΟΣΕΓΓΙΣΗ, Τύπος: Σύγγραμμα, STUART RUSSELL, PETER NORVIG, 2005, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-873-2

12867416 ΤΕΧΝΗΤΗ ΝΟΗΜΟΣΥΝΗ, Τύπος: Σύγγραμμα, ΒΛΑΧΑΒΑΣ Ι.,ΚΕΦΑΛΑΣ Π.,ΒΑΣΙΛΕΙΑΔΗΣ Ν.,ΚΟΚΚΟΡΑΣ Φ.,ΣΑΚΕΛΛΑΡΙΟΥ Η., 2011, ΕΚΔΟΣΕΙΣ ΠΑΝ/ΜΙΟΥ ΜΑΚΕΔΟΝΙΑΣ, ISBN: 978-960-8396-64-7

Additional material

Lecture slides. Exemplary solved exercises.

Course site (http://compus.uom.gr/INF184/index.php)

ECONOMETRICS II (ΠΛ0709) - AI

Coordinator: Dritsakis Nikolaos

Semester: **6th** (Spring) | **Course type:** **Compulsory AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Dritsakis Nikolaos*

General competences

Upon completion of this course, students should be able to:(a) Understand the basic principles of Econometrics II(b) Identify the main theories of Econometrics II(c) Apply the methodologies of Econometrics II on real cases(d) Use the tools of Econometrics II in decision - making

Course content

- Models with dummy variables (functional relocation, functional rotation, simultaneous functional relocation and rotation, simultaneous use of more than one qualitative explanatory variables, Use of dummy variables in seasonal analysis)

- Combining cross-section and time-series data (cross-section heteroscedasticity, cross-section independence and time-series autocorrelation, cross-section heteroscedasticity, cross-section correlation and time-series autocorrelation)

- Distributed-lag models (DLM) (Estimation of DLM, Estimation of DLM under restrictions with limited or unlimited number of lags, empirical DLM, methods of estimation of DLM with unlimited number of lags, diagnostic tests, and applications)

- Simultaneous equation models (simultaneous equations bias, identification, methods of estimation (indirect least squares, two-stages least squares), seemingly unrelated equations, diagnostic tests, model analysis)

Assessment

Written final examination 20%

Final examination in laboratory 80%

Course bibliography

(One of the following):

1150 ΣΥΓΧΡΟΝΗ ΟΙΚΟΝΟΜΕΤΡΙΑ, Τύπος: Σύγγραμμα, ΒΑΜΒΟΥΚΑΣ ΓΕΩΡΓΙΟΣ, 2007, ΟΠΑ, ISBN: 978-960-86157-9-3

161413 Οικονομετρία, Τύπος: Σύγγραμμα, Χάλκος Γεώργιος, 2011, Gutenberg, ISBN: 978-960-01-1394-5

Additional material

EMBEDDED SYSTEMS (ΠΛ0623) - TM

Coordinator: Kaskalis Theodoros

Semester: **6th** (Spring) | **Course type:** **Compulsory TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Kaskalis Theodoros*

General competences

The subject aims to present the Embedded Systems' ecosystem in a practical and also in a managerial way. The final target is the understanding of the immense penetration of digital technologies in everyday life and the methods that will allow this "ubiquitous" computing practice to become profitable business. The subject presents the design of hardware and software under a common perspective.

Course content

Embedded Systems' definition, characteristics, applications, demands. General and special purpose microprocessors, ASICs, Field Programmable Gate Arrays (FPGAs), Complex Programmable Logic Devices (CPLDs). Design, development, control and production methods. Electronic Design Automation tools. Proper function verification. Final product design and prototyping. Peripheral devices, serial and parallel communication. On-board and off-board circuit communication. Sensors, actuators. Conversion between analog and digital signals. Microcontrollers: families, characteristics, evolution, applications.

Assessment

Written final examination

Coursework

Course bibliography

(One of the following):

64314 Ψηφιακή Σχεδίαση με VHDL, Τύπος: Σύγγραμμα, Peter J Ashenden, 2010, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ, ISBN: 978-960-6759-505

3409 Οι Υπολογιστές ως Συστατικά Στοιχεία, Τύπος: Σύγγραμμα, Wayne Wolf, 2008, Εκδόσεις Νέων Τεχνολογιών, ISBN: 978-960-6759-18-5

Additional material

(http://compus.uom.gr/MT144)

ENTERPRISE ARCHITECTURES (ΠΛ0624) - TM

Coordinator: Vergidis Konstantinos

Semester: **6th** (Spring) | **Course type:** **Compulsory TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Vergidis Konstantinos*

General competences

Course content

Enterprise Architectures provide a holistic view of the Organisation that unified its various aspects such as: Business Processes, Information Systems, Human Resources etc. Throughout the course, various Enterprise Architecture Frameworks are presented that enable this holistic (re)structuring of the Organisation based on specific rules, constructs and principles. Enterprise Architectures allow the modelling and analysis of various aspects of the Enterprise in a systematic manner. They are an essential tool of design and analysis of complex business information systems. The course introduces software tools for the student to design and build a complete business model based on the principles of Enterprise Architectures.

Assessment

Course bibliography

(One of the following):

22769685 ΔΙΑΧΕΙΡΙΣΗ ΕΠΙΧΕΙΡΗΣΙΑΚΩΝ ΔΙΑΔΙΚΑΣΙΩΝ: ΟΡΓΑΝΩΣΗ, ΑΝΑΔΙΟΡΓΑΝΩΣΗ ΚΑΙ ΒΕΛΤΙΩΣΗ, Τύπος: Σύγγραμμα, ΝΙΚΟΛΑΟΣ Α. ΠΑΝΑΓΙΩΤΟΥ, ΝΙΚΟΛΑΟΣ ΕΥΑΓΓΕΛΟΠΟΥΛΟΣ, ΠΕΤΡΟΣ ΚΑΤΗΜΕΡΤΖΟΓΛΟΥ, ΣΩΤΗΡΗΣ ΓΚΑΓΙΑΛΗΣ, 2013, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-516-2

22769685 ΔΙΑΧΕΙΡΙΣΗ ΕΠΙΧΕΙΡΗΣΙΑΚΩΝ ΔΙΑΔΙΚΑΣΙΩΝ: ΟΡΓΑΝΩΣΗ, ΑΝΑΔΙΟΡΓΑΝΩΣΗ ΚΑΙ ΒΕΛΤΙΩΣΗ, Τύπος: Σύγγραμμα, ΝΙΚΟΛΑΟΣ Α. ΠΑΝΑΓΙΩΤΟΥ, ΝΙΚΟΛΑΟΣ ΕΥΑΓΓΕΛΟΠΟΥΛΟΣ, ΠΕΤΡΟΣ ΚΑΤΗΜΕΡΤΖΟΓΛΟΥ, ΣΩΤΗΡΗΣ ΓΚΑΓΙΑΛΗΣ, 2013, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-516-2

68373062 Βασικές Αρχές της Διαχείρισης Επιχειρησιακών Διαδικασιών, Τύπος: Σύγγραμμα, Dumas Marlon, La Rosa Marcello, Mendling Jan, Reijers Hajo, 2017, BROKEN HILL PUBLISHERS LTD, ISBN: 9789963258918

Additional material

INFORMATION AND SYSTEMS SECURITY (ΠΛ0713-2) - AI

Coordinator: Mavridis Ioannis

Semester: 6th (Spring) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Mavridis Ioannis*

General competences

The student will (a) learn the fundamental issues and principles of information and systems security, (b) gain familiarity with theoretical background like security models and policies, (c) acquire knowledge and experience on basic protection techniques and new directions on developing secure information systems.

Course content

Introduction (Fundamental concepts, Security breaches, Vulnerabilities, Threats, Control measures, IS security requirements, Privacy protection)

Personal Computers Security - Malicious Code (Viruses, Warms, Trojan Horses)

Identification and Authentication (Techniques, media, standards, procedures and issues, Implementations in common operating systems)

Access Control (Discretionary, Mandatory, Role-based, Extensions and Implementations in common operating systems)

IS Security Models and Policies (Clark-Wilson, Harrison-Ruzzo-Ullman, Graham-Denning, Chinese Wall, Bell-La Padula, Biba, High-Level Security Policies).

Risk Analysis and Assessment (Theoretical approaches, Application examples, Cramm and Cobra tools)

Computer Systems Security Evaluation (TCSEC criteria, ITSEC criteria, Federal criteria (FF), Common Criteria (CC))

Database Systems Security (Components and security domains, Implementations in the DBMS of ORACLE)

Mobile Computing Systems Security (Mobile computing systems infrastructure configuration, classification of security parameters, security mechanisms and standards)

Assessment

Written final examination 60%

Optional coursework up to 40%

Course bibliography

(One of the following):

5425 ΑΣΦΑΛΕΙΑ ΠΛΗΡΟΦΟΡΙΑΚΩΝ ΣΥΣΤΗΜΑΤΩΝ, Τύπος: Σύγγραμμα, ΠΑΓΚΑΛΟΣ ΓΕΩΡΓΙΟΣ,ΜΑΥΡΙΔΗΣ Ι., 2002, ΑΝΙΚΟΥΛΑ, ISBN: 9605160188

2165 Ασφάλεια Πληροφοριακών Συστημάτων, Τύπος: Σύγγραμμα, Σωκτ. Κάτσικας - Δ. Γκρίτζαλης - Στεφ. Γκρίτζαλης, 2004, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ, ISBN: 960-8105-57-9

Additional material

Instructor's notes and slides

INFORMATION TECHNOLOGY LAW (IT LAW) (ΠΛ0617) - AI

Coordinator: Alexandropoulou Evgenia

Semester: **6th** (Spring) | **Course type:** **Compulsory AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Alexandropoulou Evgenia*

General competences

The aim of this course is to familiarize students with the legal framework of personal data protection, including the rules governing their electronic processing, as well as with the legal framework of intellectual rights in digital environment.

Course content

Part I: Electronic processing of personal data (Legal framework/ Simple and sensitive personal data/ Obligations of data controllers/ Rights of data subjects/ Sanctions/ The Data Protection Authority)

Part II: IT and intellectual property. Historical background of copyright law/ The necessity of legal protection of copyright in the modern digital environment/ Modern legal environment of copyright / Legal protection of computer programmes, databases, multimedia/ Copyright transfer/ Right owners/ Right enforcements and sanctions/ Right collective management organizations/ Intellectual Property Organization

Assessment

Written Final examination 100%

Optional coursework

Course bibliography

(One of the following):

59395808 ΠΡΟΣΩΠΙΚΑ ΔΕΔΟΜΕΝΑ, Τύπος: Σύγγραμμα, ΕΥΓΕΝΙΙΑ ΑΛΕΞΑΝΔΡΟΠΟΥΛΟΥ-ΑΙΓΥΠΤΙΑΔΟΥ, 2016, ΝΟΜΙΚΗ ΒΙΒΛΙΟΘΗΚΗ ΑΕΒΕ, ISBN: 978-960-562-609-9

33153104 ΔΙΚΑΙΟ ΠΡΟΣΩΠΙΚΩΝ ΔΕΔΟΜΕΝΩΝ, Τύπος: Σύγγραμμα, ΧΡΙΣΤΟΔΟΥΛΟΥ ΚΩΝΣΤΑΝΤΙΝΟΣ, 2013, ΝΟΜΙΚΗ ΒΙΒΛΙΟΘΗΚΗ ΑΕΒΕ, ISBN: 978-960-562-078-3

Additional material

See www.itlaw.uom.gr , www.dpa.gr , www.opi.gr

MOBILE AND WIRELESS COMMUNICATIONS SYSTEMS (ΠΛ0841) - TM

Coordinator: Psannis Konstantinos

Semester: **6th** (Spring) | **Course type:** **Compulsory TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Psannis Konstantinos*

General competences

Course content

Mobile and personal communications, Wireless mobile and personal communication systems, Design issues, Impact of mobility on communication networks, 3G and 4G mobile communication systems. The wireless environment in mobile communications, Radio Propagation and Propagation Path-Loss Models An Overview of Digital Communication and Transmission, Fundamentals of Cellular Communications, Multiple Access Techniques, Modulation Schemes, Antennas, Diversity, and Link Analysis, Spread Spectrum (SS) and CDMA Systems, Tele-traffic Engineering, Mobility management, Location management, Location update, Methods for mobile terminal positioning. Algorithms for mobile and wireless Communications Systems and their Applications, Security management, managerial and regulatory issues.

Assessment

Written final examination / Assignment/lab tests

Course bibliography

(One of the following):

18548787 Δίκτυα κινητών και προσωπικών επικοινωνιών, Τύπος: Σύγγραμμα, Θεολόγου Μ., 2010, ΤΖΙΟΛΑ, ISBN: 978-960-418-278-7

Additional material

ebooks, papers, Demonstrations, Virtual Labs , Experiments (http://compus.uom.gr)

OPERATIONS RESEARCH (ΠΛ0814-1) - AI

Coordinator: Hristou - Varsakelis Dimitrios

Semester: 6th (Spring) | **Course type: Compulsory AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Hristou - Varsakelis Dimitrios*

General competences

Operations Research (OR) concerns the use of mathematical models, techniques and algorithms for the purposes of making optimal decisions in problems concerning engineering, economics, management, bioinformatics and many other areas. The course aims to help students a)understand the fundamental principles and results available for some of the most important classes of optimization problems and b) formulate and solve optimization problems using analytical and computational methods.

Course content

1. Linear programming
2. Nonlinear programming
3. Laboratory exercises using SageMath

Assessment

Written final examination (70%), Homework assignments (30%)

Course bibliography

(One of the following):

59386820 Εισαγωγή στην Επιχειρησιακή Έρευνα, 10η Έκδοση, Τύπος: Σύγγραμμα, Hillier Frederick S., Lieberman Gerald J., Διαμαντίδης Αλέξανδρος (επιμέλεια), 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-604-4

59415056 Εισαγωγή στην Επιχειρησιακή Έρευνα, 10η Έκδοση, Τύπος: Σύγγραμμα, Taha A. Hamdy, 2017, ΤΖΙΟΛΑ, ISBN: 978-960-418-691-4

Additional material

Class Notes

PARALLEL AND DISTRIBUTED COMPUTING (ΠΛ0621) - AI

Coordinator: Margaritis Konstantinos

Semester: **6th** (Spring) | **Course type:** **Compulsory AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Margaritis Konstantinos*

General competences

• Distinguish between concurrent, parallel and distributed computing.

• Distringusih between multiple, theoretical and applied / programming constructs for task communication and coordination.

• Distringuish between basic types of modern architectures / models of parallel and distributed computing systems.

• Selection and mapping of algorithms and applications on parallel and distributed computing systems.

