HELLENIC REPUBLIC
UNIVERSITY OF MACEDONIA

Study Guide

SCHOOL OF INFORMATION SCIENCES

Department of Applied Informatics

Programme of Study 2015-2016

Applied Informatics(AI)

Technology Management (TM)

Contents

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Head of the Department	*Vlachopoulou Maro*

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1st Semester

ALGORITHMS WITH C (ΠΛ0102-3)

Coordinator: **Sifaleras Angelo**
Semester: 1st (Winter) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Sifaleras Angelo, Koloniari Georgia*

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

Algorithms and Problems. Historical review, Definitions and properties of Algorithms, Computational problems, Description of algorithms, Basic concepts of algorithms (Iterative, Recursive, Stochastic, Heuristic).
Iterative Sorting Algorithms. Selection Sort, Bucket Sort, Bubble Sort, Radix Sort.
Searching Algorithms: Linear Search, Binary Search.
Data Structures: Stack, Queue, Cyclic queue, Linked lists (single and double), Heaps, Heap Sort.
Recursive Algorithms: Factorial, Fibonacci Numbers, Anoi Towers, Transformation from recursive to iterative.
Divide and conquer: Quick Sort, Merge Sort, Matrix Multiplication, Strassen Multiplication, Polynomial Multiplication.
Graph Algorithms: Depth First Search, Breadth First Search, Graph connectivity, Directed acyclic graphs.
Special Topics on Algorithms: On-line algorithms, Dynamic Programming, Greedy algorithms, Backtracking, Branch and Bound.
Laboratory. Implementation of basic sorting and searching algorithms using C.

Assessment

Written Final examination 100%
Coursework 30%

Course Bibliography

(One of the following):
Knuth, Donald Ervin. Η τέχνη του προγραμματισμού. Μεταφρ. Εμμανουήλ Ρουμελιώτης. Τόμ. τ. 1. Θεμελιώδεις Αλγόριθμοι. Θεσσαλονίκη: Εκδόσεις Τζιόλα, c2009. 3 τόμ.
Παπαρρίζος, Κωνσταντίνος. Ανάλυση και σχεδίαση αλγορίθμων. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2010.
Τσούρος, Κωνσταντίνος-Κλαύδιος. Αλγόριθμοι, προγράμματα, εφαρμογές με FORTRAN και Visual Basic. Θεσσαλονίκη, c2009

Additional material

Instructor's Notes and Slides

APPLIED MATHEMATICS I (ΠΛ0111)

Coordinator: **Stephanides George, Sifaleras Angelo**
Semester: 1st (Winter) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Stephanides George*

General Competences
The student is introduced to the basic concepts and methods of Linear Algebra with MATLAB.

Course Content
Matrices (Definitions – Properties of Operations – Introduction to MATLAB)
Linear Systems
Vector Spaces – Applications
Projections – Linear transformations
Eigenvalues - Egeinvectors

Assessment
Written Final examination 100%

Course Bibliography
(One of the following):
Στεφανίδης, Γεώργιος Χρ. Γραμμική άλγεβρα με το MATLAB. Νέα έκδ. Θεσσαλονίκη: Ζυγός, 2014.
Δονάτος, Γεώργιος Σ και Μαρία Χ Αδάμ. Γραμμική άλγεβρα: θεωρία και εφαρμογές. Αθήνα: Gutenberg, 2008.

Additional material
Instructor's Notes and Exercises

ENGLISH I (ΞΓ0101)

Coordinator: **Kantaridou Zoe**
Semester: 1st (Winter) | **Orientation:** Core Course | *Foreign Language* | **Weekly hours:** 4 | **ECTS:** 0
Instructors: *Kantaridou Zoe*

General Competences

English for Academic Purposes: Reading & Academic vocabulary. The course familiarizes students with the academic vocabulary in English and the skills and strategies needed to deal with academic texts in the fields of economics and informatics. It requires a minimum of B1 level of competence in English

Course Content

1. University campus and facilities
2. Great personalities in Computer Science
3. History of computers
4. Open source
5. Social networks6. Introductions to Economics
7. Dealing with academic abstracts8. Dealing with scientific articles
9. e-Business
10. Describing trends
11. Talking about Greece

Assessment

Course Bibliography

Kantaridou, Zoe. English for academic purposes : reading & vocabulary : student's book. 2nd ed., rev. Thessaloniki: University of Macedonia Press, 2011.
or
Karagevreki, Mersini. Text Analysis in Academic English. Thessaloniki: University of Macedonia Press, 2007.

Additional material

INTRODUCTION TO ECONOMICS (ΠΛ0105-2)

Coordinator: **Katsouli-Katou Helen**
Semester: 1st (Winter) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Katsouli-Katou Helen*

General Competences

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

Course Content

- Fundamental concepts and methodological approach
- Economic scarcity and social choice
- The framework and the mechanism of the market
- The role of the state
- National product, Unemployment, Inflation
- Consumption, Saving, Investment
- Income determination
- Income equilibrium
- Monetary policy
- External sector
- Economic policies
- The theory of choice and consumer demand
- Production and cost
- Types of markets

Assessment

Final written examinations 100%
Alternatively
Two progress examinations 100%

Course Bibliography

(One of the following):
Πουρναράκης, Ευθύμιος και Γιώργος Χατζηκωνσταντίνου. Αρχές οικονομικής: μακροοικονομική και μικροοικονομική. 3η έκδ. Αθήνα: Εκδόσεις Σοφία, 2011.
Παυλίτσας, Κωνσταντίνος Χ και Γεωργία Α Χαριτούδη. Εισαγωγή στην οικονομική. Κοζάνη: Εκδόσεις Παπαδοπούλου, 2011.

Additional material

Instructor's Notes and Transparencies

INTRODUCTION TO INFORMATICS (ΠΛ0101-2)

Coordinator: **Mamatas Eleftherios**
Semester: 1st (Winter) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Mamatas Eleftherios, Souravlas Stavros, Petridou Sofia*

General Competences

(a) To get familiar with the various branches of Computer Science; (b) to get a feeling of the various classes that will be taught during his/her studies.

Course Content

Introduction. Turing model, von Neumann model, Computer components
Number System. Positional number systems, Nonpositional number systems
Storing Data. Data types, Storing numbers - text - audio - images - video
Operations on Data. Logic operations, Shift operations, Arithmetic operations
System organization. Central processing unit, memory, storing devices, peripherals, bus.
Algorithms. Representation of Algorithms, Basic Algorithms, Recursion.
Programming Languages. Historical Review, Compilers, Interpreters.
Software Engineering. Life cycle of Software, Analysis Phase, Design Phase, Implementation Phase, Control Phase.
Data Structures. Records, Lists, Stacks, Queues, Trees, Binary Trees, Graphs.
Operation systems. Resource management.
Files and databases. Relational databases. SQL.
Computation theory. Abstract computation models. Turing machines.
Artificial Intelligence. Search. Knowledge representation and reasoning. Machine learning. Robotics.
Data compression. Lossless and lossy compression methods
Security. Security fundamentals - attacks - services - techniques

Assessment

Written Final examination 100%
Coursework 30%

Course Bibliography

(One of the following):
Forouzan, Behrouz A. και Firouz Mosharraf. Εισαγωγή στην επιστήμη των υπολογιστών. Αθήνα: Κλειδάριθμος, 2010.
Βενέρης, Γιάννης. Μίμησις πληροφορική: έννοιες και τεχνολογίες. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2007..

Additional material

Instructor's Notes and Slides

MANAGEMENT INFORMATION SYSTEMS (ΠΛ0113)

Coordinator: **Manthou Vassiliki**
Semester: 1st (Winter) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Manthou Vassiliki*

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

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

Assessment

Written Final examination 100%

Course Bibliography

(One of the following):
Laudon, Kenneth C. και Jane Price Laudon. Πληροφοριακά συστήματα διοίκησης. Αθήνα: Κλειδάριθμος, 2014.
Wallace, Patricia M. Πληροφοριακά συστήματα διοίκησης: άνθρωποι, τεχνολογία, διαδικασίες. Μεταφρ. Πρόδρομος Χατζόγλου. Αθήνα, 2014

Additional material

Instructor's Notes and Slides

PROCEDURAL PROGRAMMING (ΠΛ0106-3)

Coordinator: **Satratzemi Maria**
Semester: 1st (Winter) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Satratzemi Maria, Chatzigeorgiou Alexandros, Xinogalos Stylianos, Sakellariou Ilias*

General Competences

a) to understand the principles of procedural programming, b) to be able to develop programs on an integrated development environment, c) to obtain skills on the implementation of algorithms in the C programming language.

Course Content

Introduction to programming languages.
Integrated Development Environments.
Basic concepts of the C programming language: Types, operators and expressions.
Control Flow: Conditional Statements, Looping.
Procedural Programming: Functions, Pointers.
Data Structures: Arrays, Structures & Arrays of Structures
Input and Output: Files, Characters, Strings.
Use of the programming environment wx-devcpp.

Assessment

Written Examination 55%
Mid-term Examination 30%
Compulsory Assignments 15%

Course Bibliography

(One of the following):
Χατζηγιαννάκης, Νίκος Μ. Η γλώσσα C σε βάθος: πλήρης οδηγός εκμάθησης της γλώσσας C με εκτενή αναφορά στις δομές δεδομένων. 3η έκδ., βελτ. Αθήνα: Κλειδάριθμος, 2009
Τσελίκης, Γιώργος Σ, Τσελίκας, Νίκος Δ. C: από τη θεωρία στην εφαρμογή. 2η έκδ. Αθήνα, 2012
Roberts, Eric. Η τέχνη και επιστήμη της C. Μεταφρ. Γεώργιος Χρ Στεφανίδης και Αλέξανδρος Χατζηγεωργίου. Αθήνα: Κλειδάριθμος, 2004.

Additional material

Course website

2nd Semester

APPLIED MATHEMATICS II (ΠΛ0112)

Coordinator: **Hristou - Varsakelis Dimitrios**
Semester: 2nd (Spring) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Hristou - Varsakelis Dimitrios, Mamatas Eleftherios*

General Competences
Elements of Differential and Integral Calculus with Applications to Economics and Business.

Course Content
The Derivative (definition, rules). Partial Derivative. Studying a function by using derivatives (analysis, maximum and minimum points of a function with of without restrictions). Differential Equations. Elements from the theory of Differences. Applications to Economics and Business. Solving problems of Linear Algebra using MATLAB.
The study of basic results from Mathematical Analysis – introduction to differential and difference equations. Applications in Economics. Exploration of relevant computational tools using MATLAB.
Contents
Function differentiation - differentials
Differentiation of multivariable functions
Sequences, Series and Convergence
Taylor series and applications
Extrema of multivariable functions
Difference Equations – equilibrium points, stability
Differential Equations.

Assessment
Written Final examination 100%

Course Bibliography
(One of the following) :
Λουκάκης, Μανόλης. Πρόσκληση στα Μαθηματικά Οικονομικών και Διοικητικών Επιστημών. 1η. Τόμ. Β΄. Θεσσαλονίκη: Σοφία, 2014.
Hoy, Michael, και συν. Μαθηματικά Οικονομικών Επιστημών. Επιμ. Ιωάννης Κυρίτσης. Αθήνα: Gutenberg, 2012.

Additional material
Instructor's Notes

DATA STRUCTURES (ΠΛ0201)

Coordinator: **Satratzemi Maria**
Semester: 2nd (Spring) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Satratzemi Maria, Koloniari Georgia*

General Competences

The 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. b) the development of methods of representation for the objects of abstract data models and the implementation of their functions in procedural programming language C.

Course Content

Introduction to Data Structures.
Stacks, Basic operations, implementing stacks with arrays and records, application of stacks.
Queues, Basic operations, implementing Queues with arrays and records, application of Queues.
Lists, Basic operations, sequential storage implementation of Lists.
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.
Linked implementation of sparse polynomials.
Binary Trees, basic operations. A pointer-based implementation of Binary Trees. A recursive implementation of Binary trees.
Application of Binary Trees: Huffman Codes.
Hashing, open probing, Chaining.
B-Trees. AVL Trees, basic operations.

Assessment

Written Examination 80%
Compulsory Assignments 20%

Course Bibliography

(One of the following):
Μισυρλής, Νικόλαος. Δομές Δεδομένων με C. Αθήνα, 2008.
Sahni, Sartaj. Δομές δεδομένων, αλγόριθμοι και εφαρμογές στη C++. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2004.
Μποζάνης, Μποζάνης. Δομές δεδομένων. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2006.
Τσούρος, Κωνσταντίνος-Κλαύδιος. Αλγόριθμοι, προγράμματα, εφαρμογές με FORTRAN και Visual Basic. Θεσσαλονίκη, c2009

Additional material

Course website

DISCRETE MATHEMATICS (ΠΛ0108-3)

Coordinator: **Stephanides George**
Semester: 2nd (Spring) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Stephanides George, 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):

Στεφανίδης, Γεώργιος Χρ. Διακριτά μαθηματικά. Θεσσαλονίκη: Ζυγός, 2015.
Shoup, Victor. Μια υπολογιστική εισαγωγή στη θεωρία αριθμών και την άλγεβρα. Αθήνα: Κλειδάριθμος, 2007.
Epp, Susanna S. Διακριτά μαθηματικά με εφαρμογές. 2η βελτ. έκδ. Αθήνα: Κλειδάριθμος, 2010.

Additional material

ENGLISH II (ΞΓ0102)

Coordinator: Kantaridou Zoe
Semester: 2nd (Spring) | **Orientation:** Core Course | *Foreign Language* | **Weekly hours:** 4 | **ECTS:** 5
Instructors: *Kantaridou Zoe*

General Competences

Writing in English for Academic PurposesEnglish for Academic Purposes: Reading & Academic vocabularyThe course provides extensive practice in writing in English for Academic Purposes. Rephrasing, summarizing, description of tables and graphs and argument support are mainly practiced through academic and journalistic texts on the topics of informatics and economics. The course requires a minimum B1 level of competence in English.

Course Content

The role of the media, Globalisation, The Free market, e-Business, Social Media, European statistics.