• Application of basic types of parallel and distributed decompostion on algorithms and applications.

• Characteριzation of algorithms and applications based on their potential to be decompsoed for parallel and distributed computation and initial estimation of the performance of the proposed solution.

• Writiong of simple parallel and distributed applications including task creation, data distribution, comnputations, data collection and task termination. .

• Debugging of simple parallel and distributed applications at algorithmic anf programming level, and experimental estimation of application performance and scalability.

Course content

• Fundamentals of Parallel and Distributed Computing: Concurrency, Communication and Coordination

• Parallel and Distributed Systems Architecture: Overview of Modern Computer Systems

• Software Support of Parallel and Distributed Computing: Systems Software, Programming Languages, Middleware

• Problem Decomposition and Programming Techniques for Parallel and Distributed Computing

• Algorithms and Performance Analysis for Paralel and Ditributed Computing: an Introduction

Assessment

• Laboratoty Exercises

• Written Examination

Course bibliography

(One of the following):

50655947 Αρχές Προγραμματισμού με Ταυτοχρονισμό και Κατανομή Λογισμικού, 2η Έκδοση, Τύπος: Σύγγραμμα, Ben-Ari, 2015, ΤΖΙΟΛΑ, ISBN: 978-960-418-591-7

Additional material

• Course web site

• Parallel and Distributed Systems Programming with Java (in Greek), Π. Μιχαηλίδης, Κ.Γ. Μαργαρίτης, Πανεπιστημιακές Σημειώσεις

QUALITY ASSURANCE AND QUALITY CONTROL TECHNIQUES (ΠΛ0625) - TM

Coordinator: Nikolaidis Ioannis

Semester: 6th (Spring) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Nikolaidis Ioannis*

General competences

This course constitutes one of the most important "extensions" - applications of Probability and Statistics. In its framework, simple as well as more developed quality control techniques for products or processes which can be applied in any type of factory are presented to students. During this course students get in touch with industries through case studies and exercises of the real world. Finally, students become familiar with the relevant software.

Course content

Introduction, basic knowledge on Probability and Statistics. Basic knowledge on Quality. Quality management systems. Acceptance sampling for attributes. Acceptance sampling by variables. Process capability analysis. Control charts: general rules and principles. Control charts for attributes or variables. Advanced control charts. Design of a control chart. Basic knowledge on Quality Assurance Standards.

Assessment

100% final written exam, 5% for each project.

Course bibliography

(One of the following):

11368 Στατιστικός έλεγχος ποιότητας, Τύπος: Σύγγραμμα, Ταγαράς Γιώργος Ν., 2001, Ζήτη, ISBN: 960-431-706-7

123151 Ποιοτικός έλεγχος παραγωγής, Τύπος: Σύγγραμμα, Παπαργύρης Αθανάσιος, Παπαργύρης Δημήτριος, 2010, Ζήτη, ISBN: 978-960-456-238-1

Additional material

Introduction to Statistical Quality Control. D. Montgomery, Εκδ. Wiley, 1997

SUPPLY CHAIN MANAGEMENT (ΠΛ0622) - TM

Coordinator: Madas Michael

Semester: 6th (Spring) | **Course type: Compulsory TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Madas Michael*

General competences

The course aims to present topics related to the design, planning and operation of logistics and supply chain business functions of contemporary companies and organizations.

Course content

The course covers the following thematic sections: i) introduction, structure and basic concepts of Supply Chain Management (SCM), ii) role and importance of SCM, iii) SCM operations and functions, iv) customer service, v) demand forecasting, vi) distribution channels, vii) inventory management, viii) warehousing, ix) freight transport and x) Greek and international logistics.

Assessment

Final exam: 60%

Team/group assignment (and presentation): 40%

Course bibliography

(One of the following):

1. Chopra, S. and P. Meindl (Επιμέλεια Λ. Τσιρώνης), (2014), Διοίκηση Εφοδιαστικής Αλυσίδας: Στρατηγική, Προγραμματισμός και Λειτουργία, Εκδόσεις Τζιόλα. (Κωδικός Βιβλίου στον Εύδοξο: 41955004)

2. Bowersox, D., D. Closs, M. Bixby Cooper, and J. Bowersox (Επιμέλεια Α. Νεάρχου, Φ. Βούζας, Π. Ρεπούσης), (2015), Logistics: Εφοδιαστική & Διοίκηση Δικτύων Διανομής, Broken Hill Publishers Ltd. (Κωδικός Βιβλίου στον Εύδοξο: 50659353)

Additional material

Lectures slides/material (Compus)

Relevant Scientific Journals:

Journal of Supply Chain Management

Supply Chain Management: An International Journal

Journal of Business Logistics

International Journal of Logistics Management

International Journal of Logistics: Research and Applications

International Journal of Physical Distribution and Logistics Management

EURO Journal of Transportation and Logistics

Transportation Research Parts A, B, C, D & E

Transportation Research Record

Interfaces

Transportation Science

Transport Policy

Journal of Global Operations and Strategic Sourcing

Production and Operations Management

Management Science

Operations Research

European Journal of Operational Research

SYSTEMS DEVELOPMENT TECHNOLOGY WITH PYTHON (ΠΛ0626) - TM

Coordinator: Vergidis Konstantinos

Semester: **6th** (Spring) | **Course type:** **Compulsory TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Vergidis Konstantinos*

General competences

Course content

The course focuses on software engineering principles and methods, with emphasis on developing Business Information Systems that cover specific business needs.

The course involves practice in configuring open software and using software as a service (SaaS) applications that are freely available on the web. Indicative examples of application areas are business portals, content management systems, business processes systems using BPEL and workflow systems.

Assessment

Course bibliography

(One of the following):

68402214 Τεχνολογία λογισμικού, Τύπος: Σύγγραμμα, Γιακουμάκης Μανόλης, Διαμαντίδης Νίκος, 2017, UNIBOOKS IKE, ISBN: 9786185304416

13625 ΒΑΣΙΚΕΣ ΑΡΧΕΣ ΤΕΧΝΟΛΟΓΙΑΣ ΛΟΓΙΣΜΙΚΟΥ, Τύπος: Σύγγραμμα, IAN SOMMERVILLE, 2009, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-220-8

Additional material

7th Semester

BUSINESS DATA COMMUNICATIONS (ΠΛ0731) - TM

Coordinator: Psannis Konstantinos

Semester: 7th (Winter) | **Course type: Elective TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Psannis Konstantinos*

General competences

Business Data Communications and their Applications

Course content

Data Communications for Enterprise, Convergence and Unified Communications, Business Information Requirements, Transmission of Information, Distributed Data Processing, Business Information (Audio, Data, Image, Video), Data Transmission, Signals for Conveying Information, Transmission Media, Transmission Impairments, Communications Channels, Channel capacity, Shannon bound, Nyquist Bandwidth, Data Communication Fundamentals, Analog and Digital Data Communications, Data Encoding Techniques, Flow Control and Error Control, Asynchronous and Synchronous Transmission, Error Detection, Multiplexing, Telecommunications Products , Standards, Performance Parameters of Coding and Modulation Scheme, Data Communication Services for Enterprises, Quality of Services, Quality of Experience), Multimedia Applications for Enterprises Internet Operation Quality of Service, Quality of Experience, Business Data Communications : Case Studies (Internet of things, Cloud-based Data Communications, Convergence and Unified Communications)

Assessment

Written final examination 60%

Compulsory assignment/lab tests 40%

Course bibliography

(One of the following):

22769688 ΒΑΣΙΚΕΣ ΑΡΧΕΣ ΣΥΣΤΗΜΑΤΩΝ ΕΠΙΚΟΙΝΩΝΙΑΣ, Τύπος: Σύγγραμμα, MICHAEL P. FITZ, 2012, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-515-5

77107676 Επικοινωνίες υπολογιστών και δεδομένων, 10η Έκδοση, Τύπος: Σύγγραμμα, Stallings William, Κατσαβούνης Στέφανος (επιμέλεια), 2018, ΤΖΙΟΛΑ, ISBN: 978-960-418-814-7

3235 ΑΛΓΟΡΙΘΜΟΙ & ΕΦΑΡΜΟΓΕΣ ΣΥΣΤΗΜΑΤΩΝ ΕΠΙΚΟΙΝΩΝΙΩΝ ΤΟΜΟΣ 1:ΣΗΜΑΤΑ & ΣΥΣΤΗΜΑΤΑ, Τύπος: Σύγγραμμα, NEVIO BENVENUTO,GIOVANNI CHERUBINI, 2004, ΕΚΔΟΣΕΙΣ ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΠΑΤΡΩΝ, ISBN: 960-530-065-5

33197231 Ψηφιακά Συστήματα Επικοινωνιών, Τύπος: Σύγγραμμα, Simon Haykin, 2014, Παπασωτηρίου, ISBN: 978-960-491-088-5

50658783 Cloud Computing Αρχές, Τεχνολογία και Αρχιτεκτονική 1η Εκδ., Τύπος: Σύγγραμμα, Ricardo Puttini, Thomas Erl, Zaigham Mahmood, 2015, Χ. ΓΚΙΟΥΡΔΑ ΣΙΑ ΕΕ, ISBN: 978-960-512-6865

13753 ΕΠΙΧΕΙΡΗΣΙΑΚΗ ΔΙΑΔΙΚΤΥΩΣΗ, Τύπος: Σύγγραμμα, ΓΙΩΡΓΟΣ ΔΙΑΚΟΝΙΚΟΛΑΟΥ, ΑΘΑΝΑΣΙΑ ΑΓΙΑΚΑΤΣΙΚΑ, ΗΛΙΑΣ ΜΠΟΥΡΑΣ, 2007, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-062-4

Additional material

ebooks, papers, Demonstrations, Virtual Labs , Experiments (http://compus.uom.gr) (1. Korte B. & Vygen J., Combinatorial Optimization: Theory and Algorithms, 4th ed., Springer-Verlag Berlin Heidelberg, Series: Algorithms and Combinatorics (Vol. 21), 2007.

2. Lee J., A First Course in Combinatorial Optimization, Series: Cambri)

BUSINESS INNOVATION AND PRODUCTIVITY (ΠΛ0611-3) - AI

Coordinator: Vlachopoulou Maro

Semester: 7th (Winter) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Vlachopoulou Maro, Stiakakis Emmanuil*

General competences

(a) To investigate business innovation as competitive advantage source, (b) to acquire knowledge with regard to productivity, (c) to comprehend the way in which innovation development and productivity increase contribute to competitiveness improvement of businesses.ContentIntroduction to the concepts of business innovation and productivity,New economy and innovation management (the importance of innovation management, the determinants of innovation, characteristics of an innovative company in the new economy),Technology, innovation, and economy (knowledge economy, the importance of technology in innovation development, technological progress, innovation and economic development),Productivity measurement methods (business inputs and outputs, methods and techniques for the measurement of productivity at micro level),Innovation and productivity as competitiveness empowerment tools (competitive advantage, competitiveness in the new economy, the ways in which innovation development and productivity increase contribute to competitive advantage establishment).

Course content

Assessment

Compulsory assignment 100%

Course bibliography

(One of the following):

14035 ΚΑΙΝΟΤΟΜΙΑ, ΣΤΡΑΤΗΓΙΚΗ, ΑΝΑΠΤΥΞΗ ΚΑ ΠΛΗΡΟΦΟΡΙΑΚΑ ΣΥΣΤΗΜΑΤΑ, Τύπος: Σύγγραμμα, Γεώργιος Δουκίδης, 2010, ΑΝΔΡΕΑΣ ΣΙΔΕΡΗΣ - ΙΩΑΝΝΗΣ ΣΙΔΕΡΗΣ & ΣΙΑ Ο.Ε., ISBN: 978-960-08-0528-4

32998194 Καινοτομία και αλλαγή στο επιχειρείν, Τύπος: Σύγγραμμα, Ελένη Ε. Σαλαβού, 2013, Εκδοτικός Οίκος Rosili, ISBN: 978-960-7745-31-6

11600 Η στρατηγική διαχείριση της τεχνολογίας και της καινοτομίας, Τύπος: Σύγγραμμα, White Margaret A.,Bruton Garry D., 2010, Κριτική, ISBN: 978-960-218-674-9

Additional material

Καραγιάννης, Η. Καινοτομία & Επιχειρηματικότητα: Θεωρία πράξη, Αθήνα: Σοφία Α.Ε., 2010

Burgelman, R.; Christensen, C. Wheelwright Strategic Management of Technology and Innovation, Boston, USA: McGraw-Hill, 2008 (Καραγιάννης, Η. Καινοτομία & Επιχειρηματικότητα: Θεωρία πράξη, Αθήνα: Σοφία Α.Ε., 2010

Burgelman, R.; Christensen, C. Wheelwright Strategic Management of Technology and Innovation, Boston, USA: McGraw-Hill, 2008)

BUSINESS MODELLING (ΠΛ0738) - TM

Coordinator: Vergidis Konstantinos

Semester: **7th** (Winter) | **Course type:** **Elective TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Vergidis Konstantinos*

General competences

During the course, students become familiarized with theories, principles, methodologies, tools and use cases related to Business Modelling (BM). The BM area is placed vis-a-vis Model Driven Architecture and Design (MDA/MDD) as well as to the relevant courses of Enterprise Architectures and Information Systems Analysis and Design. The course focuses on process and data modelling. Several formalisms and tools are presented. Real world use cases will be analyzed and process/data models will be drafted by the students.

Course content

Assessment

Midterm tests 50%

Coursework 50%

Course bibliography

(One of the following):

22769685 ΔΙΑΧΕΙΡΙΣΗ ΕΠΙΧΕΙΡΗΣΙΑΚΩΝ ΔΙΑΔΙΚΑΣΙΩΝ: ΟΡΓΑΝΩΣΗ, ΑΝΑΔΙΟΡΓΑΝΩΣΗ ΚΑΙ ΒΕΛΤΙΩΣΗ, Τύπος: Σύγγραμμα, ΝΙΚΟΛΑΟΣ Α. ΠΑΝΑΓΙΩΤΟΥ, ΝΙΚΟΛΑΟΣ ΕΥΑΓΓΕΛΟΠΟΥΛΟΣ, ΠΕΤΡΟΣ ΚΑΤΗΜΕΡΤΖΟΓΛΟΥ, ΣΩΤΗΡΗΣ ΓΚΑΓΙΑΛΗΣ, 2013, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-516-2

77106790 Διαχείριση Επιχειρησιακών Διαδικασιών, 2η Έκδοση, Τύπος: Σύγγραμμα, Weske Mathias, Μάρω Βλαχοπούλου, Κωνσταντίνος Βεργίδης (επιμέλεια), 2018, ΤΖΙΟΛΑ, ISBN: 978-960-418-794-2

Additional material

(Οι διαφάνειες του μαθήματος, χρήσιμοι σύνδεσμοι (links) καθώς και επιπρόσθετο υλικό θα γίνεται διαθέσιμο μέσω της πλατφόρμας compus.)

COMPUTATION THEORY AND AUTOMATA (ΠΛ0506-1) - AI

Coordinator: Refanidis Ioannis

Semester: **7th** (Winter) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Refanidis Ioannis*

General competences

To be able (a) to recognize abstract models of computation (b) to identify various classes of computational problems (c) to formally describe problems.

Course content

Alphabets and languages. Regular expressions. Regular languages. Non-regular languages. Context-free grammars. Context-sensitive grammars. Automata. Finite automata. Deterministic and non-deterministic automata. Push-down automata. Turing machines. Church thesis. Turing decidable and acceptable languages. Universal Turing machine. Non-computability. Non-solvable problems. Complexity classes. Problem reduction. P, NP, NP complete classes.

Assessment

Final examination 100%.

Optional homework up to an additional 30%

Course bibliography

(One of the following):

Elements of the Theory of Computation, Harry R Lewis and Christos H Papadimitriou, 2nd edition, 1997, Prentice Hall.

Introduction to the Theory of Computation, Michael Sipser 2005, Course Technology.

Additional material

Lecture slides, exemplary solved exercises. (http://compus.uom.gr/INF201/index.php)

COMPUTERIZED ACCOUNTING (ΠΛ0803) - TM

Coordinator: Vazakidis Athanasios

Semester: **7th** (Winter) | **Course type:** **Elective TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Vazakidis Athanasios, Stavropoulos Antonios*

General competences

Course content

Assessment

Written final examination 100%

Optional coursework up to 30%

Course bibliography

(One of the following):

6717 Λογιστικά Πληροφοριακά Συστήματα Μηχανογραφημένη Λογιστική, Τύπος: Σύγγραμμα, Δ. Γκίνογλου, Π. Ταχυνάκης, Ν. Πρωτόγερος, 2004, Εκδοτικός Οίκος Rosili, ISBN: 960-7745-09-4

Additional material

(Σημειώσεις και διαφάνειες μαθήματος.)

CRYPTOGRAPHY (ΠΛ0618) - AI

Coordinator: Petridou Sofia

Semester: 7th (Winter) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Petridou Sofia*

General competences

Introduction to modern cryptology.

Course content

Classical cryptography - simple cryptosystems. Cryptanalysis. Cryptographic hash functions. Symmetric cryptography. Asymmetric cryptography. Key management. Digital signatures. Cryptographic protocols.

Assessment

Coursework - Oral examination

Course bibliography

(One of the following):

1746 ΤΕΧΝΙΚΕΣ ΚΡΥΠΤΟΓΡΑΦΙΑΣ & ΚΡΥΠΤΑΝΑΛΥΣΗΣ, Τύπος: Σύγγραμμα, ΚΑΤΟΣ Β., ΣΤΕΦΑΝΙΔΗΣ Γ., 2003, ΖΥΓΟΣ, ISBN: 960-8065-40-2

11068 Κρυπτογραφία, Τύπος: Σύγγραμμα, Πουλάκης Δημήτριος Μ., 2004, Ζήτη, ISBN: 960-431-926-4

Additional material

(Σημειώσεις και διαφάνειες μαθήματος.)

DIGITAL SYSTEMS' DESIGN AND PROGRAMMING (ΠΛ0742) - TM

Coordinator: Kaskalis Theodoros

Semester: 7th (Winter) | **Course type: Elective TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Kaskalis Theodoros*

General competences

Elective module subject aiming to provide full understanding about the process of producing and programming digital systems, from the phase of the initial concept idea to the point of the final product programming.

Course content

Digital systems' development: rationale, methodology and characteristics. Common practice methods, life cycle, practical matters regarding the necessary human resources and hardware infrastructure. Prototype development through FPGAs and microcontrollers. Schematic and PCB design through EDA tools. Enclosure design through CAD modelling tools. PCB and final product ordering and assembling. Microcontroller programming in C and assembly. Physical computing and issues of Human-Computer Interfacing. Development boards and kits and real-life prototype production.

Assessment

Midterm tests, final coursework, final examination

Course bibliography

(One of the following):

45471 Συστήματα Μικροϋπολογιστών, ΤΟΜΟΣ ΙΙ: Μικροελεγκτές AVR και PIC, Τύπος: Σύγγραμμα, Τόμος: Τόμος 2, Πεκμεστζή Κιαμάλ, 2009, Συμμετρία, ISBN: 978-960-266-269-4

33147 Ηλεκτρονική σχεδίαση-κατασκευή & προσομοίωση τυπωμένων κυκλωμάτων, Τύπος: Σύγγραμμα, Χατζηγκάιδας Α., Κουτσινού Μ., 2010, Α. Χατζηγκάιδας, ISBN: 978-960-92653-4-8

Additional material

(Διαφάνειες μαθήματος, Προτεινόμενα sites, ιστοσελίδα μαθήματος (http://compus.uom.gr/MT184))

DISTRIBUTED SYSTEMS (ΠΛ0809) - AI

Coordinator: Margaritis Konstantinos

Semester: **7th** (Winter) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Margaritis Konstantinos*

General competences

• Explain the advantages and disadvantages, benefits and complications of distributed systems.

• Explain why concurrent programming algorithms and structures are not sufficient in distributed systems and description of suitable alternatives.

• Describe the relative advantages and disadvantages of optimistic versus conservative concurrency control.

• Distinguish several types of faults in a distributed system as well as possible remedy strategies.

• Explain the trade-offs among overhead, consistency, replication, scalability, and fault tolerance for a given distributed system.

• Evaluate the observed throughput, initial and response latency across hosts in a given distributed system.

• Write programs that perform data marshaling and conversion into message units, to communicate complex data between two hosts.

• Implement a full server, for example, a spell checking service.

• Design and implement a small scale distributed system employing several modern technologies.

Course content

• Introductiom, Processes, Services and Communication

• Architecture and Design of Dustributed Systems

• Distributed Messaging, Naming

• Timing, Synchronization, Transactions, Election

• Consistency, Replication

• Fault Tolerance, Load Balancing, Security

• Distributed Object-Based Systems

• Distributed File Systems

• Distributed Web-Based Systems

• Distributed Coordination-Based Systems

• Modern Distributed Systems Case Studies

Assessment

• Laboratoty Exercises

• Written Examination

Course bibliography

(One of the following):

12533080 ΚΑΤΑΝΕΜΗΜΕΝΑ ΣΥΣΤΗΜΑΤΑ ΜΕ JAVA, Τύπος: Σύγγραμμα, Ι. Κ. ΚΑΒΟΥΡΑΣ, Ι. Ζ. ΜΗΛΗΣ, Α. Α. ΡΟΥΚΟΥΝΑΚΗ, Γ. Β. ΞΥΛΩΜΕΝΟΣ, 2011, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-463-9

13777 ΚΑΤΑΝΕΜΗΜΕΝΑ ΣΥΣΤΗΜΑΤΑ: ΑΡΧΕΣ ΚΑΙ ΥΠΟΔΕΙΓΜΑΤΑ, Τύπος: Σύγγραμμα, ANDREW S. TANENBAUM, MAARTEN VAN STEEN, 2006, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-924-0

4621 ΚΑΤΑΝΕΜΗΜΕΝΕΣ ΕΦΑΡΜΟΓΕΣ ΚΑΙ ΗΛΕΚΤΡΟΝΙΚΟ ΕΜΠΟΡΙΟ (ΠΕΡΙΕΧΕΙ CD), Τύπος: Σύγγραμμα, INCE DARREL, 2007, ΕΚΔΟΣΕΙΣ ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΜΑΚΕΔΟΝΙΑΣ, ISBN: 978-960-8396-34-0

Additional material

Course website (Ιστότοπος μαθήματος (http://compus.uom.gr/INF121/))

ELECTRONIC GOVERNANCE (ΠΛ0840) - AI-TM

Coordinator: Tambouris Efthimios

Semester: 7th (Winter) | **Course type: Elective AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Tambouris Efthimios*

General competences

This course aims at developing the following skills and competences:

- decision making
- organizational, collaborative learning
- presentation and defense of positions
- writing skills
- teamwork
- evaluation and self-evaluation

After completing the course students will be able to:

- understand the role and capabilities of implementing Information Systems in the Public Sector
- use eGovernment and eParticipation applications
- develop simple applications based on linked open government data

Course content

The structure of the course includes the following main subject areas:

- Introduction to eGovernment
- Open Government Data and Linked Open Data
- Provision of Public Information and Services
- One-stop Government
- Interoperability
- eParticipation

Assessment

Student assessment is based on 2 main criteria with the corresponding gravity ratios:

- Final Examination: 50%
- Project s: 50%

Students are informed about the obligations, policy and requirements of the six-month group work (3-4 students). Students are invited to create applications and/or analyze "hidden" Open-Data and publish a relevant data story. In addition, there are individual tasks on issues of eParticipation, one-stop Government etc.

At the beginning of the semester, instructions, technical specifications, as well as the way of evaluating of projects are announced.

Exam and Project grades are announced on Compus (and/or additional Learning Management Systems) as an additional feedback element on the final performance of the students.

Course bibliography

(One of the following):

Greek bibliography

Αποστολάκης Ι., Λουκής Ε., Χάλαρης Ι., Ηλεκτρονική Δημόσια Διοίκηση – Οργάνωση, Τεχνολογία και εφαρμογές, Εκδ. Παπαζήση, 2008

Πομπόρτσης, Α. Εισαγωγή στην ηλεκτρονική διακυβέρνηση (e-government) : ο μετασχηματισμός των λειτουργιών και υπηρεσιών της δημόσιας διοίκησης στην ψηφιακή εποχή : ανάλυση, σχεδιασμός, εφαρμογές, διαχείριση, βέλτιστες πρακτικές. Εκδόσεις Τζιόλα, c2005.

Στεφανιδάκης, Μ., Ανδρόνικος, Θ., Παπαδάκης, Ι., 2015. Ανοικτά συνδεδεμένα δεδομένα και εφαρμογές. [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: http://hdl.handle.net/11419/1338

Additional material

Notes and Tutorials for all applications used within the course.

ETHICS AND GOVERNANCE OF ARTIFICIAL INTELLIGENCE (AIE710) - AI-TM

Coordinator: Alexiadou Anastasia-Sofia

Semester: 7th (Winter) | **Course type: Elective AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Alexiadou Anastasia-Sofia*

General competences

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

• Recall and critically evaluate significant areas of the sciences, such as algorithm and data bias, autonomous vehicles, prosthetics and robotics, development of new (intelligent) life forms, etc.

• Identify and assess the ethical issues raised by Artificial Intelligence and its strengths and weaknesses,

• Reflect on the philosophical issues raised by Artificial Intelligence in relation to what life is and what makes us humans,

• Conceptualize and analyze the legal, economic, and social impact of the rapid evolution of Artificial Intelligence,

• Explore the balance between innovation and regulation as well as between governance of technology in relation to basic human rights

This course aims, inter alia, at the development of the following general skills and competences:

• Promotion of free, creative and inductive thinking

• Demonstrating social, professional and ethical responsibility and sensitivity

• Critical thinking about the evolution of technology and its potential impact on humanity

Course content

The advances in technology have placed human existence at a pivotal point. Artificial Intelligence will, soon, take over for us, inter alia, the control of our economy, security, infrastructure, health, nutrition, and transportation, as well as the support of several of our personal activities. At the same time, research is being rapidly carried out in order to integrate non-organic elements into human body, but also to map brain function.

Such technological advancement raises a number of philosophical and ethical issues, calls to the conceptualization of its wider implication and of its proper regulation and governance. Throughout the course we will discuss leading issues in this field: What makes us human? How do we ensure that the benefits of technology are fairly shared? How do we strike a balance between innovation and regulation? How do we ensure that these systems make ethical decisions when technological evolutions take place so promptly and markedly?

The structure of the course includes the following main subjects:

• Introduction to Philosophy and Ethics

• Introduction to the strengths of technology (mainly Artificial Intelligence): Algorithm and data bias, Autonomous vehicles, Forecasting, etc.

• Philosophical questions around the application of Artificial Intelligence (e.g. Can a machine have a mind?)

• Ethical reasoning to issues raised by Artificial Intelligence (e.g. How can we ensure "ethical algorithms" and systems, e.g. by using the privacy-by-design principle?)

• Legal Implications of Artificial Intelligence (e.g. How legal reasoning can be applied to questions related to crimes committed by robots or the decisions they make when human lives are at risk?)

• Social Implications of Artificial Intelligence (e.g. Will the benefits of technology be fairly shared?)

• Economic Implications of Artificial Intelligence (e.g. What is the balance between innovation and regulation?)

• Artificial Intelligence Governance (e.g. How can we monitor and evaluate the progress and the use of its results? What kind of policy interventions are required?)

Assessment

Required work and form of assessment:

• Preparation and Class participation

• Research Paper (optional)

• Final Written Exams

Course bibliography

(One of the following):

GAME THEORY (ΠΛ0722) - AI

Coordinator: Refanidis Ioannis

Semester: **7th** (Winter) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Refanidis Ioannis*

General competences

To be able to (a) recognize and model game situations, (b) solve games through the identification of Nash equilibriums, (c) use Game Theory to interpret real-world situations.

Course content

Game representation. Normal/Strategic form. Extended form. Strategies. Domination and its resolution. Nash equilibrium. Cournot duopoly. Cartels. The commons tragedy. Mixed strategies. Expected utility. Risk aversion. Games with non-concurrent actions. Backward induction. Perfect Nash equilibrium for subgames. Repeated games. Finite and infinite games. Firing strategies. Lenient strategies. The common theorem. Dynamic games.Moral hazard. Incentives theories. Games with incomplete information. Bayes-Nash equilibrium. Mechanism design. Revelation principle. Auctions. Algorithmic Game Theory. Game Theory and Social Networks.

Assessment

Written final examination 100%

Optional homework up to an additional 30%

Course bibliography

(One of the following):

An Introduction to Game Theory. Martin J. Osborne, 2003. Oxford University Press.

Additional material

Lecture slides, exemplary solved exercises. (http://compus.uom.gr/INF201/index.php)

INFORMATION RETRIEVAL AND SEARCH ENGINES (ΠΛ0734) - AI-TM

Coordinator: Koloniari Georgia

Semester: **7th** (Winter) | **Course type:** **Elective AI-TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Koloniari Georgia*

General competences

The goal of this course is for students to learn and study the algorithms, methods and applications that are used in information retrieval from text-based files and also in search engines at the web.