Assessment

Course Bibliography

Rizouli, Klio. English for Academic Purposes - Focus on Writing. Θεσσαλονίκη: Εταιρία Αξιοποίησης και Διαχείρισης της Περιουσίας του Πανεπιστημίου Μακεδονίας, 2015.
ή
Pallant, Anne. English for Academic Study: Writing - Course Book. 2η. Ανδρέας Μπέτσης, 2009.

Additional material

FINANCIAL ACCOUNTING (ΠΛ0502-1)

Coordinator: **Vazakidis Athanasios**
Semester: 2nd (Spring) | **Orientation:** Core Course | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Vazakidis Athanasios, Stavropoulos Antonios, Dasilas Apostolos*

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) :
Σταυρόπουλος, Αντώνιος, Αθανάσιος Βαζακίδης και Σταύρος Τσόπογλου. Χρηματοοικονομική λογιστική, λογιστικό σχέδιο. 2η έκδ. συμπληρωμένη και βελτ. Θεσσαλονίκη, 2010.
Καραγιάννης, Δημήτρης Ι, Ιωάννης Δ Καραγιάννης και Αικατερίνη Δ Καραγιάννη. Παραδείγματα εφαρμογής και ανάλυσης του γενικού λογιστικού σχεδίου: στην πράξη. 8η έκδ., ενημερωμένη με τους τελευταίους νόμους. Θεσσαλονίκη, 2011.

Additional material

INTRODUCTION TO ALGORITHM ANALYSIS (ΠΛ0509-2)

Coordinator: **Satratzemi Maria**
Semester: 2nd (Spring) | **Orientation:** Core Course | *Compulsory*| **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

Theory: The concepts of computational problem and algorithm, Asymptotic analysis (The asymptotic symbols O, Θ, Ω, o and ω, Properties of the asymptotic symbols, The value of Algorithm analysis), The concept of algorithm complexity (Worst, best and average case, Homogeneous and non homogeneous algorithms), Computational models, Analysis of iterative algorithms, Analysis of recursive and divide and conquer algorithms, Analysis of greedy algorithms, Analysis of dynamic programming algorithms, Graph algorithms (Breath first search, Depth first search, Topological order, Bipartite graphs, connectivity).Laboratory: Algorithm programming and computational studies to evaluate the practical complexity of algorithms.

Assessment

Written Final examination 100%

Course Bibliography

(One of the following) :

Cormen, Thomas H. Εισαγωγή στους αλγορίθμους. Επιμ. Γεώργιος Φρ Γεωργακόπουλος, και συν. Μεταφρ. Ιωάννης Παπαδόγγονας. 1η έκδ. σε ενιαίο τόμο. Ηράκλειο: Πανεπιστημιακές Εκδόσεις Κρήτης, 2012.
Παπαρρίζος, Κωνσταντίνος. Ανάλυση και σχεδίαση αλγορίθμων. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2010.
Kleinberg, Jon και Éva Tardos. Σχεδιασμός αλγορίθμων. Αθήνα: Εκδόσεις Κλειδάριθμος, 2008.
Levitin, Anany. Ανάλυση και σχεδίαση αλγορίθμων. Επιμ. Μάνος Ρουμελιώτης. Μεταφρ. Ευθύμιος Κότσιαλος. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2008.

Additional material

Course website

STATISTICS I (ΠΛ0104)

Coordinator: **Papanastasiou Demetrios**
Semester: 2nd (Spring) | **Orientation:** Core Course | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Papanastasiou Demetrios*

General Competences

The course aims to introduce the basic rules in related fields of descriptive and inductive statistics, familiarity with the concept of one-dimensional random variable and the mean/variance and finally getting to know the major discrete and continuous distributions. As part of the course, there are various applications of probability theory that are of practical interest.

Course Content

Populations - samples, sampling, position and dispersion measures, propensities, tables, introduction to probabilities, random variable, theoretical and derived distributions.

Assessment

Written Final examination 100%

Course Bibliography

(One of the following) :
Ross, Sheldon M. Βασικές αρχές θεωρίας πιθανοτήτων. Αθήνα: Κλειδάριθμος, 2010.
Μπερτσεκάς, Δ. και Γ. Τσιτσικλής. Εισαγωγή στις πιθανότητες. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2010.

Additional material

Instructor's Notes and Slides

3rd Semester

COMPUTER ARCHITECTURE (ΠΛ0304-1)

Coordinator: **Roumeliotis Manos**
Semester: 3rd (Winter) | **Orientation:** AI | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Roumeliotis Manos, 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):
Ρουμελιώτης, Εμμανουήλ; Σουραβλάς, Σταύρος Ι. Ψηφιακή σχεδίαση : αρχές και εφαρμογές. Θεσσαλονίκη : Εκδόσεις Τζιόλα, 2012.
Stallings, William. Οργάνωση και αρχιτεκτονική υπολογιστών. 8η Έκδοση. Θεσσαλονίκη : Εκδόσεις Τζιόλα, 2011.
Πεκμεστζή, Κ. (Κιαμάλ).
Συστήματα Μικροϋπολογιστών, ΤΟΜΟΣ Ι: Μικροεπεξεργαστές 80x86 Pentium και ARM. Αθήνα : Συμμετρία, 2009.
Patterson, David A; Hennessy, John L; Γκιζόπουλος, Δημήτρης. Οργάνωση και σχεδίαση υπολογιστών : η διασύνδεση υλικού και λογισμικού. Αθήνα : Κλειδάριθμος, c2010.
Tanenbaum, Andrew S. Η αρχιτεκτονική των υπολογιστών : μία δομημένη προσέγγιση. 4η Έκδοση. Αθήνα : Κλειδάριθμος, 2000.

Additional material

DATABASES I (ΠΛ0501-1)

Coordinator: **Evangelidis Georgios**
Semester: 3rd (Winter) | **Orientation:** AI | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Evangelidis Georgios, Koloniari Georgia*

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 80%
Coursework 20%

Course Bibliography

(One of the following):
Ramakrishnan, Raghu; Gehrke, Johannes. Συστήματα διαχείρισης βάσεων δεδομένων. 3η Έκδοση. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2012.
Connolly, Thomas M; Begg, Carolyn E., Βάσεις δεδομένων. Τόμος Α΄. 4η Έκδοση. Αθήνα : Μ. Γκιούρδας, 2008.

Additional material

Instructor's Notes and Transparencies

DIGITAL ECONOMICS (ΠΛ0316)

Coordinator: **Stiakakis Emmanuil**
Semester: 3rd (Winter) | **Orientation:** AI | *Compulsory* | **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):
Στειακάκης, Εμμανουήλ. Ψηφιακή οικονομική. Θεσσαλονίκη : Ανικούλα, c2013.
Μασούλας, Βασίλης. Η διοίκηση & ανάπτυξη στη νέα οικονομία : με τις μεθόδους Six Sigma, ORDIC, & Changeland σε επιχειρήσεις, πανεπιστήμια & πόλεις γνώσης. Αθήνα : Κλειδάριθμος, c2008.

Additional material

ENGLISH III (ΞΓ0103)

Coordinator: **Kantaridou Zoe**
Semester: 3rd (Winter) | **Orientation:** AI | *Foreign Language* | **Weekly hours:** 4 | **ECTS:** 5
Instructors: *Kantaridou Zoe*

General Competences

Business English The course familiarizes students with topics and conventions of speaking and writing in English in the international business environment. Students prepare their CVs and cover letters for selected real job advertisements and present the profile of a company in the field of informatics or graphics design. Professional skills such as telephoning, letter writing, emails, turn-taking in negotiations and intercultural communication awareness skills are practiced. Content

Course Content

1. Company profiles2. Company structure3. Advertising & marketing4. e-Commerce5. Applying for a job6. Telecommuting7. Business across cultures8. Business etiquette9. Company accountability10. SWOT analysis

Assessment

Course Bibliography

(One of the following):
Kantaridou, Z. (Zoe); Papadopoulou, Iris; Stefanou, Polyxeni. Business English for academic purposes. Θεσσαλονίκη: Ανικούλα, 2008
Georgatsou, Y. (Yvonne); Liarommati, M. (Mary). English for students of management. 2nd ed. Θεσσαλονίκη: University Studio Press, 1995.

Additional material

FINANCE (ΠΛ0502)

Coordinator: **Tsopoglou Stavros**
Semester: 3rd (Winter) | **Orientation:** AI | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Tsopoglou Stavros, 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. Ability to use these concepts as tools of analyzing the function of finance in firms.
3. Decision making based on the results of the specific financial analysis.
4. Competence in using spreadsheet type of software to solve problems in finance.

Course Content

1. BASIC CONCEPTS IN FINANCE AND THE FINANCIAL ENVIRONMENT.
2. COMPARATIVE ANALYSIS OF FINANCIAL STATEMENTS
3. SOURCES AND USES OF FUNDS
4. WORKING CAPITAL-REVENUE-COST PLANNING AND CONTROL
5. TIME VALUE OF MONEY AND CAPITAL BUDGETING
6. MONEY AND CAPITAL MARKETS (SOURCES OF FUNDS)
7. USE OF SPREADSHEETS (MS EXCEL TYPE) IN SOLVING PROBLEMS IN FINANCE
8. PREPARING AND COMPLETING A CASE STUDY (USE OF WEB BASED FINANCIAL DATABASES AND PRESENTATION OF A FINANCIAL ANALYSIS FOR A SPECIFIC ENTERPRISE)

Assessment

Written final examination 100%
Optional coursework (Case Study) 10%
Optional exercises 10%

Course Bibliography

(One of the following):
Weston, J. Fred (John Fred); Brigham, Eugene F. Βασικές αρχές της χρηματοοικονομικής διαχείρισης και πολιτικής. Αθήνα : Παπαζήσης, 1986.
Brealey, Richard A; Myers, Stewart C; Allen, Franklin. Αρχές χρηματοοικονομικής των επιχειρήσεων. Αγία Παρασκευή, [Αττική] : Utopia, c2013.

Additional material

OBJECT- ORIENTED PROGRAMMING (ΠΛ0401)

Coordinator: **Chatzigeorgiou Alexander**
Semester: 3rd (Winter) | **Orientation:** AI | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Chatzigeorgiou Alexander, Xinogalos Stylianos*

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):
Lervik, Else; Havdal, Vegard B. Java με UML : αντικειμενοστρεφής σχεδίαση και προγραμματισμός. Αθήνα : Κλειδάριθμος, c2004-2005
Roberts, Eric. Η τέχνη και επιστήμη της Java : μια εισαγωγή στην επιστήμη των υπολογιστών. Αθήνα : Κλειδάριθμος, c2008
Barnes, D. (David J.); Kölling, Michael. Αντικειμενοστρεφής προγραμματισμός σε Java : μια πρακτική εισαγωγή με χρήση του BlueJ. Αθήνα : Κλειδάριθμος, c2008.
Savitch , Walter. JAVA : μια εισαγωγή στην επίλυση προβλημάτων και στον προγραμματισμό. 7η Έκδοση. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2015

Additional material

STATISTICS II (ΠΛ0202)

Coordinator: **Papanastasiou Demetrios**
Semester: 3rd (Winter) | **Orientation:** AI | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Papanastasiou Demetrios*

General Competences

A student must be able to make decisions by analyzing properly the statistical data in hand, using the free source software R. It is an introduction to the basics, such as (a) statistical hypothesis testing and confidence intervals, and (b) the linear regression model.

Course Content

Statistical data (introduction to R, entry and presentation of data)
Basic Inference (sample, LLN, CLT, point estimation, confidence intervals for means, proportions and variances)
Hypothesis Testing (fundamental notions, testing for means, proportions and variances, χ2-tests, ANOVA)
Regression Analysis (fundamental notions, diagnostic checking, case studies)
Sampling Methods (fundamental methods)

Assessment

Written examination, a four (4) question paper, very similar to those taught in the class. Some questions include R-code and print out, with which students should be familiar.

Course Bibliography

(One of the following):
Κολυβά-Μαχαίρα, Φωτεινή; Μπόρα-Σέντα, Ευθυμία. Στατιστική : θεωρία, εφαρμογές. 2η Έκδοση βελτιωμένη και επαυξημένη. Θεσσαλονίκη : Εκδόσεις Ζήτη, c2013.
Crawley M.J. Στατιστική Ανάλυση με το R. Broken Hill Publishers LTD, 2013.
Παπαδημητρίου, Γιάννης Δ. Στατιστική. Αθήνα : Τυπωθήτω - Γιώργος Δαρδανός, 2005

Additional material

COMPUTER ARCHITECTURE (ΠΛ0304-1)

Coordinator: **Roumeliotis Manos**
Semester: 3rd (Winter) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Roumeliotis Manos, 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

Written final examination 100%

Course Bibliography

(One of the following) :
Ρουμελιώτης, Μάνος και Σταύρος Ι. Σουραβλάς. Ψηφιακή σχεδίαση: αρχές και εφαρμογές. 1η έκδ. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2013.
Stallings, William. Οργάνωση και αρχιτεκτονική υπολογιστών. 8η έκδοση. Θεσσαλονίκη: Εκδόσεις Τζιόλα, 2011
Πεκμεστζή, Κιαμάλ. Συστήματα μικροϋπολογιστών. 1η έκδοση. Τόμ. Τόμος 1. Αθήνα: Συμμετρία, 2009.
Patterson, David A. και John L. Hennessy. Οργάνωση και σχεδίαση υπολογιστών: η διασύνδεση υλικού και λογισμικού. Μεταφρ. Δημήτρης Γκιζόπουλος. 4η έκδοση. Τόμ. Τόμος Α΄. Αθήνα: Κλειδάριθμος, 2010.
Tanenbaum, Andrew S. Η αρχιτεκτονική των υπολογιστών: μία δομημένη προσέγγιση. 4η Έκδοση. Αθήνα: Κλειδάριθμος, 2000.

Additional material

Instructor's Website

COMPUTER NETWORKS (ΠΛ0503-2)

Coordinator: **Fouliras Panayotis**
Semester: 3rd (Winter) | **Orientation:** TM | *Compulsory* | **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

Course Bibliography

(One of the following) :
Comer, Douglas. Δίκτυα και διαδίκτυα υπολογιστών. Αθήνα: Κλειδάριθμος, 2014.
Tanenbaum, Andrew S. και David J. Wetherall. Δίκτυα υπολογιστών. Αθήνα: Κλειδάριθμος, 2011.