Course content

Introduction to information retrieval

Information retrieval models (boolean, vector space model, probabilistic)

Evaluation (feedback, accuracy, relevance)

Indexing (inverted lists, signature files)

Index compression

Relevance feedback

Text clustering and classification

Introduction to web search

Retrieval of XML data

Link analysis (PageRank, Hits)

Web crawlers, feeds and indexes

Social search

Assessment

Project 30%

Exercises 20%

Written exams 50%

Course bibliography

(One of the following):

12532681 ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΑΝΑΚΤΗΣΗ ΠΛΗΡΟΦΟΡΙΩΝ, Τύπος: Σύγγραμμα, CHRISTOPHER D. MANNING, PRABHAKAR RAGHAVAN, HINRICH SCHUTZE, 2012, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-456-1

41954965 Ανάκτηση Πληροφορίας, 2η Έκδοση, Τύπος: Σύγγραμμα, Baeza-Yates Ricardo, Ribeiro-Neto Berthier, 2014, ΤΖΙΟΛΑ, ISBN: 978-960-418-460-6

7753 Η ΜΕΘΟΔΟΣ PAGERANK ΤΗΣ GOOGLE ΚΑΙ ΑΛΛΑ ΣΥΣΤΗΜΑΤΑ ΚΑΤΑΤΑΞΗΣ ΙΣΤΟΣΕΛΙΔΩΝ, Τύπος: Σύγγραμμα, LANGVILLE AMY, MEYER CARL, 2010, ΙΤΕ-ΠΑΝΕΠΙΣΤΗΜΙΑΚΕΣ ΕΚΔΟΣΕΙΣ ΚΡΗΤΗΣ, ISBN: 978-960-524-313-5

320300 ΑΝΑΚΤΗΣΗ ΠΛΗΡΟΦΟΡΙΑΣ, Τύπος: Ηλεκτρονικό Βιβλίο, ΑΠΟΣΤΟΛΟΣ ΠΑΠΑΔΟΠΟΥΛΟΣ, ΙΩΑΝΝΗΣ ΜΑΝΩΛΟΠΟΥΛΟΣ, ΚΩΣΝΤΑΝΤΙΝΟΣ ΤΣΙΧΛΑΣ, Ελληνικά Ακαδημαϊκά Ηλεκτρονικά Συγγράμματα και Βοηθήματα - Αποθετήριο "Κάλλιπος", ISBN: 978-960-603-457-2

Additional material

Course website. (http://compus.uom.gr/INF285/index.php)

INNOVATIVE SERVICE AND PRODUCT DEVELOPMENT (ΠΛ0740) - TM

Coordinator: Kitsios Fotios

Semester: **7th** (Winter) | **Course type:** **Elective TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Kitsios Fwtios*

General competences

The importance of new products and services, organization for new products and services, parallel parallel mechanics, product planning, customer demands, products and services specifications, generation and benchmarking of new ideas, product architecture, designing and manufacturing technologies, product life cycle management, promotion and advertisement of new products and services. Cases analysis.

Course content

Assessment

Final examination 60%

Coursework and oral examination 40%

Course bibliography

(One of the following):

68389614 Στρατηγική Διοίκηση Καινοτομίας, Τύπος: Σύγγραμμα, Tidd Joe, Bessant John, 2017, BROKEN HILL PUBLISHERS LTD, ISBN: 9789963274703

13595 ΑΝΑΠΤΥΞΗ ΝΕΩΝ ΥΠΗΡΕΣΙΩΝ: ΤΟΥΡΙΣΜΟΣ - ΥΓΕΙΑ - ΕΠΙΧΕΙΡΗΜΑΤΙΚΟΤΗΤΑ - ΚΑΙΝΟΤΟΜΙΑ, Τύπος: Σύγγραμμα, ΦΩΤΗΣ Χ. ΚΙΤΣΙΟΣ, ΚΩΝΣΤΑΝΤΙΝΟΣ ΖΟΠΟΥΝΙΔΗΣ, 2008, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-119-5

59391294 Η Στρατηγική Διοίκηση της Τεχνολογικής Καινοτομίας, Τύπος: Σύγγραμμα, Schilling A. Melissa, 2016, BROKEN HILL PUBLISHERS LTD, ISBN: 9789963258864

22630 Αποτελεσματική διοίκηση χαρτοφυλακίου προϊόντων και υπηρεσιών, Τύπος: Σύγγραμμα, Αυλωνίτης Γεώργιος Ι., Παπασταθοπούλου Πολίνα, 2004, Σταμούλη Α.Ε., ISBN: 960-351-518-3

50657960 Μάρκετινγκ Υπηρεσιών, Τύπος: Σύγγραμμα, Αυλωνίτης Γ.,Τσιότσου Ρ.,Γούναρης Σ., 2015, BROKEN HILL PUBLISHERS LTD, ISBN: 9789963258567

18548838 Σχεδιασμός και Ανάπτυξη Προϊόντων, Τύπος: Σύγγραμμα, Ulrich K., Eppinger S., 2015, ΤΖΙΟΛΑ, ISBN: 978-960-418-489-7

Additional material

INTERNET LAW (ΠΛ0725) - AI-TM

Coordinator: Milossi Maria

Semester: **7th** (Winter) | **Course type:** **Elective AI-TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Milossi Maria*

General competences

The lesson aims to familiarize students with the basic legal framework related to the Internet. It concerns the rights and obligations of Internet users, the enforcement of legal sanctions in the case of infringement of this, as well as the role of the Internet as a means of communication.

Course content

The content concentrates on: the basic legal framework related to e-communications and more specifically to the Internet ; the confidentiality of e-communications; personal data protection in e-communications; legal issues concerning blogs and social networks; domain names; copyright and the Internet; e-crime; e-government

Assessment

Final examination.

Optional coursework

Course bibliography

(One of the following):

25153 Το δίκαιο του διαδικτύου (internet), Τύπος: Σύγγραμμα, Σιδηρόπουλος Θεόδωρος, 2008, Σάκκουλας Εκδόσεις Ε.Ε., ISBN: 978-960-445-377-1

1481 Δίκαιο & Internet, Τύπος: Σύγγραμμα, Καράκωστας Κ. Ιωάννης, 2009, Δίκαιο και Οικονομία - Π. Ν. Σάκκουλα, ISBN: 978-960-420-400-7

Additional material

KNOWLEDGE DISCOVERY FROM DATABASES (ΠΛ0823) - AI

Coordinator: Evangelidis Georgios

Semester: **7th** (Winter) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Evangelidis Georgios*

General competences

The student will be able to:

(a) understand the concepts behind knowledge discovery from databases,

(b) learn how to design Data Warehouses and apply OLAP analysis on multidimensional cubes,

(c) understand and learn how to apply data mining techniques like classification, clustering, association rules using well established tools (e.g., WEKA).

Course content

Introduction to knowledge discovery from databases concepts - Data Warehousing - Multidimensional cubes - OLAP - Data Mining concepts - Classification - Clustering - Association Rules.

Assessment

Course bibliography

(One of the following):

13748 ΕΞΟΡΥΞΗ ΠΛΗΡΟΦΟΡΙΑΣ: ΕΝΑΣ ΕΙΣΑΓΩΓΙΚΟΣ ΟΔΗΓΟΣ ΜΕ ΠΑΡΑΔΕΙΓΜΑΤΑ, Τύπος: Σύγγραμμα, RICHARD J. ROIGER, MICHAEL W. GEATZ, 2008, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-206-2

22768468 Εξόρυξη από Μεγάλα Σύνολα Δεδομένων, Τύπος: Σύγγραμμα, Anand Rajaraman, Jeffrey David Ullman, 2014, Εκδόσεις Νέων Τεχνολογιών, ISBN: 978-960-6759-83-3

18549105 Εισαγωγή στην εξόρυξη δεδομένων, Τύπος: Σύγγραμμα, Tan Pang - Ning,Steinbach Michael,Kumar Vipin, 2010, ΤΖΙΟΛΑ, ISBN: 978-960-418-162-9

Additional material

MOBILE APPLICATION DEVELOPMENT (ΠΛ0733) - AI-TM

Coordinator: Chaikalis Theodoros

Semester: **7th** (Winter) | **Course type:** **Elective AI-TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Chaikalis Theodoros*

General competences

The in-depth understanding of the way that mobile software works and the acquisition of skills on the domain of mobile programming.

Course content

1. Introduction to mobile devices
2. Presentation of android platform
3. Advanced topics on android architecture
4. Graphical user interface on mobile devices
5. Local storage management
6. Advanced topics on local storage management and database management
7. Multimedia (Sound and Video) management
8. Web services

Assessment

50% Group development project

50% Exams

Course bibliography

(One of the following):

41960295 Android Προγραμματισμός, 2η Εκδοση, Τύπος: Σύγγραμμα, Paul Deitel, Harvey Deitel, Abbey Deitel, 2014, Χ. ΓΚΙΟΥΡΔΑ & ΣΙΑ ΕΕ, ISBN: 978-960-512-6780

41954973 Εισαγωγή στο Προγραμματισμό Android, Τύπος: Σύγγραμμα, Έλληνας Ιωάννης- Έλληνας Νικόλαος, 2014, ΤΖΙΟΛΑ, ISBN: 978-960-418-453-8

Additional material

(http://compus.uom.gr/MT199/index.php)

NETWORKS AND WEB APPLICATIONS SECURITY (ΠΛ0825) - AI

Coordinator: Mavridis Ioannis

Semester: **7th** (Winter) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Mavridis Ioannis*

General competences

The student will (a) gain familiarity with protection requirements of modern information and communication systems, (b) learn the fundamental cryptology-based techniques for securing data processing and transmission over the Internet, (c) acquire experience on applying the above techniques in laboratory conditions.ContentBasic concepts (Network and Internet security issues, Types of attacks and countermeasures, Comparison of security technologies)Introduction to Cryptography (Terminology, Types of cryptographic systems and features of their components, Key-stream generators)Classic Cryptographic Algorithms and Cryptanalysis (Caesar, Vigenere, One Time Pad / Vernam, ROT13, Transposition algorithms, Substitution algorithms, Application examples with CRYPTOOL)Modern Symmetric Cryptographic Algorithms and Cryptanalysis (DES, 3-DES, AES, IDEA, RC2, RC4, etc, Modes of Operation (ECB, CBC, OFB, CFB), Application examples with CRYPTOOL)Modern Asymmetric Cryptographic Algorithms and Cryptanalysis (Diffie-Hellman, ECDH, RSA, ECC, Application examples with CRYPTOOL)Integrity Mechanisms (CBC-MAC, HMAC, OWHF, CRHF, MD5, SHA, DSA, ECDSA, etc, Application examples with CRYPTOOL)Applications of Cryptography (message digests, digital signatures, digital certificates, etc)Certification Infrastructures (Components and Features of Public Key Infrastructures - PKIs)Protection of Digital Communications (S/MIME, PGP, Kerberos, SSL/TLS, IPsec, etc)Protocols for Secure Transactions over the Internet (eCash, CAFE, NetCash, CyberCoin, CyberCash, iKP, SET, etc)Wired Network and Web Applications Security (Issues, Critical vulnerabilities, Types of attacks, Case studies)Firewalls and IDSs (Kinds of mechanisms, Architectures, Case studies)Wireless Network security (Operational features and security issues, Protection mechanisms and protocols (WEP, WPA, IEEE 802.11i, etc), Techniques and types of attacks, Case studies)

Course content

Assessment

Written final examination 60%

Optional coursework up to 40%

Course bibliography

(One of the following):

5425 ΑΣΦΑΛΕΙΑ ΠΛΗΡΟΦΟΡΙΑΚΩΝ ΣΥΣΤΗΜΑΤΩΝ, Τύπος: Σύγγραμμα, ΠΑΓΚΑΛΟΣ ΓΕΩΡΓΙΟΣ,ΜΑΥΡΙΔΗΣ Ι., 2002, ΑΝΙΚΟΥΛΑ, ISBN: 9605160188

9675 Ασφάλεια Δικτύων Υπολογιστών, Τύπος: Σύγγραμμα, Γκρίτζαλης Στέφανος,Γκρίτζαλης Δημήτρης Α.,Κάτσικας Σωκράτης, 2003, Παπασωτηρίου, ISBN: 978-960-7530-45-5

Additional material

Instructor's notes and slides

8th Semester

FINANCIAL RISKS MANAGEMENT (ISE801) - TM

Coordinator: Dasilas Apostolos

Semester: 8th (Spring) | **Course type: Elective TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Dasilas Apostolos*

General competences

The general cometences of the module are:

1) to seek, analyse and synthesize data and information with the help of necessary technologies 2) to make decision making

3) to produce new research ideas

4) to get the atmoshere of international work

Course content

1. Risks of Financial Intermediation
2. Interest rate risk
3. Credit Risk
4. Liquidity Risk
5. Foreign Exchange Risk
6. Sovereign Risk
7. Market Risk
8. Off-Balance-Sheet Risk
9. Technology and Other Operational Risks
10. Deposit Insurance and Other Liability Gurantees
11. Capital Adequacy
12. Securitizition and Loan Sales

Assessment

Written final examination: 100%

Course bibliography

(One of the following):

68373099, Διοίκηση Χρηματοπιστωτικών Ιδρυμάτων και Διαχείριση Κινδύνων, Τύπος: Σύγγραμμα, Saunders Anthony, Cornett Marcia, 2017, Εκδόσεις Broken Hill,ISBN: 9789963274383

77119047, Διαχείριση Κινδύνων και Διαχείριση Χαρτοφυλακίου, Τύπος: Σύγγραμμα, Κιόχος Πέτρος, Παναγόπουλος Αναστάσιος, Κυρμίζογλου Παντελής, Εκδόσεις Ελένη Κιόχου, ISBN: 978 - 618 - 81412 - 4 - 7

Additional material

ADVANCED INFORMATION SYSTEMS (ΠΛ0741) - TM

Coordinator: Tambouris Efthimios

Semester: 8th (Spring) | **Course type: Elective TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Tambouris Efthimios*

General competences

This course aims at developing the following skills and competences:

- solving business problems and exploiting opportunities
- decision making
- organizational, collaborative learning
- presentation and defense of positions
- writing skills
- teamwork
- evaluation and self-evaluation

After completing the course students will be able to:

- know what is Open Data
- obtain Open Data
- visualize Open Data
- make decisions about the use of Open Data
- use software to retrieve, modify, and visualize Open Data

Course content

The course aims to equip students with sufficient understanding of the importance of (Advanced) Information Systems (IS) in order to solve business problems and exploit new opportunities to achieve competitive advantage. The course will focus on the use of big data and especially of open data.

The structure of the course includes the following main subject areas:

- Definitions, benefits and challenges of Open Data
- Open Data recovery
- Open Data visualization
- Open Data analysis
- Problem and analysis presentations
- Open Data advanced topics
- Summary - general conclusions

Assessment

Student assessment is based on 2 main criteria with the corresponding gravity ratios:

- Final Examination: 50%
- Project of 3-4 students (Interim Reports / Progress Presentations, Deliverables, Final Report): 50%

Students are informed about the obligations, the policy and the requirements of the group work (project preparation and regular progress checks / class presentations). Students are invited to create a data story that will highlight the value of Open Data.

In particular, they should find and retrieve proper Open Data, visualize the selected Open Data, make analyzes that highlight the value of Open Data, and finally write (and perhaps publish on a relevant blog) a relevant data story.

In the beginning of the semester, instructions, technical specifications, as well as the way of evaluating of projects are announced. All teams are invited to submit their progress at predefined dates and they are also invited to make presentations during the course.

Exam and Project grades are announced on Compus (and/or other Learning Management System) as an additional feedback element on the final performance of the students.

Course bibliography

(One of the following):

Greek bibliography

Πληροφοριακά Συστήματα Παγκοσμίου Ιστού, Α. Βακάλη – Ζ. Παπαμήτσιου,2012, Εκδ. Νέων

BIG DATA MINING (ΠΛ0833) - AI-TM

Coordinator: Karakasidis Alexandros

Semester: 8th (Spring) | **Course type: Elective AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Karakasidis Alexandros*

General competences

The lesson focuses on learning the management of Big Data. After the successful completion of the course, the students will be able to:

• Identify the sources and the characteristics of Big Data and how these characteristics affect Big Data management.

• Use the existing Big Data management platforms.

• Apply programming concepts, structures and techniques for Big Data management.

• Design algorithms appropriate for Big data analysis

• Use Python programming language for data analysis.

• Use basic existing algorithms for Big Sata analysis

• Identify the type of a Big Data analysis problem and select appropriate algorithms

• Desing algorithms appropriate for execution on Big Data platforms

• Implement programs using Big Data platforms

• Select appropriate Big Data platforms for problem solving

Course content

1. Introduction to Big Data Analytics – Big Data Platforms.

2. Introduction to Python for data analysis. Use of Jupyter Notebooks.

3. Introduction to MapReduce. Algorithm design with MapReduce.

4. Hadoop: Philosophy, architecture and tools, Hadoop cluster. HDFS distributed file system.

5. Hadoop Map Reduce in Practice. Installation and programming with Hadoop Map Reduce.

6. Data storage. Categories of NoSQL systems. The CAP theorem. Installation and use of HBase.

7. Apache Spark. Philosophy, arhitecture, installation, programming & examples.

8. Finding similar elements. Similarity measures. The LSH method.

9. Big Data Algorithms - Clustering: Hierarchical, K-means. Apache Spark MLLib for clustering.

10. Big Data Algorithms - Classification: Naive Bayes, decision trees. Apache Spark MLLib for classification.

11. Big Data Algorithms Association Rules: Frequent itemsets, a-priori algorithm, FP-growth algorithm. Apache Spark MLLib for frequent itemsets.

12. Stream Data Analysis: Sampling, counting distinct elements in a stream, Bloom filters. Apache Spark Streaming for data streams.

13. Graph and Social Graph Analysis: Clustering, Triangle counting. Apache Spark GraphX for data analysis

Assessment

50% Projects (2x25%)

50% Final exam

Course bibliography

(One of the following):

22768468 Εξόρυξη από Μεγάλα Σύνολα Δεδομένων, Τύπος: Σύγγραμμα, Anand Rajaraman, Jeffrey David Ullman, 2014, Εκδόσεις Νέων Τεχνολογιών, ISBN: 978-960-6759-83-3

18549105 Εισαγωγή στην εξόρυξη δεδομένων, Τύπος: Σύγγραμμα, Tan Pang - Ning,Steinbach Michael,Kumar Vipin, 2010, ΤΖΙΟΛΑ, ISBN: 978-960-418-162-9

31391 Εξόρυξη γνώσης από βάσεις δεδομένων και τον παγκόσμιο ιστό, Τύπος: Σύγγραμμα, Βαζιργιάννης Μιχάλης, Χαλκίδη Μαρία, 2005, Τυπωθήτω, ISBN: 978-960-402-116-8

395 DATA MINING, Τύπος: Σύγγραμμα, Margaret H. Dunham, 2004, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ, ISBN: 960-8105-72-2

Additional material

BLOCKCHAIN TECHNOLOGIES AND DECENTRALIZED APPLICATIONS (ΠΛ0844) - AI

Coordinator: Mavridis Ioannis

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Mavridis Ioannis, Fouliras Panayotis*

General competences

After successful conclusion of attendance the student will be able to:

• Understand the technologies and structure of a typical blockchain, as well as its advantages and disadvantages

• Appreciate the role of blockchain in developing cybersecurity and trust management systems

• Tell the differences among the most important blockchain technologies and the types supported by the most prominent providers at present

• Comprehend what an e-contract is and what it constists of, as well as the cases where it can be appied successfully - particularly in information security systems

• Realize the new challenges, as well as opportunites opened in the new environments of technologies, such as the Internet of Things (IoT)

• Develop knowledge and skills for designing and implementing Decentralized Applications (DApps)

Course content

• Introduction to basic concepts and technologies

• How Blockchain works

• Distributed e-legder

• Bitcoin – how it works

• Smart Contracts

• Ethereunm – how it works

• Blockchain categories

• Decentralized - DApps (Decentralized Applications)

• Security and Trust

• Protocols

• Transactions and Scripting

• Mining and Consensus

• Case Studies and Examples

Assessment

Evaluation by individual topic presentation (mandatory towards final assessment participation) and individual assignment

Course bibliography

(One of the following):

Additional material

Recommended Bibliography:

Notes

• “Beginning Blockchain”, B. Singhal, G. Dhameja, P.S. Panda, APress, 2018.

• “Mastering Blockchain: Distributed ledger technology, decentralization, and smart contracts explained”, I. Bashir, Packt Publishing, 2nd Edition, 2018.

• “Solidity Programming Essentials”, R. Modi, Pact Publishing, 2018.

• "Mastering Bitcoin: Programming the Open Blockchain”, A. M. Antonopoulos, O'Reilly Media, 2nd edition (July 1, 2017).

• "Mastering Ethereum: Building Smart Contracts and Dapps", A. M. Antonopoulos, O'Reilly Media, 2019.

Related Scientific Journals:

• International Journal of Blockchains and Cryptocurrencies, InderScience

• JBBA, The Journal of The British Blockchain Association

• Computers and Security (COSE), Elsevier

CLOUD COMPUTING (ΠΛ0831) - AI-TM

Coordinator: Papadimitriou Panagiotis

Semester: 8th (Spring) | **Course type: Elective AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Papadimitriou Panagiotis*

General competences

The course aims to provide a thorough understanding of cloud computing concepts, applications, technologies, and cloud data-center architectures.

Course content

Introduction to Cloud Computing

Cloud Characteristics, Cloud Deployment Models

Roles and Cloud Services (IaaS, PaaS, SaaS)

Server Virtualization, Network Virtualization, Network Interface Virtualization

Datacenters: Scale-out model, Topologies, Architectures

Cloud management: Virtual switching, Virtual machine migration, Fault management

Cloud storage: Key-value stores, Amazon S3

Cloud Pricing Models

Service Level Agreements

Assessment

Written Exam (100%)

Course bibliography

(One of the following):

50658783 Cloud Computing Αρχές, Τεχνολογία και Αρχιτεκτονική 1η Εκδ., Τύπος: Σύγγραμμα, Ricardo Puttini, Thomas Erl, Zaigham Mahmood, 2015, Χ. ΓΚΙΟΥΡΔΑ ΣΙΑ ΕΕ, ISBN: 978-960-512-6865

12250 Cloud computing Μια πρακτική προσέγγιση, Τύπος: Σύγγραμμα, Velte Anthony T.,Velte Toby J.,Elsenpeter Robert P., 2010, Α. Γκιούρδα & ΣΙΑ ΟΕ, ISBN: 978-960-512-597-4

Additional material

Course website (http://compus.uom.gr/INF281/), Slides. ((http://compus.uom.gr/INF281))

COMBINATORIAL OPTIMIZATION (ΠΛ0842) - AI-TM

Coordinator: Sifaleras Angelo

Semester: 8th (Spring) | **Course type: Elective AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Samaras Nikolaos, Sifaleras Angelo*

General competences

Introduction to network optimization models and integer programming, and more specifically in problem modelling and network optimization applications for the design of large-scale networks. The shortest path problem, the minimum spanning tree problem, the maximum flow problem, and the minimum cost network flow problem. Furthermore, the student will be introduced to modelling and solution techniques for integer programming problems, branch & bound algorithm, dynamic programming, and special problems such as the Steiner tree problem and the traveling salesman problem (TSP). The student, apart from the methodology in each section, will learn how to use state-of-the-art optimization software packages such as the CPLEX & Gurobi solvers and the modelling language AMPL.

Course content

Assessment

Written final examination

Course bibliography

(One of the following):

1827 ΔΙΚΤΥΑΚΗ ΒΕΛΤΙΣΤΟΠΟΙΗΣΗ, Τύπος: Σύγγραμμα, ΠΑΠΑΡΡΙΖΟΣ Κ., ΣΑΜΑΡΑΣ Ν., ΣΙΦΑΛΕΡΑΣ Α., 2009, ΖΥΓΟΣ, ISBN: 978-960-8065-68-0

22762766 ΔΙΑΚΡΙΤΗ ΒΕΛΤΙΣΤΟΠΟΙΗΣΗ, Τύπος: Σύγγραμμα, ΜΗΛΙΩΤΗΣ ΠΑΝΑΓΙΩΤΗΣ, ΜΟΥΡΤΟΣ ΙΩΑΝΝΗΣ, 2012, ΟΠΑ, ISBN: 978-960-9443-13-5

11031 Εφαρμοσμένος μαθηματικός προγραμματισμός, Τύπος: Σύγγραμμα, Βασιλείου Παναγιώτης - Χρήστος, 2001, Ζήτη, ISBN: 960-431-716-4

Additional material

Ιστοσελίδα του μαθήματός (διαθέσιμη μετά από εγγραφή στο CoMPUs): http://compus.uom.gr/MT178 (1. Korte B. & Vygen J., Combinatorial Optimization: Theory and Algorithms, 4th ed., Springer-Verlag Berlin Heidelberg, Series: Algorithms and Combinatorics (Vol. 21), 2007. (http://compus.uom.gr/MT178))

COMPUTER NETWORKS DEPLOYMENT AND MANAGEMENT (ΠΛ0610-2) - AI

Coordinator: Fouliras Panayotis

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Fouliras Panayotis*

General competences

In-depth comprehension of basic protocols function at the transport and application layer, as well as programming network applications using the Socket API. Network planning, deployment and monitoring using related software tools.

Course content

Transport layer. Detailed examination of TCP operation and that of its many variations, as well as important protocols at the application layer. How a router works and the basic routing protocols. NAT and Virtual Private Networks (VPN). Examples. Network application programming using the Socket API - examples in various programming languages. Network monitoring and examples using Wireshark. Quality of Service (QoS) - IntServ and DiffServ. Network simulation using popular simulators (e.g., ns-2, OMNeT++). Programming a simple network analyzer (Sniffer). The Simple Network Management Protocol (SNMP).

Assessment

Course bibliography

(One of the following):

1834 ΔΙΚΤΥΑ ΥΠΟΛΟΓΙΣΤΩΝ, Μια Πρακτική Προσέγγιση, Τύπος: Σύγγραμμα, ΦΟΥΛΗΡΑΣ ΠΑΝΑΓΙΩΤΗΣ, 2009, ΖΥΓΟΣ, ISBN: 978-960-8065-66-6

Ελεύθερο Σύγγραμμα

320059 ΑΝΑΠΤΥΞΗ ΚΑΙ ΔΙΑΧΕΙΡΙΣΗ ΔΙΚΤΥΩΝ ΥΠΟΛΟΓΙΣΤΩΝ, Τύπος: Ηλεκτρονικό Βιβλίο, ΦΟΥΛΗΡΑΣ ΠΑΝΑΓΙΩΤΗΣ, 2016, , ISBN: 978-960-603-191-5

Additional material

(Εργαλεία παρακολουθήσεως και προσομοιώσεως Δικτύων Η/Υ, καθώς και επιστημονικά άρθρα, κλπ, διαθέσιμα σε ηλεκτρονική μορφή)

CONSTRAINT LOGIC PROGRAMMING (ΠΛ0828) - AI

Coordinator: Sakellariou Ilias

Semester: **8th** (Spring) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Sakellariou Ilias*

General competences

Logic Programming and Constraint Logic programming are among the most interesting programming schools, that significantly differ from the "classical" schools of imperative and object oriented programming. Upon successful completion of the course the student will be able to: (1) understand the different approach of declarative programming in algorithm implementation, (2) understand the advantages and disadvantages of Logic Programming compared to imperative programming, (3) identify types of applications or modules of larger software systems that could be developed in significantly reduced time using declarative programming, (4) describe and be able to exploit procedures such as term unification and use higher order predicates, (5) design and implement logic programs, exploiting the execution mechanism of the language, unification, and techniques such as recursion and procedural abstraction, (6) explain the nature of a constraint variable, its domain and constraints as relations that express partial information for the problem, (7) describe and explain constraint solving techniques, (8) model problems as constraint satisfaction problems and develop the corresponding implementations in a CLP system.

Course content

Introduction to Logic Programming. Declarative Programming, First Order Predicate Logic and Logic Programs. Prolog Syntax, facts, rules. Program Execution-queries. Logic Variables and Scope. Terms and Unification. Resolution. Execution Mechanism. Debugging. Recursion. Prolog Arithmetic. Lists, cut and control of execution. Higher Order predicates (all solutions, variable call, negation as failure, term composition and decomposition, Prolog DB). Files. Graphs. Natural Language Processing and Grammars. Constraint Satisfaction Problems. The notion of constraints over Variables. Domains. Solving Constraint Satisfaction problems. Filtering algorithms on binary and higher order constraints. The Eclipse programming language. Example problem classes (scheduling, resource allocation).