Additional material

MANAGEMENT AND TECHNOLOGY (ΔΤ1301)

Coordinator: **Fouskas Konstantinos**
Semester: 3rd (Winter) | **Orientation:** TM | *Compulsory* | **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

Course Bibliography

(One of the following) :

Τζωρτζάκης, Κώστας Μ. και Αλεξία Τζωρτζάκη. Οργάνωση & διοίκηση: το μάνατζμεντ της νέας εποχής. 4η έκδοση. Αθήνα: Rosili, 2008.

Roberts, Eric. Η τέχνη και επιστήμη της C. Μεταφρ. Γεώργιος Χρ Στεφανίδης και Αλέξανδρος Χατζηγεωργίου. Αθήνα: Κλειδάριθμος, 2004.

Additional material

OBJECT- ORIENTED PROGRAMMING (ΠΛ0401)

Coordinator: **Chatzigeorgiou Alexander**
Semester: 3rd (Winter) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Chatzigeorgiou Alexander, Xinogalos Stylianos*

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) :
Lervik, Else και Vegard B. Havdal. Java με UML: αντικειμενοστρεφής σχεδίαση και προγραμματισμός. Αθήνα: Κλειδάριθμος, 2004.
Roberts, Eric. Η τέχνη και επιστήμη της Java: μια εισαγωγή στην επιστήμη των υπολογιστών. Αθήνα: Κλειδάριθμος, 2008.
Barnes, David J. και Michael Kölling. Αντικειμενοστρεφής προγραμματισμός σε Java: μια πρακτική εισαγωγή με χρήση του BlueJ. Αθήνα: Κλειδάριθμος, 2008.
Savitch, Walter J. Java: an introduction to problem solving & programming. 7th ed. Upper Saddle River, N.J: Pearson Prentice Hall, 2015.

Additional material

PROBABILITY AND STATISTICS (ΔΤ2101)

Coordinator: **Nikolaidis Ioannis**
Semester: 3rd (Winter) | **Orientation:** TM | *Compulsory* | **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.

Assessment

Course Bibliography

(One of the following):
Κουτρουβέλης, Ιωάννης. Εφαρμοσμένες Πιθανότητες και Στατιστική. 2η έκδοση. Πάτρα: Gotsis, 2015.
Ψωινός, Δημήτριος Π. Στατιστική. Θεσσαλονίκη: ΖΗΤΗ, 1999.

Additional material

WEB TECHNOLOGIES (ΔΤ2703)

Coordinator: **Kaskalis Theodoros**
Semester: 3rd (Winter) | **Orientation:** TM | *Compulsory* | **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):
Meloni, Julie C. Μάθετε HTML 5, CSS και JavaScript Όλα σε Ένα. Αθήνα: Μ. Γκιούρδας, 2013.
Lemay, Laura και Rafe Colburn. Πλήρες Εγχειρίδιο της HTML 5 & CSS. Αθήνα: Μ. Γκιούρδας, 2011.

Additional material

4th Semester

COMPUTER GRAPHICS AND VIRTUAL REALITY (ΠΛ0419)

Coordinator: **Manitsaris Athanasios**
Semester: 4th (Spring) | **Orientation:** AI | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Manitsaris Athanasios*

General Competences

Course Content

Assessment
Written examination 100%

Course Bibliography
(One of the following):
Θεοχάρης, Θ. Α; Μπεμ, Α. (Αλέξανδρος). Γραφικά : αρχές & αλγόριθμοι. Αθήνα : Συμμετρία, 1999.
Θεοχάρης, Θ. Α. Γραφικά και οπτικοποίηση : αρχές και αλγόριθμοι. Αθήνα : Συμμετρία, 2010

Additional material
Instructor's Notes and Slides

DATABASES II (ΠΛ0601)

Coordinator: **Evangelidis Georgios**
Semester: 4th (Spring) | **Orientation:** AI | *Compulsory* | **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
DBMS Architecture
Storing Data: Disks and Files
File Structures and Indexes
Tree IndexesHash-based Indexes
External Sorting
Relational Operators
Query Optimization
Transaction Management/Concurrency Control
Recovery
DBMS Connectivity- PHP and MySQL

Assessment
Written Final examination 80%
Coursework 20%

Course Bibliography
(One of the following):
Elmasri, Ramez; Navathe, Sham. Θεμελιώδεις αρχές συστημάτων βάσεων δεδομένων. Αθήνα : Δίαυλος, c2012.
Silberschatz, Abraham; Korth, Henry F; Sudarshan, S. Συστήματα βάσεων δεδομένων. Αθήνα : Μ. Γκιούρδας, 2011.

Additional material
Instructor's Notes and Slides

ENGLISH IV (ΞΓ0104)

Coordinator: **Kantaridou Zoe**
Semester: 4th (Spring) | **Orientation:** AI | *Foreign Language*| **Weekly hours:** 4 | **ECTS:** 5
Instructors: *Kantaridou Zoe*

General Competences

Oral presentations in English TThe course familiarizes students with the skills needed to prepare and deliver an oral presentation in English whether in the academic or work environment. Potential causes of speech apprehension (stage fright) are discussed and analysed. Model speeches are analysed and introductory/ concluding and techniques for attracting the audience attention are practiced.

Course Content

The importance of argumentation and public speaking in the academic and work environment.Causes of speech apprehension and strategies to deal with itIntroductory and concluding techniquesDeveloping rapport with the audienceAnalysis of model speeches (use of selected speeches from www.ted.com)Preparation and delivery of an oral presentation

Assessment

Course Bibliography

(One of the following):
Mahili, Ifigenia.Public Speaking for University Students, 2η Έκδοση, Θεσσαλονίκη: Εκδόσεις Ανικούλα, 2015
Diamantis, Gabriel V. English for academic discussion classes. Αθήνα: Εκδόσεις Σταμούλη, 2008.

Additional material

LINEAR AND NETWORK PROGRAMMING (ΠΛ0313-2)

Coordinator: **Samaras Nikolaos**
Semester: 4th (Spring) | **Orientation:** AI | *Compulsory* | **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):
Παπαρρίζος, Κωνσταντίνος. Γραμμικός προγραμματισμός : μια προσέγγιση με MATLAB. Θεσσαλονίκη : Ζυγός, 2009.
Παπαρρίζος, Κωνσταντίνος; Σαμαράς, Νικόλαος; Σιφαλέρας, Άγγελος. Δικτυακή βελτιστοποίηση. Θεσσαλονίκη : Ζυγός, 2009
Οικονόμου, Γιώργος Σ; Γεωργίου, Ανδρέας Κ. Ποσοτική ανάλυση για τη λήψη διοικητικών αποφάσεων. Αθήνα : Εκδόσεις Ε. Μπένου, 2006-2011.
Λουκάκης, Μανόλης. Γραμμικός προγραμματισμός, αριστοποίηση σε δίκτυα. Θεσσαλονίκη : Σοφία, 1994

Additional material

Instructor's Notes and Slides

MACROECONOMIC MODELS AND POLICIES (ΠΛ0403-2)

Coordinator: **Dritsakis Nikolaos**
Semester: 4th (Spring) | **Orientation:** AI | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Dritsakis Nikolaos, Dasilas Apostolos*

General Competences

This course provides a comprehensive overview of macroeconomics. Students will understand principal macroeconomic concepts and comprehend the function of an open economy in a free market as well as in a gross economy. The aim of this course is to introduce the students with macroeconomic models given their forecasting influence, the exertion of economic policy and also the forecasting of future values in economic variables.

Course Content

1. OF MACROECONOMICS AND NATIONAL ACCOUNTS
1.1 of Macroeconomics
1.2 Aims and scope of Macroeconomics Policy
1.3 Categories of Macroeconomic Variables
1.4 Circular Flow Model
1.5 Fundamental Macroeconomic Identities
1.6 Gross Domestic Product
2. GROSS DOMESTIC PRODUCT (GDP)
2.1 Definition
2.2 Nominal, Real, Potential GDP
2.3 Per capita GDP and Economic Well-Being
2.4 Approaches used to measure GDP
2.5 GDP: Expenditures Approach
2.6 GDP: Income Approach
2.7 GDP as Added Value
2.8 Problems when using GDP
3. UNEMPLOYMENT, INFLATION, INTEREST RATES
3.1 Introduction
3.2 Unemployment
3.3 Price level and Deflator
3.4 Inflation
3.5 Nominal and Real Interest Rates
3.6 Consequences of Inflation
3.7 Labour Productivity and Economic Growth
4. AGGREGATE DEMAND MODEL
4.1 Aggregate Demand and its contents
4.2 Consumption
4.3 Investment
4.4 Government Expenditure of Goods and Services
4.5 Aggregate Demand Curve
5. AGGREGATE SUPPLY CURVE
5.1 Introduction
5.2 Equilibrium Product and Automatic Mechanism
5.3 Stagflation
6. EQUILIBRIUM FROM DEMAND SIDE AND THE MULTIPLIER Equilibrium from demand side A simple Macroeconomic Model Multiplier of autonomous expenditure and autonomous taxes Multiplier of balanced budget The paradox of thrift
7. PUBLIC POLICY AND PUBLIC DEBT Definition and Problems of Public Policy Public deficit and debt Should the budget be balanced every year
8. MONEY Money supply function Money demand function
9. KEYNESIANISM AND MONETARISM Introduction Modern money theory (monetarism) Money demand function

Assessment

Written examination 100%

Course Bibliography

(One of the following):
Χατζηνικολάου, Δημήτρης. Εισαγωγή στη μακροοικονομική : με στοιχεία από την ελληνική οικονομία. Ιωάννινα : [χ.ό.], 2011.
Δημέλη, Σοφία Π. Μακροοικονομικά μεγέθη και ανάπτυξη της ελληνικής οικονομίας. Αθήνα : Εκδόσεις ΟΠΑ, 2010.

Additional material

Journalism:

Hondroyiannis, G. (2000). The wage growth and inflation nexus in a dynamic multivariate context: New evidence from Greece. International Economic Journal, Vol.17, No.1, pp. 121 – 138.

Pereira A., and Xu, Z., (2000). Export growth and domes

OPERATING SYSTEMS (ΠΛ0404)

Coordinator: **Roumeliotis Manos**
Semester: 4th (Spring) | **Orientation:** AI | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Roumeliotis Manos, Souravlas Stavros*

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

Written final examination 100-70%
Optional 3 (three) Courseworks 0-30%

Course Bibliography

(One of the following):
Stallings , William. Λειτουργικά συστήματα : Αρχές Σχεδίασης. Εκδόσεις Τζιόλα 2015.
Tanenbaum, Andrew S. Σύγχρονα λειτουργικά συστήματα. Αθήνα : Κλειδάριθμος, c2009.

Additional material

Instructor's website

SOFTWARE ENGINEERING (ΠΛ0613)

Coordinator: **Chatzigeorgiou Alexander**
Semester: 4th (Spring) | **Orientation:** AI | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Chatzigeorgiou Alexander*

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):
Χατζηγεωργίου, Αλέξανδρος. Αντικειμενοστρεφής σχεδίαση : UML, αρχές, πρότυπα και ευρετικοί κανόνες. Αθήνα : Κλειδάριθμος, c2005.
Γερογιάννης, Βασίλης Χ; Φιτσιλής, Πάνος. Αντικειμενοστρεφής ανάπτυξη λογισμικού με τη UML. Αθήνα : Κλειδάριθμος, c2006.
Γιακουμάκης, Εμμ. Α; Διαμαντίδης, Νικόλαος Α. Τεχνολογία λογισμικού. Αθήνα : Αθ. Σταμούλης, c2009.

Additional material

DATA ORGANIZATION AND MANAGEMENT (ΔΤ2202)

Coordinator: **Koloniari Georgia**
Semester: 4th (Spring) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Koloniari Georgia*

General Competences

The goal of this course is for students to learn the basic techniques for organizing data, as well as corresponding algorithms and languages for the management of this data. At the end of the course, the students should, given a specific application that requires the use of a database, be able to design and implement the application successfully.

Course Content

The course will cover the following topics:'• Review basic data structures (arrays, lists, trees)• Introduction to Database Management Systems (DBMS)• Entity-Relationship (ER) Model• Relational Model• ER to Relational Schema• Relational Algebra• SQL• Functional Dependencies - Normal Forms• Data Storage & Organization• Indexes (tree-based, hashing)

Assessment

Course Bibliography

(One of the following):
Ramakrishnan, Raghu; Gehrke, Johannes. Συστήματα διαχείρισης βάσεων δεδομένων. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2012.
Elmasri, Ramez; Navathe, Sham. Θεμελιώδεις αρχές συστημάτων βάσεων δεδομένων. Αθήνα : Δίαυλος, c2012

Additional material

DIGITAL TELECOMMUNICATIONS SYSTEMS (ΔΤ2701)

Coordinator: Psannis Konstantinos
Semester: 4th (Spring) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Psannis Konstantinos*

General Competences

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, Algorithms for Communications Systems and their Applications- Information Theory/quantitative theory of information and its applications to reliable, efficient communication systems.

Assessment

Course Bibliography
(One of the following):
Rice, Michael. Ψηφιακές επικοινωνίες : μια προσέγγιση διακριτού χρόνου. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2009.
Proakis, John G; Salehi, Masoud. Digital communications. Boston : McGraw-Hill, 2008.

Additional material

INTERNET TECHNOLOGIES (ΔΤ2702)

Coordinator: **Kaskalis Theodoros**
Semester: 4th (Spring) | **Orientation:** TM | *Compulsory*| **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):

Ullman, Larry E. (Larry Edward). Εισαγωγή στις PHP 6 & MYSQL 5 : με εικόνες. Αθήνα : Κλειδάριθμος, c2009.
Welling, Luke; Thomson, Laura. Ανάπτυξη Web εφαρμογών με PHP και MySQL. Αθήνα : Μ. Γκιούρδας, 2011.

Additional material

OPERATING SYSTEMS (ΠΛ0404)

Coordinator: **Roumeliotis Manos**
Semester: 4th (Spring) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Roumeliotis Manos, Souravlas Stavros*

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):
Stallings , William. Λειτουργικά συστήματα : Αρχές Σχεδίασης. Θεσσαλονίκη : Εκδόσεις Τζιόλα 2014.
Tanenbaum, Andrew S. Σύγχρονα λειτουργικά συστήματα. Αθήνα : Κλειδάριθμος, c2009

Additional material

OPERATIONS RESEARCH (ΔΤ2102)

Coordinator: **Sifaleras Angelo**
Semester: 4th (Spring) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Sifaleras Angelo*

General Competences

This course aims to an introduction to the theory and applications of Operational Research (O.R.). Emphasis will be given to linear programming, mathematical modelling, algorithmic solution methodologies, and presentation of modern applications of decision making in the technology sector.

Course Content

The course covers the following topics: Graphical solution procedure of a linear model & special cases, linear programming applications – case studies, optimization software packages (e.g., AMPL, POM-QM for Windows, Excel Solver), the Simplex algorithm, duality theory and economic interpretation, sensitivity analysis. The transportation problem and its applications in practice.

Assessment

Course Bibliography

(One of the following):

Παπαρρίζος, Κωνσταντίνος. Γραμμικός προγραμματισμός : μια προσέγγιση με MATLAB. Θεσσαλονίκη : Ζυγός, 2009.
Οικονόμου, Γιώργος Σ; Γεωργίου, Ανδρέας Κ. Επιχειρησιακή έρευνα για τη λήψη διοικητικών αποφάσεων. Αθήνα : Εκδόσεις Γ. Μπένου, 2011.
Τσάντας, Νικόλαος Δ; Βασιλείου, Π.-Χ. Γ. (Παναγιώτης-Χρήστος Γ.). Εισαγωγή στην επιχειρησιακή έρευνα. Θεσσαλονίκη : Ζήτης, 2000.
Anderson David R., Sweeney Dennis J., Williams Thomas A., Martin Kipp. Διοικητική επιστήμη : ποσοτικές μέθοδοι για τη λήψη επιχειρηματικών αποφάσεων. Αθήνα : Κριτική, 2014 .

Additional material

PRODUCTION AND OPERATIONS MANAGEMENT (ΔΤ2301)

Coordinator: **Stiakakis Emmanuil**
Semester: 4th (Spring) | **Orientation:** TM | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Stiakakis Emmanuil, Nikolaidis Ioannis*

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):
Δημητριάδης, Σωτήριος Γ; Μιχιώτης, Αθανάσιος Ν. Διοίκηση παραγωγικών συστημάτων. Αθήνα : Κριτική, 2007.
Παππής, Κώστας Π. Διοίκηση παραγωγής : ο σχεδιασμός παραγωγικών συστημάτων. 2η Έκδοση. Αθήνα : Εκδόσεις Αθ. Σταμούλης, c2008

Additional material

5th Semester

COMPUTER NETWORKS (ΠΛ0503-2)

Coordinator: **Fouliras Panayotis**
Semester: 5th (Winter) | **Orientation:** AI | *Compulsory*| **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):
Comer, Douglas. Δίκτυα και διαδίκτυα υπολογιστών. 6η Έκδοση. Αθήνα : Κλειδάριθμος, c2014
Tanenbaum, Andrew S; Wetherall, David. Δίκτυα υπολογιστών. 5η Έκδοση. Αθήνα : Κλειδάριθμος, c2011

Additional material

COMPUTERIZED ACCOUNTING (ΠΛ0803)

Coordinator: **Vazakidis Athanasios**
Semester: 5th (Winter) | **Orientation:** AI | *Compulsory* | **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):
Βαζακίδης, Αθανάσιος Π; Σταυρόπουλος, Αντώνιος Α; Χατζής, Αναστάσιος. Λογιστικό σχέδιο, μηχανογράφηση λογιστηρίου. Θεσσαλονίκη : [χ.ό.], 2010.
Γκίνογλου, Δημήτρης; Ταχυνάκης, Παναγιώτης; Πρωτόγερος, Νικόλαος.Λογιστικά πληροφοριακά συστήματα : μηχανογραφημένη λογιστική. Γέρακας : Rosili, c2004.

Additional material

Instructor's notes and slides

ECONOMETRICS I (ΠΛ0504)

Coordinator: **Dritsakis Nikolaos**
Semester: 5th (Winter) | **Orientation:** AI | *Compulsory*| **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):
Δριτσάκη, Χάϊδω Ν; Δριτσάκη, Μελίνα Ν. Εισαγωγή στην οικονομετρία : με τη χρήση του λογισμικού EViews. Αθήνα : Κλειδάριθμος, c2013.
Τζαβαλής, Ηλίας. Οικονομετρία. Αθήνα : Εκδόσεις ΟΠΑ, 2008.

Additional material

MARKETING INFORMATION SYSTEMS (ΠΛ0114)

Coordinator: **Vlachopoulou Maro**
Semester: 5th (Winter) | **Orientation:** AI | *Compulsory*| **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):
Βλαχοπούλου, Μάρω; Δημητριάδης, Σέργιος. Ηλεκτρονικό επιχειρείν & μάρκετινγκ : καινοτόμα μοντέλα σε ψηφιακό περιβάλλον. [Αθήνα] : Rosili, 2014.
Δουκίδης, Γεώργιος Ι. Καινοτομία, στρατηγική, ανάπτυξη και πληροφοριακά συστήματα. Αθήνα : Ι. Σιδέρης, 2011.
Armstrong, Gary M.; Kotler, Philip; Βλαχοπούλου, Μάρω. Εισαγωγή στο μάρκετινγκ. Θεσσαλονίκη : Επίκεντρο, 2009.
Βλαχοπούλου, Μάρω. E-Marketing, διαδικτυακό μάρκετινγκ. Γέρακας [Αθήνα] : Rosili, c2003.

Additional material

Instructor's website
(Students will access literature references and all other course materials online)

MULTIMEDIA TECHNOLOGIES AND COMMUNICATIONS (ΠΛ0520)

Coordinator: **Manitsaris Athanasios**
Semester: 5th (Winter) | **Orientation:** AI | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Manitsaris Athanassios*

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):

Ξυλωμένος, Γεώργιος Β; Πολύζος, Γεώργιος Κ. Τεχνολογία πολυμέσων και πολυμεσικές επικοινωνίες. Αθήνα : Κλειδάριθμος, c2009.
Δημητριάδης, Σταύρος Ν; Πομπόρτσης, Ανδρέας Σ; Τριανταφύλλου, Ευάγγελος Γ. Τεχνολογία πολυμέσων : θεωρία και πράξη. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2004.
Steinmetz, Ralf; Nahrstedt, Klara. Πολυμέσα : θεωρία και πράξη. Αθήνα : Μ. Γκιούρδας, 2002.

Additional material

Slides

E-COMMERCE TECHNOLOGY (ΠΛ0521)

Coordinator: **Georgiadis Christos**
Semester: 5th (Winter) | **Orientation:** AI | *Compulsory* | **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):
Laudon, Kenneth C; Traver, Carol Guercio; Γκαντζιάς, Γιώργος Κ. Ηλεκτρονικό εμπόριο 2014 : επιχειρήσεις, τεχνολογία, κοινωνία. 10η Έκδοση. Αθήνα : Παπασωτηρίου, 2014
Καρανικόλας, Νικήτας Ν. Τεχνολογίες διαδικτύου και ηλεκτρονικό εμπόριο : θεωρητική και πρακτική προσέγγιση. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, 2006.
Ince, Darrel; Μαργαρίτης, Κωνσταντίνος Γ. Κατανεμημένες εφαρμογές και ηλεκτρονικό εμπόριο. Θεσσαλονίκη : Εκδόσεις Πανεπιστημίου Μακεδονίας, c2007.

Additional material

Instructor's notes and slides.
Instructor's website.

BUSINESS POLICY AND STRATEGY (ΔΤ3301)

Coordinator: **Kitsios Fotios**
Semester: 5th (Winter) | **Orientation:** TM | *Compulsory* | **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):
Παπαδάκης, Βασίλης Μ. Στρατηγική των επιχειρήσεων : ελληνική και διεθνής εμπειρία. 6η Έκδοση. Αθήνα : Εκδόσεις Ε. Μπένου, 2012.
Johnson, Gerry; Scholes, Kevan; Whittington, Richard. Βασικές αρχές στρατηγικής των επιχειρήσεων. Αθήνα : Κριτική, 2011.
Thompson, Arthur A; Strickland, A. J. (Alonzo J.); Gamble, John (John E.). Σχεδιασμός & υλοποίηση επιχειρησιακής στρατηγικής : η αναζήτηση ανταγωνιστικού πλεονεκτήματος. Αθήνα : Utopia, c2010.
Μιχαλόπουλος, Μιχάλης; Γρηγορούδης, Βαγγέλης; Ζοπουνίδης, Κωνσταντίνος. Στρατηγική των επιχειρήσεων. Αθήνα : Κλειδάριθμος, c2007.
Σιώμκος, Ι. Γιώργιος. Στρατηγικό μάρκετινγκ. Λιβάνη 2015.
Θερίου, Νικόλαος. Στρατηγική διοίκηση επιχειρήσεων. 3η Έκδοση. Αθήνα : Κριτική, 2014.
Παπαδάκης, Βασίλης Μ. Στρατηγική των επιχειρήσεων : ελληνική και διεθνής εμπειρία. 4η Έκδοση. Αθήνα : Εκδόσεις Ε. Μπένου, 2011.

Additional material

DESIGN AND PRODUCTION TECHNOLOGIES (ΔΤ3502)

Coordinator: **Vergidis Konstantinos**
Semester: 5th (Winter) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Vergidis Konstantinos*

General Competences

Product design and development cycle. Key principles for designing and manufacturing a product. Concepts of CAD, CAM, CIM, and CAE technologies. CAD (Computer Aided Design) tools for design studies, product concepts, reverse design, modelling, designing, simulation, computer-aided engineering tools (CAE). Edge models, surface models, solid models, solid models and parametric design, modelling examples. CAM tools for manufacturing a product. Workshop exercises in CAD, CAM, and CAE programs. New trends in Product Design and Manufacture Systems.

Course Content

Assessment

Written final examination 50%
2 (two) midterm tests 50% (2*25%)

Course Bibliography

(One of the following):
Μπιλάλης, Νικόλαος; Μαραβελάκης, Εμμανουήλ. Συστήματα CAD/CAM και τρισδιάστατη μοντελοποίηση. 2η Έκδοση. Αθήνα : Κριτική, 2014.
Lee, Kunwoo. Βασικές αρχές συστημάτων CAD/CAM/CAE. Αθήνα : Κλειδάριθμος, c2009.

Additional material

DISTRIBUTED SYSTEMS (ΔΤ3601)

Coordinator: **Margaritis Konstantinos**
Semester: 5th (Winter) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Margaritis Konstantinos*

General Competences
Introduction to Distributed Systems. E-commerce applications. Ports and sockets. Java network programming. Middleware. File, name , catalogue, timing, and duplication services. Transaction, synchronisation check, and security services. Message exchange/passing: protocols, synchronicity and asynchronicity. Distributed objects technology. Event-driven bus architectures. Remote procedure call. The constellation architecture. Distributed Databases: data distribution types and problems. XML utilisation. Developing object-oriented remote systems. The RMI architecture. CORBA services, interface definition languages. Internet security issues: attack types, encryption, digital signatures, authentication.

Course Content

Assessment
Written final examination 70%
coursework 30%

Course Bibliography
(One of the following):
Κάβουρας, Ι. Κ.; Μήλης, Ι.Ζ.; Ρουκουνάκη, Α.Α. Κατανεμημένα Συστήματα με Java. 3η Έκδοση. Αθήνα: Κλειδάριθμος, 2011.
Tanenbaum, Andrew S; Steen, Maarten van. Κατανεμημένα συστήματα : αρχές και υποδείγματα. Αθήνα : Κλειδάριθμος, 2006.
Ince, D. (Darrel); Μαργαρίτης, Κ. Γ. (Κωνσταντίνος Γ.). Κατανεμημένες εφαρμογές και ηλεκτρονικό εμπόριο. Θεσσαλονίκη: Εκδόσεις Πανεπιστημίου Μακεδονίας, c2007.

Additional material
Instructor's website

ECONOMETRICS I (ΠΛ0504)

Coordinator: **Dritsakis Nikolaos**
Semester: 5th (Winter) | **Orientation:** TM | *Compulsory* | **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%
coursework and a midterm test 20%

Course Bibliography

(One of the following):
Δριτσάκη, Χάϊδω Ν; Δριτσάκη, Μελίνα Ν. Εισαγωγή στην οικονομετρία : με τη χρήση του λογισμικού Eviews. Αθήνα : Κλειδάριθμος, c2013.
Τζαβαλής, Ηλίας. Οικονομετρία. Αθήνα : Εκδόσεις ΟΠΑ, 2008.

Additional material

INFORMATION SYSTEMS ANALYSIS AND DESIGN (ΔΤ3501)

Coordinator: **Tambouris Efthimios**
Semester: 5th (Winter) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Tambouris Efthimios*

General Competences

Life cycle software development models (waterfall model, phased model, prototype etc), requirement specification, object-oriented analysis and software design using UML language (use case diagrams, activity diagrams, class diagrams, deployment diagrams etc).

Course Content

Assessment

Written final examination 70%
coursework 30%

Course Bibliography

(One of the following):

Dennis, Alan; Wixom, Barbara Haley; Tegarden, David Paul. Ανάλυση και σχεδιασμός συστημάτων με τη UML 2.0 : μια αντικειμενοστρεφής προσέγγιση. 3η Έκδοση. Αθήνα : Κλειδάριθμος, c2010.
Γερογιάννης, Βασίλης Χ; Φιτσιλής, Πάνος. Αντικειμενοστρεφής ανάπτυξη λογισμικού με τη UML. Αθήνα : Κλειδάριθμος, c2006.