Assessment

Final written Examination (70%), weekly Coursework (10%), Practicals (20%)

Course bibliography

(One of the following):

41958366 Prolog: Programming in Logic for Artificial Intelligence, Type: textbook, Manolis Marakakis, 2014, New Technology Publications, ISBN: 978-960-6759-98-7

5417 Programming in Logic- PROLOG, Type: textbook, Notopoulos Panagiotis, Anikoula, 2008, ISBN: 9789608729384

Free Access Textbooks

320042 Logic Programming Techniques, Type: e-Book, Sakellariou Ilias, Vassiliadis Nikolaos, Kefalas Petros, Stamatis Dimosthenis, 2016, , ISBN: 978-960-603-246-2

320266 Logic and Functional Programming, Type: e-Book, Panagiotis Stamatopoulos, 2016, , ISBN: 978-960-603-335-3

320266 ΛΟΓΙΚΟΣ ΚΑΙ ΣΥΝΑΡΤΗΣΙΑΚΟΣ ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΣ, Τύπος: Ηλεκτρονικό Βιβλίο, ΠΑΝΑΓΙΩΤΗΣ ΣΤΑΜΑΤΟΠΟΥΛΟΣ, 2016, , ISBN: 978-960-603-335-3

Additional material

Apt, Krzystof R. ;Wallace, Mark G. "Constraint Logic Programming Using ECLiPSe", Cambridge University Press, 2007.

Bratko, Ivan. Prolog Programming for Artificial Intelligence, (3rd edition), Addison Wesley, 2001.

Kowalski, Robert. Logic For Problem Solving, North-Holland, 1983 (from author's web page)

(Apt, Krzystof R. ;Wallace, Mark G. "Constraint Logic Programming Using ECLiPSe", Cambridge University Press, 2007.

Bratko, Ivan. Prolog Programming for Artificial Intelligence, (3rd edition), Addison Wesley, 2001.

Kowalski, Robert. Logic For Problem Solving, North-Holland, 1983 (from author's web page)

(http://compus.uom.gr/INF256/index.php))

COSTING (ΠΛ0824) - AI

Coordinator: Vazakidis Athanasios

Semester: **8th** (Spring) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Vazakidis Athanasios, Stavropoulos Antonios*

General competences

This course is aiming to:

1. Enable students familiar with the essentials of the cost and the cost accounting.

2. Enable students capable for understanding the content and the way by which the 9th class of the Greek general chart of accounts is used in practice.

3. Enable students capable of posting entries in accounting books of a company which is classified in the third class (C' class) of book keeping in accordance with the 9th class of the Greek general chart of accounts.

4. Enable students capable for implementing cost accounting software using computers.

Course content

Distinction among financial, managerial and cost accounting. Budgeting control, budgeting. Essentials of cost accounting. Costing process of products, goods and services, Analysis the way by which the 9th class of the Greek general chart of accounts is used in practice. Recording of sheets for cost sharing. Examples of costing concerning: finished, unfinished, residuals and defective products. Valuation of products, recording of sheets for products held by third parties out of the company. Flow of materials using measures related to their quantity and value until the completion of finished products. Cost of production based on budgeting (budgeting cost of production). Monthly and annual costing process based on examples. It's worth to be noted that, the majority of the exercises and cases are solved at the laboratories of our department using specific cost accounting software.

Assessment

Course bibliography

(One of the following):

7939 ΚΟΣΤΟΛΟΓΗΣΗ ΜΕ ΤΗΝ ΟΜΑΔΑ 9 ΤΟΥ Γ.Λ.Σ. - ΜΗΝΙΑΙΑ ΚΟΣΤΟΛΟΓΗΣΗ - ΕΤΗΣΙΑ ΚΟΣΤΟΛΟΓΗΣΗ - ΔΙΑΚΙΝΗΣΗ ΑΠΟΘΗΚΗΣ ΣΤΗΝ ΠΡΑΞΗ, Τύπος: Σύγγραμμα, ΔΗΜΗΤΡΙΟΣ ΚΑΡΑΓΙΑΝΝΗΣ, ΙΩΑΝΝΗΣ ΚΑΡΑΓΙΑΝΝΗΣ, ΑΙΚΑΤΕΡΙΝΗ - ΕΙΡΗΝΗ ΚΑΡΑΓΙΑΝΝΗ, 2009, ΚΑΡΑΓΙΑΝΝΗ & ΣΙΑ ΟΕ, ISBN: 978-960-98515-2-7

13656 ΔΙΟΙΚΗΤΙΚΗ ΛΟΓΙΣΤΙΚΗ, Τύπος: Σύγγραμμα, RAY H. GARRISON, ERIC W. NOREEN, 2006, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-930-5

Additional material

ELECTRONIC COMMERCE (ΠΛ0807) - AI-TM

Coordinator: Fouskas Konstantinos

Semester: 8th (Spring) | **Course type: Elective AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Fouskas Konstantinos, Mastoras Theodoros*

General competences

This course introduces students to:

a) the strategy, application and implementation of Electronic Commerce (EC) /E-Business (EB)and mobile commerce/business- Technology, business, and market aspects

b) practical approaches to implementing an EC/ EB and mobile commerce/business strategy. Case studies - best practices - business / industry applications.

Course content

E-Commerce /E-Business Strategy and applications. Business process integration and E-Business plan. Definition approaches and introduction to: Electronic Commerce (EC) /E-Business (EB) and mobile commerce/business, e-services, Internet, World Wide Web. The E-commerce environment. The impact on information systems within a business, impact on business development and strategy on the industries and markets.BPR and E-Business plan and strategy.E- M- Business Models (Business innovation), e-shops, e-auctions, e-marketplaces, portals, dynamic pricing models, affiliate marketing, viral marketing models, e.t.c... E- M- Business Applications: e/m-Health, learning, banking, tourism, etc business/ industry sectors.The extended enterprise, synergies, networks' development and management, e-supply chain management, Virtual organizations/enterprises, social networks.E/M-Business plan strategy and development, The strategy of Web site- shop - portal (e- business model) development, evaluation and management. Case Studies.

Assessment

Course bibliography

(One of the following):

50656360 ΨΗΦΙΑΚΕΣ ΕΠΙΧΕΙΡΗΣΕΙΣ ΚΑΙ ΗΛΕΚΤΡΟΝΙΚΟ ΕΜΠΟΡΙΟ: ΣΤΡΑΤΗΓΙΚΗ, ΥΛΟΠΟΙΗΣΗ ΚΑΙ ΕΦΑΡΜΟΓΗ, Τύπος: Σύγγραμμα, DAVE CHAFFEY, 2016, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-671-8

86053196 Ψηφιακό Μάρκετινγκ, Τύπος: Σύγγραμμα, Βλαχοπούλου Μάρω, Έκδοση: 1/2019, ISBN: 979-888-8888-888

12536563 Ηλεκτρονικό εμπόριο 2010, Τύπος: Σύγγραμμα, Turban Efraim,King David,,Lee Jae,Ting-Peng Liang, Turban Deborah, 2011, Α. Γκιούρδα & ΣΙΑ ΟΕ, ISBN: 978-960-512-605-6

18548694 e - Οικονομία-Εμπόριο-Μάρκετιγκ-Διακυβέρνηση, Τύπος: Σύγγραμμα, Γεωργιάδου Ε., Τριανταφύλλο Ευ., Οικονομίδης Αν., 2010, ΤΖΙΟΛΑ, ISBN: 978-960-418-242-8

Additional material

ENTREPRENEURSHIP CASE STUDIES (ΠΛ0839) - TM

Coordinator: Fouskas Konstantinos

Semester: 8th (Spring) | **Course type: Elective TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Fouskas Konstantinos*

General competences

The Entrepreneurship and Start-ups course introduces students to the concept of entrepreneurship through the presentation of actual case studies from the international business environment. Emphasis will be given to innovative entrepreneurship cases (such as social networks and electronic business) and new forms of entrepreneurial focus such as corporate social responsibility. The aim of this course is the encouragement and development of young entrepreneurship.Moreover the students come closer to the development of their own entrepreneurial idea and participate in national entrepreneurship competitions.

Course content

Initially, the issue of entrepreneurship and its dimensions in national and international level will be presented. Following, before each lecture a Case Study will be given to students, will be discussed in class and in collaboration with the instructor useful conclusions in entrepreneurship are drawn. Issues to be discussed include green and social entrepreneurship, innovative and digital entrepreneurship, clusters of enterprises, global entrepreneurship.

Assessment

Compalosry assigments 100%

Course bibliography

(One of the following):

77107408 Επιχειρηματικότητα-Από τη Θεωρία στην Πράξη Kuratko F. Donald, Επιμέλεια Έκδοσης Φαφαλιού Ειρήνη,Έκδοση: 1/2018, ISBN: 9789925563050

68369937 Επιχειρηματικότητα και Κοινωνική Οικονομία, Τύπος: Σύγγραμμα, Σαρρή Κατερίνα, Τριχοπούλου Άννα, 2017, Τζιόλα, ISBN: 978-960-418-681-5

Additional material

(Σημειώσεις και διαφάνειες μαθήματος. (http://compus.uom.gr/MT187))

HIGH PERFORMANCE COMPUTING (ΠΛ0705-1) - AI

Coordinator: Margaritis Konstantinos

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Margaritis Konstantinos*

General competences

• Explain the features of each classification in Flynn's taxonomy, (MIMD, SIMD) as well as terms such as shared / distributed memory, SMP, multi-core, UMA / NUMA, MPP .

• Computer systems performance metrics and their calculation.

• Describe ILP and memory hierarchy and their limitations

• Describe assembly-level support for atomic operations.

• Describe the challenges and solutions in maintaining cache coherence in different systems.

• Describe the basic interconnection structures used in several parallel archietctures.

• Describe the key performance challenges in different parallel systems.

• Describe the advantages and limitations of GPUs vs. CPUs and alternative models of CPU-GPU integration.

• Apply several parallel algorithmic and programming patterns and explain the field of application of each pattern.

• Calculate the implications of Amdahl's and Gustafson's law for a particular parallel algorithm and empirically measure the actual performance and scaling.

• Explain performance impacts of data locality.

• Detect and correct a load imbalance.

• Describe how data distribution/layout can affect an algorithm's communication costs.

• Detect and correct an instance of false sharing.

• Apply Foster's methodology for parallel application development.

• Implement basic parallel algorithms and aplplications (such as matrix, sorting, matching, graph etc computations) using shared memory, distributed memory, SIMD and GPU-based programming environments

Course content

• High Performance Computing Architecture and Software Support

• Performance Evaluation and Analysis of Computer Systems and Applications

• Parallel Algorithms: Design, Implementation and Analysis

• Parallel Algorithmic and Programming Patterns

• Shared Memory Parallel Programming

• Distributed Memory Parallel Programming

• SIMD and GPU Accelerator Programming

Assessment

• Laboratoty Exercises

• Written Examination

Course bibliography

(One of the following):

12279261 ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΣ ΜΑΖΙΚΑ ΠΑΡΑΛΛΗΛΩΝ ΕΠΕΞΕΡΓΑΣΤΩΝ, Τύπος: Σύγγραμμα, DAVID B. KIRK, WEN-MEI W. HWU, 2010, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-423-3

18548957 MPI, Τύπος: Σύγγραμμα, Μάργαρης Αθ., 2008, ΤΖΙΟΛΑ, ISBN: 978-960-418-145-2

33134125 Εισαγωγή στον Παράλληλο Υπολογισμό, Τύπος: Σύγγραμμα, Γραμματή Πάντζιου, Βασίλειος Μάμαλης, Αλέξανδρος Τομαράς, 2013, Εκδόσεις Νέων Τεχνολογιών, ISBN: 978-960-6759-89-5

50656351 ΕΙΣΑΓΩΓΗ ΣΤΟΝ ΠΑΡΑΛΛΗΛΟ ΠΡΟΓΡΑΜΜΑΤΙΣΜΟ, Τύπος: Σύγγραμμα, PETER S. PACHECO, 2015, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-666-4

Additional material

• Course website (http://compus.uom.gr/INF120/) -105-

• Τεχνικές Παράλληλου Προγραμματισμού, B.P.Lester (μτφ Κ.Γ. Μαργαρίτης), Πανεπιστημιακές Σημειώσεις (Ιστοτόπος μαθήματος.Τεχνικές Παράλληλου Προγραμματισμού, B.P.Lester (μτφ Κ.Γ. Μαργαρίτης), Πανεπιστημιακές Σημειώσεις (http://compus.uom.gr/INF120/))

LOGISTICS INFORMATION SYSTEMS (ΠΛ0819) - AI

Coordinator: Madas Michael

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Madas Michael*

General competences

The course aims to present topics related to the planning, operation and decision support in logistics and supply chain management. Special emphasis is placed on the use of quantitative methods for the modelling and solution of relevant logistical and supply chain problems, as well as the application of emerging technologies and information systems in logistics and supply chain management.

Course content

The course covers the following thematic sections: i) introduction, structure and basic concepts of Supply Chain Management (SCM), ii) main and supporting logistical functions, iii) warehousing, iv) facility location, v) supply chain modelling, vi) information systems in logistics and SCM and vii) advanced topics and emerging trends in SCM. The course includes laboratory sessions on the use of software for the optimization of SCM decisions and operations.

Assessment

Final exam: 70%

Team/group assignment (and presentation): 30%

Course bibliography

(One of the following):

1. Chopra, S. and P. Meindl (Επιμέλεια Λ. Τσιρώνης), (2014), Διοίκηση Εφοδιαστικής Αλυσίδας: Στρατηγική, Προγραμματισμός και Λειτουργία, Εκδόσεις Τζιόλα. (Κωδικός Βιβλίου στον Εύδοξο: 41955004)

2. Bowersox, D., D. Closs, M. Bixby Cooper, and J. Bowersox (Επιμέλεια Α. Νεάρχου, Φ. Βούζας, Π. Ρεπούσης), (2015), Logistics: Εφοδιαστική & Διοίκηση Δικτύων Διανομής, Broken Hill Publishers Ltd. (Κωδικός Βιβλίου στον Εύδοξο: 50659353)

Additional material

Lecture slides/material (Compus)

Relevant Scientific Journals:

- Journal of Supply Chain Management
- Supply Chain Management: An International Journal
- Journal of Business Logistics
- International Journal of Logistics Management
- International Journal of Logistics: Research and Applications
- International Journal of Physical Distribution and Logistics Management
- EURO Journal on Transportation and Logistics
- Transportation Science
- Transportation Research Parts A, B, C, D & E
- Transportation Research Record
- Transport Policy
- Journal of Global Operations and Strategic Sourcing
- Production and Operations Management
- Interfaces
- Decision Support Systems
- Expert Systems with Applications
- Management Science
- Operations Research
- European Journal of Operational Research

MOBILE AND WIRELESS COMMUNICATIONS SYSTEMS (ΠΛ0841) - AI

Coordinator: Psannis Konstantinos

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Psannis Konstantinos*

General competences

Course content

Mobile and personal communications, Wireless mobile and personal communication systems, Design issues, Impact of mobility on communication networks, 3G and 4G mobile communication systems. The wireless environment in mobile communications, Radio Propagation and Propagation Path-Loss Models An Overview of Digital Communication and Transmission, Fundamentals of Cellular Communications, Multiple Access Techniques, Modulation Schemes, Antennas, Diversity, and Link Analysis, Spread Spectrum (SS) and CDMA Systems, Tele-traffic Engineering, Mobility management, Location management, Location update, Methods for mobile terminal positioning. Algorithms for mobile and wireless Communications Systems and their Applications, Security management, managerial and regulatory issues.