Additional material

NETWORK AND INTERNET APPLICATIONS SECURITY (ΠΛ0825)

Coordinator: **Mavridis Ioannis**
Semester: 5th (Winter) | **Orientation:** TM | *Compulsory* | **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 100%
Optional coursework up to 30%

Course Bibliography

(One of the following):
Πάγκαλος, Γεώργιος; Μαυρίδης, Ι. (Ιωάννης). Ασφάλεια πληροφοριακών συστημάτων και δικτύων. Θεσσαλονίκη : Ανικούλα, c2002.
Γκρίτζαλης, Στέφανος; Κάτσικας, Σωκράτης Κ; Γκρίτζαλης, Δημήτρης. Ασφάλεια δικτύων υπολογιστών : τεχνολογίες και υπηρεσίες σε περιβάλλοντα ηλεκτρονικού επιχειρείν και ηλεκτρονικής διακυβέρνησης. Αθήνα : Παπασωτηρίου, 2003.

Additional material

Instructor's notes and slides

6th Semester

ARTIFICIAL INTELLIGENCE (ΠΛ0701)

Coordinator: **Refanidis Ioannis**
Semester: 6th (Spring) | **Orientation:** AI | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Refanidis Ioannis, Sakellariou Ilias*

General Competences

To be able to: (a) model search problems and use suitable search algorithms to solve them; (b) represent knowledge and reason over it; (c) model and solve planning problems.

Course Content

Intelligent agents.
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. Resolution. Ontologies. Semantic web.
Planning. STRIPS representation. Progression and Regression. Partial order planning. Temporal planning and planning with resources.

Assessment

Written examination 80%
Optional coursework 20%

Course Bibliography

(One of the following):
Russell, Stuart J. (Stuart Jonathan); Norvig, Peter; Canny, John. Τεχνητή νοημοσύνη : μια σύγχρονη προσέγγιση. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, 2005.
Βλαχάβας, Ιωάννης Π. Τεχνητή νοημοσύνη. Θεσσαλονίκη : Εκδόσεις Πανεπιστημίου Μακεδονίας, 2011.

Additional material

Instructor's notes and slides

DECISION SUPPORT SYSTEMS (ΠΛ0805-1)

Coordinator: **Hristou - Varsakelis Dimitrios**
Semester: 6th (Spring) | **Orientation:** AI | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Hristou - Varsakelis Dimitrios*

General Competences

The course aims to a) expose the basic features of a decision support system (DSS) and b) show students how to formulate small-scale decision support models that could serve as the "core" of a DSS. We will discuss various techniques and tools from applied mathematics and optimization in order to solve a series of practical decision problems.

Course Content

Introduction to Decision Support Systems (DSS) – structure of DSS
Introduction to Decision Theory
Decision Trees
Utility theory
Multicriteria Decision-making
Introduction to discrete-time dynamical systems
Markov-based models
Dynamic Programming

Assessment

Written final examination 70%
coursework 30%

Course Bibliography

(One of the following):
Hillier, Frederick S; Lieberman, Gerald J. Introduction to operations research. Boston: McGraw-Hill Higher Education, c2005.
Φράγκος, Χρήστος Κ. Εισαγωγή στην επιχειρησιακή έρευνα : λήψη αποφάσεων με εφαρμογή μαθηματικών μοντέλων. Αθήνα : Σταμούλης, c2006.
Πραστάκος, Γρηγόρης. Διοικητική επιστήμη : λήψη επιχειρησιακών αποφάσεων στην κοινωνία της πληροφορίας. Αθήνα : Σταμούλης, c2003.

Additional material

Instructor's notes

ECONOMETRICS II (ΠΛ0709)

Coordinator: **Dritsakis Nikolaos**
Semester: 6th (Spring) | **Orientation:** AI | *Compulsory* | **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):
Βάμβουκας, Γιώργος Α. Σύγχρονη οικονομετρία : ανάλυση και εφαρμογές. Αθήνα : Εκδόσεις Οικονομικού Πανεπιστημίου Αθηνών, 2007.
Χάλκος, Γεώργιος Εμμ. Οικονομετρία. Αθήνα : Gutenberg, c2011.

Additional material

INFORMATION AND SYSTEMS SECURITY (ΠΛ0713-2)

Coordinator: **Mavridis Ioannis**
Semester: 6th (Spring) | **Orientation:** AI | *Compulsory* | **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 100%
Optional coursework 30%

Course Bibliography

(One of the following):
Πάγκαλος, Γεώργιος; Μαυρίδης, Ι. (Ιωάννης). Ασφάλεια πληροφοριακών συστημάτων και δικτύων .Θεσσαλονίκη : Ανικούλα, c2002
Κάτσικας, Σωκράτης Κ; Γκρίτζαλης, Δημήτρης; Γκρίτζαλης, Στέφανος. Ασφάλεια πληροφοριακών συστημάτων. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, c2004.

Additional material

Instructor's notes and slides

INFORMATION TECHNOLOGY LAW (IT LAW) (ΠΛ0617)

Coordinator: **Alexandropoulou Evgenia**
Semester: 6th (Spring) | **Orientation:** AI | *Compulsory* | **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.
Content

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 examination 100%

Course Bibliography

(One of the following):
Χριστοδούλου, Κωνσταντίνος Ν. Δίκαιο προσωπικών δεδομένων. Αθήνα : Νομική Βιβλιοθήκη, [2013].
Ιγγλεζάκης, Ιωάννης Δ. Ευαίσθητα προσωπικά δεδομένα : η επεξεργασία ειδικών κατηγοριών προσωπικών δεδομένων και οι συνέπειές της. Αθήνα ; Θεσσαλονίκη : Σάκκουλας, 2003.

Additional material

EMBEDDED SYSTEMS (ΔΤ3602)

Coordinator: **Kaskalis Theodoros**
Semester: 6th (Spring) | **Orientation:** TM | *Compulsory*| **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):
Ashenden, Peter J; Ψαράκης, Μ. (Μιχαήλ); Κρανίτης, Ν. (Νεκτάριος); Γκιζόπουλος, Δημήτρης. Ψηφιακή σχεδίαση : ενσωματωμένα συστήματα με VHDL. Εκδόσεις Νέων Τεχνολογιών, c2010.
Wolf, Wayne; Βώρος, Νικόλαος Σπ; Κριθαρίδης, Δημήτρης Σ; Μασσέλος, Κωνσταντίνος Γ. Οι υπολογιστές ως συστατικά στοιχεία : αρχές σχεδίασης ενσωματωμένων υπολογιστικών συστημάτων. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, c2008.

Additional material

ENTERPRISE ARCHITECTURES (ΔΤ3503)

Coordinator: **Vergidis Konstantinos**
Semester: 6th (Spring) | **Orientation:** TM | *Compulsory* | **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):

Παναγιώτου, Νικόλαος Α. Διαχείριση επιχειρησιακών διαδικασιών : οργάνωση, αναδιοργάνωση και βελτίωση. Αθήνα : Κλειδάριθμος, 2013.
Κακούρης, Ανδρέας Π. Διοίκηση επιχειρησιακών λειτουργιών = Operations management. Αθήνα : Προπομπός, 2013.

Additional material

MOBILE AND WIRELESS COMMUNICATIONS SYSTEMS (ΔΤ3702)

Coordinator: **Psannis Konstantinos**
Semester: 6th (Spring) | **Orientation:** TM | *Compulsory*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Psannis Konstantinos, Petridou Sofia*

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

Course Bibliography

(One of the following):

Θεολόγου, Μιχαήλ Ε. Δίκτυα κινητών και προσωπικών επικοινωνιών. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2010.
Stallings, William. Ασύρματες επικοινωνίες και δίκτυα. Θεσσαλονίκη : Τζιόλας, c2007.

Additional material

QUALITY ASSURANCE AND QUALITY CONTROL TECHNIQUES (ΔΤ3302)

Coordinator: **Nikolaidis Ioannis**
Semester: 6th (Spring) | **Orientation:** TM | *Compulsory* | **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 students are presented with some simple and other more developed quality control techniques for products or processes, which can be applied in any type of factory. 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

Written final examination 70%
Coursework 30%

Course Bibliography

(One of the following):
Ταγαράς, Γιώργος Ν. Στατιστικός έλεγχος ποιότητας. Θεσσαλονίκη : Εκδόσεις Ζήτη, 2001.
Παπαργύρης, Αθανάσιος; Παπαργύρης, Δημήτριος. Ποιοτικός έλεγχος παραγωγής . Θεσσαλονίκη : Εκδόσεις Ζήτη, c2010.

Additional material

SUPPLY CHAIN MANAGEMENT (ΔΤ3303)

Coordinator: **Madas Michael**
Semester: 6th (Spring) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Mantas 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

Written final examination 50%
Coursework 50%

Course Bibliography

(One of the following):
Chopra, Sunil; Meindl, Peter. Διοίκηση εφοδιαστικής αλυσίδας : στρατηγική, προγραμματισμός και λειτουργία. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2014.
Βιδάλης, Μιχάλης. Εφοδιαστική (logistics) : μια ποσοτική προσέγγιση . Αθήνα : Κλειδάριθμος, c2009.
Harrison, Alan; Hoek, Remko I. van; Γιαννακόπουλος, Διονύσης; Μοσχούρης, Σωκράτης. Logistics μάνατζμεντ & στρατηγική : ανταγωνιστικό πλεονέκτημα μέσω της αλυσίδας εφοδιασμού. [Αθήνα] : Rosili, c2013.

Additional material

SYSTEMS DEVELOPMENT TECHNOLOGY (ΔΤ3504)

Coordinator: **Vergidis Konstantinos**
Semester: 6th (Spring) | **Orientation:** TM | *Compulsory* | **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):
Γιακουμάκης, Εμμ. Α; Διαμαντίδης, Νικόλαος Α. Τεχνολογία λογισμικού. Αθήνα : Αθ. Σταμούλης, c2009.
Sommerville, Ian. Βασικές αρχές τεχνολογίας λογισμικού . Αθήνα : Κλειδάριθμος, c2009.

Additional material

7th Semester

BUSINESS INNOVATION AND PRODUCTIVITY (ΠΛ0611-3)

Coordinator: **Vlachopoulou Maro**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **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):

Δουκίδης, Γεώργιος Ι. Καινοτομία, στρατηγική, ανάπτυξη και πληροφοριακά συστήματα. Αθήνα : Ι. Σιδέρης, 2011.
White, Margaret A. (Margaret Alice); Bruton, Garry D; Καλογήρου, Γιάννης; Πρωτόγερου, Αιμιλία; Κωνσταντέλου, Αναστασία. Η στρατηγική διαχείριση της τεχνολογίας και της καινοτομίας. Αθήνα : Κριτική, 2010.
Σαλαβού, Ελένη Ε. Καινοτομία και αλλαγή στο "επιχειρείν". [Αθήνα] : Rosili, 2013.

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

COMPUTATION THEORY AND AUTOMATA (ΠΛ0506-1)

Coordinator: **Refanidis Ioannis**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **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.ContentAlphabets 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.

Course Content

Assessment

Final examination 100%.
Optional coursework up to 30%

Course Bibliography

(One of the following):

Lewis, Harry R; Papadimitriou, Christos H; Σιδέρη, Μάρθα. Στοιχεία θεωρίας υπολογισμού. Αθήνα : Εκδόσεις Κριτική, 2005.
Sipser, Michael. Εισαγωγή στη θεωρία υπολογισμού. Ηράκλειο : Πανεπιστημιακές Εκδόσεις Κρήτης, c2007.

Additional material

CRYPTOGRAPHY (ΠΛ0618)

Coordinator: **Stephanides George**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Stephanides George*

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):
Κάτος, Βασίλειος Αν; Στεφανίδης, Γεώργιος Χρ. Τεχνικές κρυπτογραφίας & κρυπτανάλυσης. Θεσσαλονίκη : Ζυγός, 2003.
Πουλάκης, Δημήτριος Μ. Κρυπτογραφία : η επιστήμη της ασφαλούς επικοινωνίας. Θεσσαλονίκη : Εκδόσεις Ζήτη, 2006, c2009.

Additional material

EDUCATIONAL PROGRAMMING ENVIRONMENTS AND LANGUAGES (ΠΛ0726)

Coordinator: **Satratzemi Maria**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Satratzemi Maria*

General Competences

The aim of the course is to present the necessity for the development of systems and methodologies for the support of learning and teaching of programming, and particularly the two prevailing programming examples: procedural and object-oriented.ContentSynopsis of difficulties, errors and erroneous perceptions/misapprehensions of students in introductory programming courses. Instructive situations to overcome the difficulties of novice programmers. Classification of various approaches of teaching programming and the educational tools that have been developed in the frame of each approach. Educational programming environments and micro-languages: Bluej, DrJava, JEROO, JGRASP, Karel the Robot, objectkarel, Alice, scratch- a programming language for all.Educational robotics, LegoMindstorms and programming language and environments

Course Content

Assessment

An Essay (a literature review and empirical research paper).
A Case study (presentation and writing)

Course Bibliography

Σατρατζέμη, Μαρία. Εκπαιδευτικά Προγραμματιστικά Περιβάλλοντα και Γλώσσες. Σημειώσεις.
Σατρατζέμη, Μαρία. Αντικειμενοστραφής Προγραμματισμός: Διδακτικά Προβλήματα και Εκπαιδευτικά Προγραμματιστικά Περιβάλλοντα. Θεσσαλονίκη: Εκδόσεις ΣΟΦΙΑ, 2008.
Rennedsen, Jen; Caspersen, Michael; Kolling, Michael. Reflections on the Teaching of Programming, methods and implementations. Springer-Verlag, LNVS 4821, 2008.

Additional material

GAME THEORY (ΠΛ0722)

Coordinator: **Refanidis Ioannis**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **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.ContentGame 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.

Course Content

Assessment

Written final examination 100%
Optional coursework up to 30%

Course Bibliography

(One of the following):
Osborne, Martin J. Εισαγωγή στη θεωρία παιγνίων. Αθήνα : Κλειδάριθμος, c2010.
Βαρουφάκης, Γιάννης. Θεωρία παιγνίων : η θεωρία που φιλοδοξεί να ενοποιήσει τις κοινωνικές επιστήμες. Αθήνα : Gutenberg, 2007.