Assessment

Written final examination / Assignment/lab tests

Course bibliography

(One of the following):

18548787 Δίκτυα κινητών και προσωπικών επικοινωνιών, Τύπος: Σύγγραμμα, Θεολόγου Μ., 2010, ΤΖΙΟΛΑ, ISBN: 978-960-418-278-7

Additional material

ebooks, papers, Demonstrations, Virtual Labs , Experiments (http://compus.uom.gr)

MONEY AND CAPITAL MARKETS (ΠΛ0608) - AI-TM

Coordinator: Dasilas Apostolos

Semester: 8th (Spring) | **Course type: Elective AI-TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Dasilas Apostolos*

General competences

The learning objectives of the module "Money and Capital Markets are:

1. The presentation and analysis of Money & Capital Markets as well as the construction and management of investment portfolios in these markets.

2. The investigation of the institutional characteristics of the Money & Capital Markets, the theoretical basis of their operation, their financial products/services, the methods of price/return estimation of these products and the hedging of financial risk.

3. The use of spreadsheet type software for the construction and management of Money & Capital products, the statistical analysis of these products, the construction and management of investment portfolios and the use of optimization models (risk-return).

Course content

1. Introduction to money and capital markets
2. Financial institutions
3. Modern financial products
4. Hellenic capital market and supervision
5. Valuing stocks
6. Risk-return estimation
7. Portfolio theory
8. Portfolio construction
9. Portfolio optimization
10. Portfolio evaluation

Assessment

Written final examination: 100%

Course bibliography

(One of the following):

50657709 Σύγχρονη Θεωρία Χαρτοφυλακίου και Ανάλυση Επενδύσεων, Τύπος: Σύγγραμμα, Edwin J. Elton, Martin J. Gruber, Stephen J. Brown, William N. Goetzmann, 2016, Εκδόσεις Utopia, ISBN: 978-618-81298-9-4

86053480 Αγορές Χρήματος και Κεφαλαίου, Τύπος: Σύγγραμμα, Νούλας, Αθανάσιος, 2019, Εκδόσεις Τζιόλα, ISBN: 978-960-418-491-0

77119007 Αγορά Χρήματος - Κεφαλαίου και Διαχείριση Χαρτοφυλακίου Χρεογράφων, Τύπος: Σύγγραμμα, Κιόχος Πέτρος, Σωτηρόπουλος Ιωάννης, Παπανικολάου Γεώργιος, 2018, Εκδόσεις Ελενη Κιόχου, ISBN: 978-618-81412-3-

Additional material

http://compus.uom.gr/INF158

NETWORK-CENTRIC SOFTWARE (ΠΛ0835) - TM

Coordinator: Xinogalos Stylianos

Semester: 8th (Spring) | **Course type: Elective TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Xinogalos Stylianos*

General competences

After successfuly attending the course students will be able to: handle web server software and configure their system for developing Java EE application (Eclipse, Apache server); distinguish, describe and use the main structures of JAva servlets and JSP; use data base management systems (MySQL) for designing and network databases to Java web applications; implement dynamic web pages and applications using servlets and JSP focusing on server-side scripting.

Course content

Development of applications sing the object-oriented design technique and the network centric programming language.

Comparative presentation of the main features and the role of the various types of Java programs: applications, applets, web aaplications using servlets and JSP. Emphasis is given on implementing web applications and sites using servlets and JSP.

Development of applications using servlets and JSP: the role of servlets and JSP, installing and configuring Apache Tomacat server, life cycle of a servlet, HTTP requests and responses, cookies, session tracking, JDBC, Java beans, forms, Model View Controller architecture.

Review of relevant frameworks: Apache Struts, Spring MVC, JavaServer Faces.

Assessment

Programming assignments

Exams (lab)

Course bibliography

(One of the following):

13578 SERVLETS ΚΑΙ ΣΕΛΙΔΕΣ ΔΙΑΚΟΜΙΣΤΗ JAVA: ΤΕΧΝΟΛΟΓΙΕΣ ΠΥΡΗΝΑ, Τύπος: Σύγγραμμα, MARTY HALL, LARRY BROWN, 2007, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-001-3

50656340 ΕΙΣΑΓΩΓΗ ΣΤΗΝ JAVA, Τύπος: Σύγγραμμα, ΓΙΩΡΓΟΣ ΛΙΑΚΕΑΣ, 2015, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-659-6

Additional material

Notes, assignments, programs

Course website (http://compus.uom.gr/MT188/) (Διδακτικές σημειώσεις, φυλλάδια ασκήσεων, προγράμματα (διατίθενται μέσω του CoMPUs))

NEURAL NETWORKS (ΠΛ0806) - AI

Coordinator: Refanidis Ioannis

Semester: **8th** (Spring) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Refanidis Ioannis*

General competences

By the end of the course the student should be able (a) to recognize machine learning problems, (b) to create and train neural networks of various architectures, (c) to become familiar with various neural networks tools, (d) to prepare data for feeding neural networks, (e) to avoid over fitting to the training data, (f) to comparatively evaluate various learning models.

Course content

Machine leraning. Non-symbolic learning. Artificial neural model.

Supervised learning. Perceptron. The Delta rule. Feed-forward networks. Multi-layer networks and error backpropagation.

Recurrent networks.Non-supervised learning. Clustering. Kohonen rule.

Dynamic networks. Time series. Hopfield networks.

Radial networks. Probabilistic networks.

Control systems. Delay elements and linear neurons. Linear filters.Genetic algorithms.

Alternative learning models. Decision trees. Categorization rules. Association rules. Support vector machines.

Assessment

Final examination 100%.

Optional homework up to an additional 30%

Course bibliography

(One of the following):

Neural Networks and Learning Machines (3rd Edition), by Simon O. Haykin, 2008, Pearson.

Additional material

Lecture slides. Exemplary solved exercises. (http://compus.uom.gr/INF201/index.php)

PRODUCTION AND OPERATIONS MANAGEMENT (ΠΛ0416) - AI

Coordinator: Stiakakis Emmanuil

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Stiakakis Emmanuil*

General competences

To make students familiar with the management principles and activities in the production process, as well as the understanding of the role and the importance of production in the manufacturing and service sectors.

Course content

The function of production – Relationship to the other business functions – Differences between manufacturing firms and firms providing services,

The use of information technologies in the production process – Computer Aided Design and Computer Aided Manufacturing – Flexible Manufacturing Systems – Computer Integrated Manufacturing – Robotics,

Demand and Capacity – Demand forecasting – Evaluation of forecasts – Facing the variations of demand,

Plant layout – Material handling methods – Minimizing the material handling cost – Computer aided layout design,

Production planning and control – Determining the size of production lots – Work allocation to productive means – Manufacturing execution planning,

Material Requirements Planning – Manufacturing Resources Planning – Just in Time – Kanban – Optimized Production Technology.

Assessment

Course bibliography

(One of the following):

59382666 Διοίκηση Παραγωγής και Υπηρεσιών, Τύπος: Σύγγραμμα, Στειακάκης Εμμανουήλ- Κωφίδης Νίκος, 2016, ΤΖΙΟΛΑ, ISBN: 978-960-418-608-2

11513 Διοίκηση παραγωγικών συστημάτων, Τύπος: Σύγγραμμα, Δημητριάδης Σωτήριος Γ.,Μιχιώτης Αθανάσιος Ν., 2007, Κριτική, ISBN: 978-960-218-522-3

68402905 Διοίκηση Παραγωγής Ο Σχεδιασμός Παραγωγικών Συστημάτων - Β΄ Έκδοση, Τύπος: Σύγγραμμα, Παππής Κώστας Π., 2017, UNIBOOKS ΙΚΕ, ISBN: 9786185304218

Additional material

(Διοίκηση Συστημάτων Παραγωγής

Λ. Λιαρμακόπουλος

Αγραφιώτου Χρυσούλα, Αθήνα, 2010, ISBN: 960-91327-0-7

Διοίκηση Παραγωγής, Βασικές αρχές του προγραμματισμού και της ρύθμισης παραγωγής

S. Kiener, N. Maier-Scheubeck, R. Obermaier, M. Weib

Προπομπός, Αθήνα,)

PROFESSIONAL SKILLS IN ENGLISH (The course is taught in English) (ΠΛ0834) - AI-TM

Coordinator: Kantaridou Zoe

Semester: **8th** (Spring) | **Course type:** **Elective AI-TM** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Kantaridou Zoe*

General competences

The course familiarizes students with topics and conventions of speaking and writing in English in the international business environment. Students prepare their curriculum vitae (CV) and cover letters for selected real job advertisements and present the profile of an actual Greek or international company in the field of informatics. Professional skills such as telephoning, letter writing, emails, turn-taking in negotiations and intercultural awareness skills are practiced.

Course content

1. Company profile & structure
2. Advertising & marketing
3. e-Commerce
4. Applying for a job
5. Telecommuting
6. Business across cultures
7. Business etiquette
8. Company accountability
9. SWOT analysis
10. Startup companies

Assessment

Students prepare their portfolio of assignments (100%)

Course bibliography

(One of the following):

• Kantaridou, Zoe; Papadopoulou, Iris; Stefanou, Polixeni. Business English at University. Εκδ. Ανικούλα, 2019.

• Papadopoulou Iris. Research Reading and Writing Skills. Advanced English for Academic Purposes. Course for Students of Economic and Social Sciences. Εκδ. Πανεπιστημίου Μακεδονίας, 2014.

Additional material

PROGRAMMING LANGUAGES AND COMPILERS (ΠΛ0827-1) - AI

Coordinator: Sakellariou Ilias

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Sakellariou Ilias*

General competences

Upon the successful completion of the course the student will be able to (1) demonstrate knowledge of the main concepts of compiling higher level languages and the theoretical foundations of Programming Language Compilers, (2) describe the basic compiling phases (lexical, syntax, semantic analysis and code generation) and identify in which phase a check takes place, (3) select appropriate algorithms (e.g. parsing) for a language compiler implementation, (4) design lexical (e.g. regular expressions) and syntax analysis and propose a correct suitable grammar for a language, (5) describe the importance of type checking and the rest of the semantic checks that take place during semantic analysis and design the implementation of suck checks using attributed grammars, (6) demonstrate knowledge of code generation techniques (7) be able to develop a a small-size compiler using well-established tools.

Course content

Introduction to Compilers and Compiler Design. Lexical Analysis (Finite Automata, Regular Expressions, Lexical Analyser using FLEX),Syntax Analysis (Grammars, bottom-up and top-down syntax analysis, LL and LR Syntax Analysers, Syntax Analysis using Bison, Symbol Table Management, Information stored in Symbol Table, Data structures),Semantic Analysis (Checks performed during semantic analysis, Type checking, Syntax Directed Analysis),Intermediate Code Generation (Syntax Directed Translation, Intermediate Languages), Final Code Generation (Issues and Techniques, Memory Management).

Assessment

Final written Examination (100%), Optional Practicals (20%) concerning the implementation of a simple compiler using well established tools.

Course bibliography

(One of the following):

12713790 Compilers, type: Textbook, Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, 2011, New Technology Editions, ISBN: 978-960-6759-72-7

13858 Programming Language Pragmatics, type: Textbook, MICHAEL L. SCOTT, 2009, Kleitharithmos, ISBN: 978-960-461-230-7

68383471 Programming Language Compilers: Theory & Practice, type: Textbook, Konstantinos Lazos, Panagiotis Katsaros, Zafiris Karaiskos, 2004, Self-publication, ISBN: 960-87723-4-6

77108866 Engineering a Compiler, type: Textbook, Keith D. Cooper, Linda Torczon, 2018, Crete University Press, ISBN: 978-960-524-519-1

Additional material

Flex Manual, Fast Lexical Analyser (http://flex.sourceforge.net/)

Bison Manual, GNU Parser Generator http://www.gnu.org/software/bison/

Course Web page: http://compus.uom.gr/INF139/index.php (Flex Manual, Fast Lexical Analyser (http://flex.sourceforge.net/)

Bison Manual, GNU Parser Generator http://www.gnu.org/software/bison/ (http://compus.uom.gr/INF139/index.php))

SOFTWARE QUALITY ASSURANCE (CSC501) - AI

Coordinator: Ampatzoglou Apostolos

Semester: **8th** (Spring) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Ampatzoglou Apostolos*

General competences

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

- describe the basic notions of software quality
- describe the basic notions of software quality models
- apply software quality assessement approaches
- apply methods and tool for enhancing software quality
- describe advanced topics of software quality assurance (e.g., technical debt) and apply them in pracrtice

Course content

- Introduction to software quality
- Software quality models and attributes
- Assessment of software quality at the source code level
- Assessment of software quality at the process level
- Assessment of software quality at the design level
- Assessment of software quality at the requirements level
- Design Patterns
- Software refactorings
- Introduction to technical debt
- Technical debt management
- Software testing
- Software quality international standards

Assessment

The assessment will be perfromed based on:

- Written exams (60%)
- Team assignments (40%)

Methods for written exams:

- Problem solving

The criteria for the assessment are posted in the course website

Course bibliography

(One of the following):

13600 ΑΝΤΙΚΕΙΜΕΝΟΣΤΡΕΦΗΣ ΣΧΕΔΙΑΣΗ: UML, ΑΡΧΕΣ, ΠΡΟΤΥΠΑ ΚΑΙ ΕΥΡΕΤΙΚΟΙ ΚΑΝΟΝΕΣ, Τύπος: Σύγγραμμα, ΑΛΕΞΑΝΔΡΟΣ Ν. ΧΑΤΖΗΓΕΩΡΓΙΟΥ, 2005, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-882-1

13597 ΑΝΤΙΚΕΙΜΕΝΟΣΤΡΕΦΗΣ ΑΝΑΠΤΥΞΗ ΛΟΓΙΣΜΙΚΟΥ ΜΕ ΤΗ UML, Τύπος: Σύγγραμμα, ΒΑΣΙΛΗΣ ΓΕΡΟΓΙΑΝΝΗΣ, ΓΙΩΡΓΟΣ ΚΑΚΑΡΟΝΤΖΑΣ, ΑΧΙΛΛΕΑΣ ΚΑΜΕΑΣ, ΓΙΑΝΝΗΣ ΣΤΑΜΕΛΟΣ, ΠΑΝΟΣ ΦΙΤΣΙΛΗΣ, 2006, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 960-209-913-5

Additional material

Related scientific journals:

- https://www.sciencedirect.com/journal/information-and-software-technology
- https://www.sciencedirect.com/journal/journal-of-systems-and-software
- https://link.springer.com/journal/11219

SPECIAL TOPICS IN ECONOMETRICS (ΠΛ0815) - AI

Coordinator: Dritsakis Nikolaos

Semester: **8th** (Spring) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Dritsakis Nikolaos*

General competences

The basic aim of this unit is to study the definition of time series stationarity and cointegration as well as to determine the relationship of causality using data from the field of economics and management.