Additional material

Instructor's notes and slides

INTERNATIONAL ECONOMICS (ΠΛ0309-2)

Coordinator: **Katsouli-Katou Helen**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Katsouli-Katou Helen*

General Competences
Upon completion of this course, students should be able to:(a) Understand the basic principles of International Economics(b) Identify the main theories of International Economics(c) Apply the methodologies of International Economics on real cases(d) Use the tools of International Economics in decision - makingContent- International economic exchange (theories and empirical foundations of international trade and factor movements, public barriers to trade and protection, developing the institutional framework of international trade, international enterprises)- Trade and developing countries- International monetary relationships (currency market, determination of exchange rate, balance of payments, adjustment mechanisms of the balance of payments, international monetary system)- Current international economic problems

Course Content

Assessment
Written final examination 100%
Optional coursework

Course Bibliography
(One of the following):
Πουρναράκης, Ευθύμιος Δ. Διεθνής οικονομική : μια εισαγωγική προσέγγιση. Αθήνα : [χ.ό.], 2010.
Αγιομυργιανάκης, Γ. Μ. (Γιώργος Μ.); Vlassis, Minas; Thompson, Henry. Διεθνείς οικονομικές σχέσεις : διεθνές εμπόριο. Αθήνα : Rosili, c2006.

Additional material

INTERNET LAW (ΠΛ0725)

Coordinator: Alexandropoulou Evgenia
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Alexandropoulou Evgenia*

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.ContentThe 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.

Course Content

Assessment

Written final examination.
Optional coursework.

Course Bibliography

(One of the following):
Σιδηρόπουλος, Θεόδωρος Κ. Το δίκαιο του διαδικτύου. Εκδόσεις Σάκκουλα, 2008.
Καράκωστας, Ιωάννης Κ; Κιούπης, Δ. (Δημήτρης). Δίκαιο & Internet : νομικά ζητήματα του διαδικτύου. Αθήνα : Π.Ν. Σάκκουλας, 2009.

Additional material

LOGISTICS INFORMATION SYSTEMS (ΠΛ0819)

Coordinator: **Madas Michael**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Mantas 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

Written final examination 100%
Optional coursework up to 30%

Course Bibliography

(One of the following):
Chopra, Sunil; Meindl, Peter. Διοίκηση εφοδιαστικής αλυσίδας : στρατηγική, προγραμματισμός και λειτουργία. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2015.
Βιδάλης, Μιχάλης. Εφοδιαστική (logistics) : μια ποσοτική προσέγγιση. Αθήνα : Κλειδάριθμος, c2009.
Μαρινάκης, Ιωάννης; Μυγδαλάς, Αθανάσιος. Σχεδιασμός και βελτιστοποίηση της εφοδιαστικής αλυσίδας. Θεσσαλονίκη : Εκδόσεις Σοφία, c2012.

Additional material

NETWORKS AND INTERNET APPLICATIONS SECURITY (ΠΛ0825)

Coordinator: **Mavridis Ioannis**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **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 and
Optional coursework

Course Bibliography

(One of the following):

Πάγκαλος, Γεώργιος; Μαυρίδης, Ι. (Ιωάννης). Ασφάλεια πληροφοριακών συστημάτων και δικτύων. Θεσσαλονίκη : Ανίκουλας, c2002.
Γκρίτζαλης, Στέφανος; Κάτσικας, Σωκράτης Κ; Γκρίτζαλης, Δημήτρης. Ασφάλεια δικτύων υπολογιστών : τεχνολογίες και υπηρεσίες σε περιβάλλοντα ηλεκτρονικού επιχειρείν και ηλεκτρονικής διακυβέρνησης. Αθήνα : Παπασωτηρίου, 2003.

Additional material

OPERATIONS RESEARCH (ΠΛ0814-1)

Coordinator: **Hristou - Varsakelis Dimitrios**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Hristou - Varsakelis Dimitrios*

General Competences

To (a) understand some of the fundamental principles and theory which concern important classes of optimization problems, and (b) gain the ability to formulate and solve optimization problems using analytical and computational techniques.

Course Content

Linear vector spacesOptimizing functions of a vector variableOptimization with equality constraints - Langrange multipliersOptimization with inequality constraints - Karush-Kuhn-Tucker theoremInteger programming - Branch & Bound methodComputational OptimizationDiscrete-time dynamical systems - Dynamic Programming

Assessment

Midterm tests 30%
Written final examination 70%

Course Bibliography

(One of the following):
Hillier, Frederick S; Lieberman, Gerald J. Introduction to operations research. McGraw-Hill Higher Education, c2005.
Bronson, Richard; Naadimuthu, Govindasami. Επιχειρησιακή έρευνα : θεωρία και προβλήματα. Αθήνα : Κλειδάριθμος, c2010.
Φακίνος, Δημήτρης; Οικονόμου, Αντώνης. Εισαγωγή στην επιχειρησιακή έρευνα : θεωρία και ασκήσεις. Αθήνα : Συμμετρία, 2003.

Additional material

PARALLEL PROCESSING (ΠΛ0705-1)

Coordinator: **Margaritis Konstantinos**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Margaritis Konstantinos*

General Competences
Students must be able to: a) design simple parallel algorithms and transform them to programs using a parallel programming language b) use parallel programming environments, debugging and performance evaluation methods. c) understand the differences and similarities of the two basic parallel programming models, that is shared and distributed memory architectures. Progarmming in OpenMP and MPI, using Eclipse PTP for visualization and performance evaluation.Content

Course Content

Assessment
Midterm tests 50%
Courswork and oral examination 50%

Course Bibliography
(One of the following):
Kirk, David; Hwu, Wen-mei. Προγραμματισμός μαζικά παράλληλων επεξεργαστών. Αθήνα : Κλειδάριθμος, c2010.
Μάργαρης, Αθανάσιος Ι. MPI θεωρία & εφαρμογές. Θεσσαλονίκη : Τζιόλας, c2008.
Πάντζιου, Γραμματή; Μάμαλης, Βασίλειος; Τομαράς, Αλέξανδρος Χρ. Εισαγωγή στον Παράλληλο Υπολογισμό. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, c2003.

Additional material

SPECIAL SUBJECTS IN ACCOUNTING (ΠΛ0510)

Coordinator: **Vazakidis Athanasios**
Semester: 7th (Winter) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Vazakidis Athanasios, Stavropoulos Antonios*

General Competences

This course is aiming to: ? Enable students familiar with the essentials of the Value Added Tax (VAT), listing - intrastat. ? Enable students aware of labour relationships in Greece with references on topics such as industrials, payroll, and insurance.? Enable students capable of posting entries in accounting books (first, second and third class of categorization), and at the same time aware in relation to the composition of the periodical and annual VAT statements. ? Enable students aware of real situations related to the termination of contracts (relationship between employees and employers), and VAT.ContentThis course examines the application of the Value Added Tax (VAT) to companies belonged to one of the three classes of books keeping in Greece accordingly with Greek general accepted accounting principles. In this framework the tax treatment of companies with a significant magnitude of entrepreneurial transactions, imports and exports inside and outside the European community is also analyzed. Additionally, issues related to the Greek law of labor such as recruitment, payroll, leave, holiday with pay, bonus of Christmas and Easter, maternity leave and redundancy pay are attributed. The lectures of this course combine theoretical examples and case studies which are solving using hand written and the use of software.

Course Content

Assessment

Written final examination 100%
Optional coursework up to 30%

Course Bibliography

(One of the following):
Καραγιάννης, Ιωάννης Δ; Καραγιάννη, Αικατερίνη Δ; Καραγιάννης, Δημήτρης Ι. Εργατικά, μισθοδοσίες, ασφαλιστικά : παραδείγματα-δηλώσεις : στην πράξη. Θεσσαλονίκη : [χ.ό.], 2014.
Καρακιουλάφη, Χριστίνα. Εργασιακές σχέσεις : θεωρητικές προσεγγίσεις και εμπειρικά ζητήματα . Αθήνα : Εκδόσεις Παπαζήση, 2012.

Additional material

ADVANCED INFORMATION SYSTEMS (ΔΤ4504)

Coordinator: **Tambouris Efthimios**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Tambouris Efthimios*

General Competences

In this course advanced technologies and applications are presented along with their influence in modern organizations. Lecturing is based on understanding state-of-the-art technologies along with their adoption by modern organizations as well as investigating relevant organizational change from this adoption. The technologies under investigation will be based on current technological progress and may include amongst others Web 2.0, Web 3.0, Semantic Web etc. Workshops will be based on relevant open source platforms and case studies.

Course Content

Assessment

Written final examination 50%
Coursework 50%

Course Bibliography

(One of the following):
Βακάλη, Αθηνά; Παπαμήτσιου, Ζαχαρούλα. Πληροφοριακά Συστήματα Παγκόσμιου Ιστού. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, 2012.
Avison, D. E; Fitzgerald, G. (Guy); Βώρος, Νικόλαος Σπ. Προηγμένα πληροφοριακά συστήματα : από τη θεωρία στην πράξη. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, c2006.

Additional material

BUSINESS MODELLING (ΔΤ4502)

Coordinator: **Vergidis Konstantinos**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **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):
Παναγιώτου, Νικόλαος Α. Διαχείριση επιχειρησιακών διαδικασιών : οργάνωση, αναδιοργάνωση και βελτίωση. Αθήνα : Κλειδάριθμος, 2013.
Γιαγλής, Γεώργιος Μ; Καραγιαννάκη, Αγγελική. Ποσοτική και ποιοτική μοντελοποίηση επιχειρηματικών διαδικασιών . Αθήνα : Εκδόσεις ΟΠΑ, c2012.

Additional material

COMBINATORIAL OPTIMIZATION (ΔΤ4302)

Coordinator: **Sifaleras Angelo**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *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):
Παπαρρίζος, Κωνσταντίνος; Σαμαράς, Νικόλαος; Σιφαλέρας, Άγγελος. Δικτυακή βελτιστοποίηση. Θεσσαλονίκη : Ζυγός, 2009.
Μηλιώτης, Παναγιώτης Α; Μούρτος, Ιωάννης. Διακριτή βελτιστοποίηση. Αθήνα : Εκδόσεις ΟΠΑ, c2012.
Βασιλείου, Π.-Χ. Γ. (Παναγιώτης-Χρήστος Γ.). Εφαρμοσμένος μαθηματικός προγραμματισμός. Θεσσαλονίκη : Ζήτη, 2001.

Additional material

COMPUTERIZED ACCOUNTING (ΠΛ0803)

Coordinator: **Vazakidis Athanasios**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **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):
Βαζακίδης, Αθανάσιος Π; Σταυρόπουλος, Αντώνιος Α; Χατζής, Αναστάσιος. Λογιστικό σχέδιο, μηχανογράφηση λογιστηρίου. Θεσσαλονίκη : [χ.ό.], 2010.
Γκίνογλου, Δημήτρης; Ταχυνάκης, Παναγιώτης; Πρωτόγερος, Νικόλαος. Λογιστικά πληροφοριακά συστήματα : μηχανογραφημένη λογιστική. Γέρακας : Rosili, c2004.

Additional material

CONVERGENCE OF COMMUNICATION SYSTEMS (ΔΤ4702)

Coordinator: **Psannis Konstantinos**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Psannis Konstantinos*

General Competences

Students are familiarized with the communication systems convergence: telecommunications and mass media convergence, the convergence of communications networks and value-added services, convergence of information and communication technologies, next-generation access networks convergence, the convergence of business models and high-speed networks, the challenges for enterprises in convergence of communication systems, TV-Computers-Networks convergence. Furthermore the new regulatory challenges, the pricing of new services, the impact of the new regulatory framework of the EU to the new network infrastructure and services, the effects on consumers, several examples of beneficial use of next-generation access networks, the impact of communication systems convergence in corporate strategy and governance systems will be presented in details. In the laboratory we will develop dynamic programming algorithms for efficient data transmission in convergent telecommunications systems. Also during the theoretical course special emphasis will be given in R&D projects in the area of communications systems convergence.

Course Content

Assessment

Written final examination 60%
Compulsory assignment/lab tests 40%

Course Bibliography

(One of the following):
Βασιλόπουλος, Χρήστος. Δίκτυα πρόσβασης νέας γενιάς. Αθήνα : Κλειδάριθμος, c2010.
Haykin, Simon S; Moher, Michael. Συστήματα επικοινωνίας. Αθήνα : Παπασωτηρίου, 2010.

Additional material

DECISION MAKING MODELS (ΔΤ4303)

Coordinator: **Sifaleras Angelo**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Sifaleras Angelo*

General Competences
Introduction to problem solving and decision making in complex business problems, through the methodology of management science. The understanding of the decision models under risk and uncertainty, and their applications in technology management – case studies. Decision theory & criteria, expected value of perfect information, utility theory, decision trees & sensitivity analysis, introduction to game theory, performance measurement using data envelopment analysis (DEA). The student, apart from the methodology in each section, will learn how to use state-of-the-art software packages (e.g., Palisade DecisionTools Suite, DEA Solver).

Course Content

Assessment
Written final examination

Course Bibliography
(One of the following):
Καρασαββίδου-Χατζηγρηγορίου, Ελεονώρα.. Λήψη επιχειρηματικών αποφάσεων : προσέγγιση με την επιχειρησιακή έρευνα. Θεσσαλονίκη : University Studio Press, 1986.
Golub, Andrew Lang; Μητρόπουλος, Ιωάννης. Ορθολογική λήψη αποφάσεων : μια ολοκληρωμένη προσέγγιση. Πάτρα : Gotsis, 2007.
Μηλολιδάκης, Κωστής. Θεωρία παιγνίων : μαθηματικά μοντέλα σύγκρουσης και συνεργασίας. Θεσσαλονίκη : Εκδόσεις Σοφία, c2009.

Additional material

DIGITAL MEDIA COMMUNICATION SYSTEMS (ΠΛ0731)

Coordinator: **Psannis Konstantinos**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Psannis Konstantinos*

General Competences

Course Content

Assessment
Written final examination 60%
Compulsory assignment/lab tests 40%

Course Bibliography
(One of the following):
Ξυλωμένος, Γεώργιος Β; Πολύζος, Γεώργιος Κ. Τεχνολογία πολυμέσων και πολυμεσικές επικοινωνίες. Αθήνα : Κλειδάριθμος, c2009.
Proakis, G. John. Ψηφιακή ανάλυση σήματος: αρχές, αλγόριθμοι, εφαρμογές. Ίων 2010.

Additional material

DIGITAL SYSTEMS' DESIGN AND PROGRAMMING (ΔΤ4601)

Coordinator: **Kaskalis Theodoros**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **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):

Πεκμεστζή, Κ. (Κιαμάλ). Συστήματα μικροϋπολογιστών. Αθήνα : Συμμετρία, 2009.
Χατζηγκάιδας, Αθανάσιος Θ; Κουτσινού, Μαρία. Ηλεκτρονική σχεδίαση-κατασκευή & προσομοίωση τυπωμένων κυκλωμάτων. Τρίλοφος, Θεσσαλονίκη : Εκδόσεις Grapholine, c2011.

Additional material

ENTREPRENEURSHIP AND TECHNOLOGY INNOVATION (ΔΤ4404)

Coordinator: **Fouskas Konstantinos**
Semester: 7th (Winter) | **Orientation:** TM | *Compulsory* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Fouskas Konstantinos*

General Competences

During this course we will examine the concepts of entrepreneurship and innovation, focusing on their technological dimension. We will analyze the business process from conception to finding financial resources and launch of a start-up. It will also examine the concepts, procedures and practices of innovation, management modes and methods of assessment.
The presentations will be accompanied by actual case studies from both Greek and international business environment, while, speakers from leading companies and organizations with relevant experience will be invited.
The purpose of this course is to introduce students to the concept of entrepreneurship and innovation, they can develop innovative thinking and to equip and skills that will help them in their business pursuits.

Course Content

• Introduction to Innovation • Strategy and Technological Innovation • Innovation Management and Practices • Systems and innovation policies • Creativity in the enterprise• Introduction to Entrepreneurship • Business model and business plan • Analysis of competition and targeting,• Development and management of groups and organizations • Financial Analysis and early stages operations

Assessment

Written final examination 60%
Compulsory assignment/lab tests 40%

Course Bibliography

(One of the following):
Σαλαβού, Ελένη Ε. Καινοτομία και αλλαγή στο "επιχειρείν" . [Αθήνα] : Rosili, 2013.
Καραγιάννης, Η. Γ. (Ηλίας Γ.); Μπακούρος, Ιωάννης. Καινοτομία και επιχειρηματικότητα : θεωρία, πράξη. Θεσσαλονίκη : Σοφία, 2010.

Additional material

INNOVATIVE SERVICE AND PRODUCT DEVELOPMENT (ΔΤ4401)

Coordinator: **Kitsios Fotios**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **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):

Κίτσιος, Φώτης Χ; Ζοπουνίδης, Κωνσταντίνος. Ανάπτυξη νέων υπηρεσιών : τουρισμός, υγεία, επιχειρηματικότητα, καινοτομία. Αθήνα : Κλειδάριθμος, c2008.
Αυλωνίτης, Γεώργιος Ι; Παπασταθοπούλου, Πολίνα. Αποτελεσματική διοίκηση χαρτοφυλακίου προϊόντων και υπηρεσιών . Αθήνα : Αθ. Σταμούλης, c2004.
Σιώμκος, Γεώργιος Ι; Τσιάμης, Ιωάννης Σ. Στρατηγικό μάρκετινγκ προϊόντων υψηλής τεχνολογίας. Αθήνα : Εκδόσεις Αθ. Σταμούλης, c2012.
Πραστάκος, Γρηγόρης. Διοικητική επιστήμη : λήψη επιχειρησιακών αποφάσεων στην κοινωνία της πληροφορίας. Αθήνα : Σταμούλης, c2003.

Additional material

INTERNET LAW (ΠΛ0725)

Coordinator: Alexandropoulou Evgenia
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Alexandropoulou Evgenia*

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.ContentThe 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.

Course Content

Assessment

Final examination.
Optional coursework

Course Bibliography

(One of the following):
Σιδηρόπουλος, Θεόδωρος Κ. Το δίκαιο του διαδικτύου. Αθήνα ; Θεσσαλονίκη : Εκδόσεις Σάκκουλα, 2008.
Καράκωστας, Ιωάννης Κ; Κιούπης, Δ. (Δημήτρης). Δίκαιο & Internet : νομικά ζητήματα του διαδικτύου. Αθήνα : Π.Ν. Σάκκουλας, 2009.

Additional material

PARALLEL PROCESSING (ΔΤ4603)

Coordinator: **Margaritis Konstantinos**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Margaritis Konstantinos*

General Competences

Students must be able to: a) design simple parallel algorithms and transform them to programs using a parallel programming language b) use parallel programming environments, debugging and performance evaluation methods. c) understand the differences and similarities of the two basic parallel programming models, that is shared and distributed memory architectures. Progarmming in OpenMP and MPI, using Eclipse PTP for visualization and performance evaluation.Content

Course Content

Introduction to Parallel ProcessingShared and Distributed Memory Parallel Systems Architecture.Data and Functional Parallelism.Data Partinioning.Load Balancing.Process Communication.Synchronous Parallelism.Replicated Workers.Distributed Termination Detaction.

Assessment

Midterm tests 50%
Final coursework and oral examination 50%

Course Bibliography

(One of the following):
Kirk, David; Hwu, Wen-mei. Προγραμματισμός μαζικά παράλληλων επεξεργαστών. Αθήνα : Κλειδάριθμος, c2010.
Μάργαρης, Αθανάσιος Ι. MPI θεωρία & εφαρμογές. Θεσσαλονίκη : Τζιόλας, c2008.
Πάντζιου, Γραμματή; Μάμαλης, Βασίλειος; Τομαράς, Αλέξανδρος Χρ. Εισαγωγή στον Παράλληλο Υπολογισμό. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, c2003.

Additional material

Instructor's notes.
Instructor's website.

SPECIAL CHAPTERS OF APPLIED STATISTICS AND QUALITY CONTROL (ΔΤ4304)

Coordinator: **Nikolaidis Ioannis**
Semester: 7th (Winter) | **Orientation:** TM | *Elective* | **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 a number of special chapters of Statistics, Statistical Quality Control and, in general, Operations Research. This will be done through the use of PCs and simple or advanced software, like Excel and Minitab - Crystal Ball respectively. The students are introduced to this wide research area partly through theory and partly through working on case studies, using PCs. Finally, their knowledge is broadened through analyzing applied case studies.

Course Content

Introduction: discrete and continuous distributions, sampling distributions, central limit theorem, etc.

Assessment

Final examination 80%
Coursework up to 40%

Course Bibliography

(One of the following):
Παπαδήμας, Όθων; Κοίλιας, Χρήστος. Εφαρμοσμένη στατιστική. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, c2002.
Λιώκη-Λειβαδά, Η. (Ηρώ); Ασημακόπουλος, Δ. Ν. (Δημοσθένης Ν.). Μαθήματα εφαρμοσμένης στατιστικής. Αθήνα : Συμμετρία, 2010.

Additional material

8th Semester

COMPUTATIONAL MATHEMATICS (ΠΛ0829)

Coordinator: **Stephanides George**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Stephanides George*

General Competences

Course Content

Assessment
Written Final examination 100%

Course Bibliography
(One of the following):
Στεφανίδης, Γεώργιος Χρ; Σαμαράς, Νικόλαος. Υπολογιστικές μέθοδοι με το MATLAB. Θεσσαλονίκη : Ζυγός, 1999.
Μισυρλής, Ν. (Νικόλαος). Αριθμητική ανάλυση : μια αλγοριθμική προσέγγιση. Αθήνα : [χ.ό.], 2009.

Additional material
Instructor's Notes and Exercises

COMPUTER NETWORKS DEPLOYMENT AND MANAGEMENT (ΠΛ0610-2)

Coordinator: **Fouliras Panayotis**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **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):
Φουληράς, Παναγιώτης Ε. Δίκτυα υπολογιστών : μια πρακτική προσέγγιση. Θεσσαλονίκη : Ζυγός, 2009.
Comer, Douglas. Δίκτυα και διαδίκτυα υπολογιστών . Αθήνα : Κλειδάριθμος, c2014.

Additional material

CONSTRAINT LOGIC PROGRAMMING (ΠΛ0828)

Coordinator: **Sakellariou Ilias**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **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 differs from the "classical" schools of imperative and object oriented programming. The course aims to (a) introduce to the students logic programming, offering a brief introduction to the theoretical foundations of First Order Predicate Logic and the resolution principle, (b) present in depth Prolog, (c) present the principles of constraint programming and their embedding in the LP platforms, that leads to powerful tools for solving problems, (d) present the applications classes in which LP and CLP offer significant advantages and finally, develop student programming skills, like recursion that are applicable to all programming schools.

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

Course Bibliography

(One of the following):

Μαρακάκης, Μανόλης. Prolog : προγραμματισμός σε λογική για τεχνητή νοημοσύνη. Αθήνα : Εκδόσεις Νέων Τεχνολογιών, 2014.

Νοτόπουλος, Πάνος. Προγραμματίζοντας στη λογική : PROLOG : εισαγωγή στη γλώσσα της τεχνητής νοημοσύνης = PROgramming in LOGic. Θεσσαλονίκη : Ανικούλα, 2008.

Additional material

COSTING (ΠΛ0824)

Coordinator: **Vazakidis Athanasios**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **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):
Καραγιάννης, Δημήτρης Ι; Καραγιάννη, Αικατερίνη Δ; Καραγιάννης, Ιωάννης Δ..Κοστολόγηση με την ομάδα 9 του Γ.Λ.Σ., μηνιαία κοστολόγηση, ετήσια κοστολόγηση, διακίνηση αποθήκης : στην πράξη. Θεσσαλονίκη : [χ.ό.], 2009.
Garrison, Ray H; Noreen, Eric W. Διοικητική λογιστική. Αθήνα : Κλειδάριθμος, c2005.

Additional material

DISTRIBUTED SYSTEMS (ΠΛ0809)

Coordinator: **Margaritis Konstantinos**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Margaritis Konstantinos*

General Competences

Subjects covered: operation principles, design and progarmming of distributed systems. Emphasis is placed mainly on the implementation of distributed applications, the programming interfaces and middleware, not on distributed infrastructures and algorithms. Java is used as programming language. The student must be able to design and implement a distributed application in Java by means of application programming interfaces and middleware, focusing on internet based distributed information systems.

Course Content

Distributed Systems, Distributed ApplicationsInternet, TCP/IP and WWWClient-Server Model, Multi-Tier Architectures, Java AppletsConcurrency, Multithreaded Client-ServerData Base Servers, Data Replication, Distributed TransactionsRPC, RMI and Distributed ObjectsXML, XML-RPC, Web ServicesDistributed Systems Models and DesignBots, Agents and SpidersUbiquitous and Mobile Computing

Assessment

Midterm tests 50%
Final coursework and oral examination 50%

Course Bibliography

(One of the following):
Κάβουρας, Ι. Κ. Συστήματα υπολογιστών. Αθήνα : Κλειδάριθμος, c2011.
Tanenbaum, Andrew S; Steen, Maarten van. Κατανεμημένα συστήματα : αρχές και υποδείγματα. Αθήνα : Κλειδάριθμος, c2005.
Ince, Darrel; Μαργαρίτης, Κωνσταντίνος Γ. Κατανεμημένες εφαρμογές και ηλεκτρονικό εμπόριο. Εκδόσεις Πανεπιστημίου Μακεδονίας, c2007

Additional material

Instructor's website

ELECTRONIC COMMERCE (ΠΛ0807)

Coordinator: **Vlachopoulou Maro**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Vlachopoulou Maro, Fouskas Konstantinos*

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 Stu

Assessment

Course Bibliography

(One of the following):
Βλαχοπούλου, Μάρω; Δημητριάδης, Σέργιος. ελεκτρονικό επιχειρείν & μάρκετινγκ : καινοτόμα μοντέλα σε ψηφιακό περιβάλλον. [Αθήνα] : Rosili, 2014.
Chaffey, Dave. Ηλεκτρονικό επιχειρείν και ηλεκτρονικό εμπόριο : στρατηγική και υλοποίηση. Αθήνα : Κλειδάριθμος, c2008.
Turban, Efraim; Σαμαράς, Γιάννης Β. Ηλεκτρονικό εμπόριο 2010 : αρχές, εξελίξεις, στρατηγική από τη σκοπιά του manager. Αθήνα : Μ. Γκιούρδας, 2011.
Γεωργιάδου, Ελισάβετ Γ; Τριανταφύλλου, Ευάγγελος Γ; Οικονομίδης, Αναστάσιος. e-οικονομία, εμπόριο, μάρκετινγκ, διακυβέρνηση. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2011.

Additional material

EUROPEAN INTEGRATION (ΠΛ0609)

Coordinator: **Katsouli-Katou Helen**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Katsouli-Katou Helen*

General Competences

Upon completion of this course, students should be able to:
(a) Understand the basic principles of European Integration
(b) Identify the main theories of European Integration
(c) Apply the methodologies of European Integration on real cases
(d) Use the tools of European Integration in decision – making, both in the European Union and in its member-states separately

Course Content

- Introduction to economic integration
- The formation and expansion of the E.E.C.
- Economic theory (customs union and free trade area theory, the theory of common markets, monetary integration)
- European policies and their problems (macroeconomic policies – budget, European monetary system, regional policy, external relations – microeconomic policies – common agricultural policy, social policy, other policies)
- Measuring the impact of integration
- The European Union and the rest of the world

Assessment

Course Bibliography

(One of the following):
Κατσούλη-Κάτου, Ελένη. Οικονομική ανάλυση της Ευρωπαϊκής Ένωσης. Θεσσαλονίκη : Ζυγός, 2007.
Μάρδας, Δημήτρης. Από την ΕΟΚ στην ΕΕ. Θεσσαλονίκη : Ζυγός, 2013.

Additional material

HUMAN-COMPUTER INTERACTION (ΠΛ0605)

Coordinator: **Mavridis Ioannis**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Mavridis Ioannis, Fouliras Panayotis*

General Competences

The student will (a) gain familiarity with usability issues and the fundamentals of human computer interaction, (b) learn the basic techniques, processes, models, regulations and standards for analysis, design, implementation and evaluation of user interfaces, (c) acquire experience on applying the above knowledge in laboratory conditions.