Course content

StationarityIntroductionBasic Meanings (Time series data, Stochastic Procedure, White noise, Random walk, Stochastic and Deterministic trend, Integrated time series)Spurious regressionsTime series stationarityStationarity tests (Graphs)Autocorrelation coefficientsUnit RootsUnit Root TestsDickey - Fuller (DF) testAugmented Dickey - Fuller (ADF) testsSelection of number time lagsPhillips-Perron testsCointegrationDefinitionsCointegration testsEngel - Granger testsJohansen testsError Correction ModelsEstimation of error correction modelCausalityDefinitionGranger causality test

Assessment

Course bibliography

(One of the following):

28308114 ΣΥΓΧΡΟΝΕΣ ΜΕΘΟΔΟΙ ΑΝΑΛΥΣΗΣ ΧΡΟΝΟΛΟΓΙΚΩΝ ΣΕΙΡΩΝ, Τύπος: Σύγγραμμα, ΔΗΜΕΛΗ ΣΟΦΙΑ, 2013, ΕΤΑΙΡΕΙΑ ΑΞΙΟΠΟΙΗΣΗΣ ΚΑΙ ΔΙΑΧΕΙΡΙΣΗΣ ΤΗΣ ΠΕΡΙΟΥΣΙΑΣ ΤΟΥ ΟΙΚΟΝΟΜΙΚΟΥ ΠΑΝΕΠΙΣΤΗΜΙΟΥ ΑΘΗΝΩΝ, ISBN: 978-960-9443-17-3

43350 ΟΙΚΟΝΟΜΕΤΡΙΚΑ ΥΠΟΔΕΙΓΜΑΤΑ ΚΑΙ ΕΦΑΡΜΟΓΕΣ ΜΕ ΤΟ EVIEWS, Τύπος: Σύγγραμμα, ΣΥΡΙΟΠΟΥΛΟΣ ΚΩΣΤΑΣ, Διονύσης Θ. Φίλιππας, 2010, ΑΝΙΚΟΥΛΑ, ISBN: 9789605160463

Additional material

TAXATION FOR INDIVIDUALS AND BUSINESS ENTITIES (ΠΛ0620) - AI

Coordinator: Vazakidis Athanasios

Semester: **8th** (Spring) | **Course type:** **Elective AI** | **Weekly hours:** **3** | **ECTS:** **5**

Instructors: *Vazakidis Athanasios, Stavropoulos Antonios*

General competences

This course is aiming to:

i. Enable students familiar with the fundamentals of taxation for individuals and business entity in Greece.

ii. Help students to acquire the necessary experience for filling without errors the annual tax statements of individuals.

iii. Enable students filling without errors the annual tax statements of business entities.

iv. Enable students to respond in real situation relative to tax topics by solving exercises and case studies.

Course content

The course approaches the taxation of revenues produced by all recognized recourses accordingly the Greek tax legislation. It is noted that tax legislation in Greece recognize seven possible sources of income. Particularly its content focused on the tax treatment of revenues produced by agricultural companies, professionals, earned income, technical companies and capital companies such as SA companies, Ltd Companies and cooperatives. Also the way by which taxation imposed to foreign companies operating in Greece is presented. The accurate fill of tax statements forms of individuals E1, E2, E3, E9 is also a learning . The lectures of this course combine theoretical examples and case studies which are solving using hand written and the use of software.

Assessment

Course bibliography

(One of the following):

59385627 ΦΟΡΟΛΟΓΙΚΑ-ΦΟΡΟΤΕΧΝΙΚΑ-ΥΠΟΛΟΓΙΣΜΟΣ ΤΟΥ ΦΟΡΟΥ ΕΙΣΟΔΗΜΑΤΟΣ-ΦΟΡΟΛΟΓΙΚΕΣ ΔΗΛΩΣΕΙΣ-ΠΑΡΑΔΕΙΓΜΑΤΑ & ΕΦΑΡΜΟΓΕΣ ΣΤΗΝ ΠΡΑΞΗ, Τύπος: Σύγγραμμα, ΙΩΑΝΝΗΣ Δ. ΚΑΡΑΓΙΑΝΝΗΣ, ΑΙΚΑΤΕΡΙΝΗ Δ. ΚΑΡΑΓΙΑΝΝΗ, ΔΗΜΗΤΡΙΟΣ Ι. ΚΑΡΑΓΙΑΝΝΗΣ, 2015, ΙΩΑΝΝΝΗΣ ΚΑΡΑΓΙΑΝΝΗΣ ΚΑΙ ΑΙΚΑΤΕΡΙΝΗ ΚΑΡΑΓΙΑΝΝΗ Ο.Ε., ISBN: 978-960-9781-13-8

68377911 Φορολογική Λογιστική τόμος Β 2η έκδοση, Τύπος: Σύγγραμμα, Τόμος: 2, Γκίνογλου Δημήτριος, 2017, BROKEN HILL PUBLISHERS LTD, ISBN: 9789963274826

Additional material

TECHNOLOGICAL INNOVATION MANAGEMENT (ΠΛ0837) - TM

Coordinator: Kitsios Fotios

Semester: 8th (Spring) | **Course type: Elective TM** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Kitsios Fotios*

General competences

The module aims to introduce students to Change Theory. The rapidly changing business environment of last years has created uncertainty in the market place and a high risk for future decisions in the next years. In order to survive in this demanding market place, organisations have only one choice, to successfully face technological changes. Techniques of planning and application of changes are analyzed.

Course content

Impact analysis of technology in structure, organization and production of business or organisation. Analytical approach of the impact at the domains of marketing, human resource, products development and production, organizational structure, finance management, technological infrastructure. Synthesized presentation of managerial implementation plan for the resulting changes. Cases analysis.

Assessment

Course bibliography

(One of the following):

77121044 ΕΠΙΚΑΙΡΑ ΘΕΜΑΤΑ ΣΤΡΑΤΗΓΙΚΗΣ ΤΩΝ ΕΠΙΧΕΙΡΗΣΕΩΝ, Τύπος: Σύγγραμμα, ΠΑΠΑΔΑΚΗΣ ΒΑΣΙΛΕΙΟΣ, 2018, ΕΥΓΕΝΙΑ ΜΠΕΝΟΥ, ISBN: 978-960-359-138-2

50659772 Οργανωσιακή Αλλαγή, Τύπος: Σύγγραμμα, Senior B., Dr Swailes S., 2016, BROKEN HILL PUBLISHERS LTD, ISBN: 9789963258512

32998194 Καινοτομία και αλλαγή στο επιχειρείν, Τύπος: Σύγγραμμα, Ελένη Ε. Σαλαβού, 2013, Εκδοτικός Οίκος Rosili, ISBN: 978-960-7745-31-6

77109690 Οργανωσιακή συμπεριφορά, Τύπος: Σύγγραμμα, Robbins Stephen P., Judge Timothy A., 2018, Κριτική, ISBN: 978-960-586-233-6

13764 Η ΗΓΕΣΙΑ ΣΤΟΥΣ ΟΡΓΑΝΙΣΜΟΥΣ, Τύπος: Σύγγραμμα, GARY YUKL, 2009, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-263-5

8591 ΔΙΟΙΚΩΝΤΑΣ ΤΙΣ ΑΛΛΑΓΕΣ, Τύπος: Σύγγραμμα, Μαρία Βακόλα, 2009, ΑΝΔΡΕΑΣ ΣΙΔΕΡΗΣ - ΙΩΑΝΝΗΣ ΣΙΔΕΡΗΣ & ΣΙΑ Ο.Ε., ISBN: 960-08-0348-X

68393817 ΟΡΓΑΝΩΣΙΑΚΗ ΣΥΜΠΕΡΙΦΟΡΑ, Τύπος: Σύγγραμμα, ΧΥΤΗΡΗΣ ΛΕΩΝΙΔΑΣ, 2017, ΕΥΓΕΝΙΑ ΜΠΕΝΟΥ, ISBN: 978-960-359-129-0

Additional material

VIRTUAL ENTERPRISES AND NEW TECHNOLOGIES (ΠΛ0724) - AI

Coordinator: Georgiadis Christos

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Stiakakis Emmanuil*

General competences

(a) To familiarize students with the concept of virtual enterprises and business activity in the digital economy, (b) to acquire knowledge with regard to the use and exploitation of new technologies by virtual enterprises.

Course content

Introduction to the concept of virtual enterprise (analysis of the term «virtual enterprise», introduction to the relationship between virtual enterprises and Information & Communications Technologies)Knowledge management and virtual communities (types of virtual communities, economy and virtual communities, social Web, development stages of virtual communities) Entrepreneurship and virtual enterprise (analysis of the term «entrepreneurship» - ways to develop entrepreneurship, sources of financial support for entrepreneurship) E-Auctions (types of e-auctions, new technologies and e-auctions, advantages and disadvantages of online auctions)Case studies of virtual enterprises (successful cases of virtual enterprises, reasons to develop entrepreneurship).

Assessment

Course bibliography

(One of the following):

14035 ΚΑΙΝΟΤΟΜΙΑ, ΣΤΡΑΤΗΓΙΚΗ, ΑΝΑΠΤΥΞΗ ΚΑ ΠΛΗΡΟΦΟΡΙΑΚΑ ΣΥΣΤΗΜΑΤΑ, Τύπος: Σύγγραμμα, Γεώργιος Δουκίδης, 2010, ΑΝΔΡΕΑΣ ΣΙΔΕΡΗΣ - ΙΩΑΝΝΗΣ ΣΙΔΕΡΗΣ & ΣΙΑ Ο.Ε., ISBN: 978-960-08-0528-4

11600 Η στρατηγική διαχείριση της τεχνολογίας και της καινοτομίας, Τύπος: Σύγγραμμα, White Margaret A.,Bruton Garry D., 2010, Κριτική, ISBN: 978-960-218-674-9

Additional material

(Ηλεκτρονικό Επιχειρείν και Ηλεκτρονικό ΕμπόριοD. ChaffeyΚλειδάριθμος, Αθήνα, 2008, ISBN: 978-960-461-171-3Knowledge Management and Virtual OrganizationsY. MalhotraIdea Group Publishing, Hershey, USA, 2000, ISBN: 1-878289-73-X)

WEB PROGRAMMING (ΠΛ0816) - AI

Coordinator: Georgiadis Christos

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Georgiadis Christos*

General competences

The student will be able to: (a) develop client-based scripts for web pages, using HTML, CSS, Javascript, and jQuery library, (b) develop server-side web applications using PHP and SQL databases.

Course content

Client-side programming: HTML tags, CSS rules, JAVASCRIPT (variables, operators, events, forms, validating fields, loops, DOM model), jQuery library.

Server-side programming: PHP (variables, arrays, super globals, processing forms, Sessions, Cookies, Files), PHP and MySQL.

Assessment

Written final examination 50%

Compulsory coursework 50%

Course bibliography

(One of the following):

12543770 Προγραμματισμός Internet & World Wide Web 4η Έκδοση, Τύπος: Σύγγραμμα, Deitel & Deitel, 2011, Α. Γκιούρδα & ΣΙΑ ΟΕ, ISBN: 978-960-512-612-4

13690 ΕΙΣΑΓΩΓΗ ΣΤΙΣ PHP 6 ΚΑΙ MYSQL 5 ΜΕ ΕΙΚΟΝΕΣ, Τύπος: Σύγγραμμα, LARRY ULLMAN, 2009, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-250-5

Additional material

Instructor's notes (Compus: http://compus.uom.gr/INF160/index.php) (Υλικό online μαθημάτων από το W3 schools (Compus: http://compus.uom.gr/INF160/index.php) (Compus))

WEB SERVICES AND TRANSACTIONS (ΠΛ0729) - AI

Coordinator: Georgiadis Christos

Semester: 8th (Spring) | **Course type: Elective AI** | **Weekly hours: 3** | **ECTS: 5**

Instructors: *Georgiadis Christos*

General competences

The student is introduced to basic concepts of Service-Oriented Architectures (SOA) and Web Services (WS) Platform Architecture. At the end of the course, he/she should be able to: (a) understand the functionality of the different layers in the WS stack; (b) model business processes and transactions using BPEL and design small to medium scale service compositions and orchestrations.

Course content

Service-Oriented Architecture (SOA): Interoperability, Services, Loose CouplingXML markup language and Messaging Framework: SOAP, WS AddressingDescribing and Discovering Metadata: WSDL, WS Policy, UDDIQuality of Service - Transactions: Reliable Messaging, Classic and Business TransactionsQuality of Service - WS Security: Trust, WS Authorization, Security Policy Service Composition: Modeling Business Processes: BPEL, case studies

Assessment

Course bibliography

(One of the following):

13613 ΑΡΧΙΤΕΚΤΟΝΙΚΗ ΠΛΑΤΦΟΡΜΑΣ ΥΠΗΡΕΣΙΩΝ ΙΣΤΟΥ, Τύπος: Σύγγραμμα, SANJIVA WEERAWARANA, FRANCISCO CURBERA, FRANK LEYMANN, TONY STOREY, DONALD F. FERGUSON, 2008, ΕΚΔΟΣΕΙΣ ΚΛΕΙΔΑΡΙΘΜΟΣ ΕΠΕ, ISBN: 978-960-461-086-0

Ελεύθερα συγγράμματα

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Additional material

Instructor's notes and slides. Scientific articles.

-Do more with SOA Integration: Best of Packt, A. Poduval, D. Todd, et al., Packt Publishing

-Instructor's website (Compus: http://compus.uom.gr/INF196/index.php) (Διαφάνειες του μαθήματος.Επιστημονικά άρθρα.

-Do more with SOA Integration: Best of Packt, A. Poduval, D. Todd, et al., Packt Publishing

-Ιστότοπος μαθήματος (Compus: http://compus.uom.gr/INF196/index.php) (Compus))