Course Content

Introduction (Basic concepts. The importance of user interface)
Theoretical foundation (Cognitive models, Sensory perception, Attention and Memory, Knowledge organization)
Interactive technologies and devices (Input / output data, Interaction Styles, Windows Systems, Multimedia and Virtual Reality, Cooperative Systems, Adaptive Interactive systems, Systems for Disabled Persons, Information Visualization)
Analysis and design of interactive systems (User-oriented Methods, HTA, GOMS)
Usability rules
Design guidelines
Development of interactive systems (state transition diagrams (STD), User Action Notation (UAN))
Fast prototyping and related development tools
Evaluation of interactive systems (Analytical Methods (Analysis keystrokes (KLM), Cognitive walkthrough, heuristic evaluation, check compatibility), Experimental methods, Exploratory methods, Questionnaire Construction Principles, Techniques of Statistical Processing and Data Analysis Methods of Assessment)
Case studies of development and evaluation of interactive systems

Assessment

Course Bibliography

(One of the following):
Αβούρης, Νικόλαος Μ. Εισαγωγή στην επικοινωνία ανθρώπου-υπολογιστή. Αθήνα : Δίαυλος, 2000.
Dix, Alan; Γκαγκάτσιου, Ε. (Ελένη); Μανιτσάρης, Αθανάσιος; Μαυρίδης, Ι. (Ιωάννης). Επικοινωνία ανθρώπου-υπολογιστή. Αθήνα : Μ. Γκιούρδας, 2007.

Additional material

KNOWLEDGE DISCOVERY FROM DATABASES (ΠΛ0823)

Coordinator: **Evangelidis Georgios**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **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):
Roiger, Richard; Geatz, Michael. Εξόρυξη πληροφορίας : ένας εισαγωγικός οδηγός με παραδείγματα. Αθήνα : Κλειδάριθμος, c2008.
Βαζιργιάννης, Μιχάλης; Χαλκίδη, Μαρία. Εξόρυξη γνώσης από βάσεις δεδομένων και τον παγκόσμιο ιστό. Αθήνα : Τυπωθήτω, 2005.
Tan, Pang-Ning; Steinbach, Michael; Kumar, Vipin; Βερύκιος, Βασίλης. Εισαγωγή στην εξόρυξη δεδομένων. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2015

Additional material

MONEY AND CAPITAL MARKETS (ΠΛ0608)

Coordinator: **Tsopoglou Stavros**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Tsopoglou Stavros, Dasilas Apostolos*

General Competences

Course Content

The content of the course "Money and Capital Markets is:
1. The presentation and analysis of Money & Capital Markets as well as the construction and management of investment portfolios in these markets.
2. More specifically we examine the institutional characteristics of the Money & Capital Markets, the theoretical basis of their operation, the financial products/services offered in them, the methods of price/profitability measurement of these products and the means of risk aversion
3. Use of spreadsheet type software for the construction and management of money & capital product price-profitability Data Bases, the statistical analysis of these data, the construction and management of investment portfolios and the use of optimization models (risk-profit)

Assessment

Course Bibliography

(One of the following):
Θωμαδάκης, Σταύρος; Ξανθάκης, Μανώλης. Αγορές χρήματος & κεφαλαίου : θεωρία και πράξη. Εκδόσεις Αθ. Σταμούλη, c2011.
Σπύρου, Σπύρος Ι. Αγορές χρήματος & κεφαλαίου. Αθήνα : Εκδόσεις Γ. Μπένου, 2013.

Additional material

NEURAL NETWORKS (ΠΛ0806)

Coordinator: **Refanidis Ioannis**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Refanidis Ioannis*

General Competences

To 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

Course Bibliography

(One of the following):
Haykin, Simon S. Νευρωνικά δίκτυα και μηχανική μάθηση. Αθήνα : Παπασωτηρίου, 2010.
Διαμαντάρας, Κωνσταντίνος. Τεχνητά νευρωνικά δίκτυα . Αθηνα : Κλειδάριθμος, c2007.

Additional material

PRODUCTION AND OPERATIONS MANAGEMENT (ΠΛ0416)

Coordinator: **Stiakakis Emmanuil**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Stiakakis Emmanuil, Nikolaidis Ioannis*

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):
Δημητριάδης, Σωτήριος Γ; Μιχιώτης, Αθανάσιος Ν. Διοίκηση παραγωγικών συστημάτων : βασικές θεωρητικές αρχές και εφαρμογές στη λήψη επιχειρηματικών αποφάσεων. Αθήνα : Κριτική, 2007.
Παππής, Κώστας Π. Διοίκηση παραγωγής : ο σχεδιασμός παραγωγικών συστημάτων. Αθήνα : Εκδόσεις Αθ. Σταμούλης, c2008.

Additional material

PROGRAMMING LANGUAGES AND COMPILERS (ΠΛ0827-1)

Coordinator: **Sakellariou Ilias**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Sakellariou Ilias*

General Competences

The student will (a) understand the main concepts and the theoretical foundations of Programming Language Compilers (b) learn techniques and algorithms applied in different stages of a compiler (lexical, syntactic, semantic analysis and code generation), (c) 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

Course Bibliography

(One of the following):

Aho, Alfred V; Αλεφραγκής, Π. (Παναγιώτης Σπ.). Μεταγλωττιστές : αρχές, τεχνικές & εργαλεία . Αθήνα : Εκδόσεις Νέων Τεχνολογιών, c2011.
Scott, Michael Lee. Πραγματολογία των γλωσσών προγραμματισμού. Αθήνα : Κλειδάριθμος, c2009.
Λάζος, Κωνσταντίνος Ε; Κατσαρός, Παναγιώτης Θ; Καραΐσκος, Ζαφείρης Κ. Μεταγλωττιστές γλωσσών προγραμματισμού : θεωρία και πράξη. Θεσσαλονίκη : Π. Κατσαρός, 2004.

Additional material

SIMULATION TECHNIQUES (ΠΛ0614)

Coordinator: **Roumeliotis Manos**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Roumeliotis Manos, Papanastasiou Demetrios*

General Competences

This course is an extended introduction to computer aided simulation techniques from the construction of simulation models to the statistical analysis of the results.

Course Content

The course presents the simulation methodologies with both specialized tools, and with general programming languages. The material includes random number generation, sampling techniques, statistical analysis of the results, the Monte Carlo method, time world view, and simulation verification and validation.

Assessment

Course Bibliography

(One of the following):

Ρουμελιώτης, Εμμανουήλ; Σουραβλάς, Σταύρος Ι. Τεχνικές προσομοίωσης : θεωρία και εφαρμογές. Θεσσαλονίκη : Τζιόλας, c2015.

Khoshnevis, Behrokh; Γεωργιάδης, Παναγιώτης; Γυφτοδήμος, Γ. (Γιώργος). Προσομοίωση διακριτών συστημάτων. Αθήνα : Δίαυλος, 1999.

Additional material

SPECIAL TOPICS IN ECONOMETRICS (ΠΛ0815)

Coordinator: **Dritsakis Nikolaos**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **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):

Δημέλη, Σοφία Π. Σύγχρονες μέθοδοι ανάλυσης χρονολογικών σειρών. Αθήνα : Εκδόσεις ΟΠΑ, 2013.
Συριόπουλος, Κώστας; Φίλιππας, Διονύσης Θ. Οικονομετρικά υποδείγματα και εφαρμογές με το EViews : χρηματοοικονομική, μακροοικονομική, καινοτομία, μάρκετινγκ, ανάλυση επιβίωσης. Θεσσαλονίκη : Ανικούλα, 2010.

Additional material

SYSTEMS PROGRAMMING (ΠΛ0730)

Coordinator: **Margaritis Konstantinos**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Margaritis Konstantinos*

General Competences

Subject covered: basic and advanced concepts of Systems Programming. The student should be able to handle the programming interfaces that provide access to – and to develop applications that are based on – libraries and software modules of a modern operating system. Shell scripting and modern scripting languages are studied, as well as more traditional progarmming languages and application programming interfaces, in Unix environment.ContentProgramming using Bash shell scripts.Modern scripting languages and systems programming applications.Interfaces and software development tools for systems programming in Unix environment.Files and directories: systems and processing.Process control, Interprocess communication (Interrupts, Signals, Message Queues, Semaphores, Shared Memory)Multithreaded (Concurrent) programming in C and Java.

Course Content

Assessment

Course Bibliography

(One of the following):
Rochkind, J. Marc. Προγραμματισμός σε Unix. Κλειδάριθμος 2004.
Kernighan, Brian W; Pike, Rob. Το περιβάλλον προγραμματισμού UNIX. Αθήνα : Κλειδάριθμος, c2011.

Additional material

TAXATION FOR INDIVIDUALS AND BUSINESS ENTITIES (ΠΛ0620)

Coordinator: **Vazakidis Athanasios**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **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):
Καραγιάννης, Δημήτρης Ι. Φορολογικά, φοροτεχνικά, αντικειμενικά κριτήρια, φορολογικές δηλώσεις : παραδείγματα, εφαρμογές : στην πράξη. 16η Έκδοση. Θεσσαλονίκη : ΙΩΑΝΝΗΣ Δ. ΚΑΡΑΓΙΑΝΝΗΣ - ΑΙΚΑΤΕΡΙΝΗ Δ. ΚΑΡΑΓΙΑΝΝΗ ΟΕ, 2013.
Γκίνογλου, Δημήτρης. Λογιστική εταιριών : φορολογία εισοδήματος φυσικών και νομικών προσώπων. Αθήνα : Rosili, c2004.

Additional material

TIME SERIES (ΠΛ0720)

Coordinator: **Papanastasiou Demetrios**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Papanastasiou Demetrios*

General Competences

The student is introduced to the basic concepts of the statistical analysis of Time Series, TS, and forecasting techniques. At the end of the course, he/she should be able to model and produce forecasts for a real life series, using the free source software R or the SPSS package.

Course Content

Introduction (time series data, examples, graphical presentation using R or SPSS)
Conventional Decomposition of a TS and forecasting
Naive forecasting techniques (exponential smoothing, Holt-Winters method, etc)
ARIMA modelling (definitions, stationary series and autocorrelation function, SARIMA models and their properties, Box and Jenkins modelling approach, forecasting)
Case studies

Assessment

Course Bibliography

(One of the following):
Μπόρα-Σέντα, Ευθυμία; Μωυσιάδης, Χρόνης. Εφαρμοσμένη Στατιστική : πολλαπλή παλινδρόμηση, ανάλυση διασποράς, χρονοσειρές. Θεσσαλονίκη : Ζήτη, 1992.
Δημέλη, Σοφία Π. Σύγχρονες μέθοδοι ανάλυσης χρονολογικών σειρών. Αθήνα : Εκδόσεις ΟΠΑ, 2013.

Additional material

VIRTUAL ENTERPRISES AND NEW TECHNOLOGIES (ΠΛ0724)

Coordinator: **Georgiadis Christos**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Georgiadis Christos, 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):

Δουκίδης, Γεώργιος Ι. Καινοτομία, στρατηγική, ανάπτυξη και πληροφοριακά συστήματα. Αθήνα : Ι. Σιδέρης, 2011.
White, Margaret A. (Margaret Alice); Bruton, Garry D; Καλογήρου, Γιάννης; Πρωτόγερου, Αιμιλία; Κωνσταντέλου, Αναστασία. Η στρατηγική διαχείριση της τεχνολογίας και της καινοτομίας. Αθήνα : Κριτική, 2010.

Additional material

WEB PROGRAMMING (ΠΛ0816)

Coordinator: **Georgiadis Christos**
Semester: 8th (Spring) | **Orientation:** AI | *Elective* | **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):
Deitel, Paul J; Deitel, Harvey M. Προγραμματισμός Internet και World Wide Web . Αθήνα : Μ. Γκιούρδας, 2011.
Ullman, Larry E. (Larry Edward). Εισαγωγή στις PHP 6 & MYSQL 5 : με εικόνες. Αθήνα : Κλειδάριθμος, c2009.

Additional material

Instructor's notes

WEB SERVICES AND TRANSACTIONS (ΠΛ0729)

Coordinator: **Georgiadis Christos**
Semester: 8th (Spring) | **Orientation:** AI | *Elective*| **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):

Weerawarana, Sanjiva. Αρχιτεκτονική πλατφόρμας υπηρεσιών ιστού : SOAP, WSDL, WS-Policy, WS-Addressing, WS-BPEL, WS-Reliable Messaging, και άλλα. Αθήνα : Κλειδάριθμος, c2008.

Θεμιστοκλέους, Μαρίνος Γ; Μαντζάνα, Βασιλική Γ. Υπηρεσίες παγκόσμιου ιστού και υπηρεσιοστρεφείς αρχιτεκτονικές : web services and SOA.Πειραιάς : [χ.ό], 2010.

Additional material

BROADBAND COMMUNICATION TECHNOLOGIES AND SERVICES (ΔΤ4701)

Coordinator: **Mamatas Eleftherios**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Mamatas Eleftherios*

General Competences

Course Content

Comprehensive introduction to Broadband Technologies, providing basic operation principles as well as technical details that will come in handy in understanding and evaluating relevant systems. The first part of the course covers Backbone networks technologies and protocols such as SONET, ATM, ETHERNET, TCP/IP along with wired (DSL) or wireless Access Technologies (WIMAX, WIFI). The course also includes a review of active or passive optical fibre networks elements and satellite access technologies, the accent being on HellasSat, the Greek satellite. The second part of the course describes Applications of Broadband Technologies, giving particular examples from international (e.g. NT Docomo/ Felica) or Greek experience (e.g., the metropolitan networks under construction in central Macedonia and their significance). Pricing examples of telecommunications services are given, too. The course is completed with a brief review of emerging broadband technologies (MIMO, 4G) and applications (widescale RFID).

Assessment

Course Bibliography

(One of the following):

Τσαουσίδης, Βασίλης Θ; Μαμάτας, Ελευθέριος; Ψαρράς, Ιωάννης κ.ά. Εργαστηριακά Μαθήματα στα Δίκτυα και Διαδίκτυα Υπολογιστών. Αθήνα: Εκδόσεις Κλειδάριθμος, 2010.

Βενιέρης, Ιάκωβος.. Δίκτυα ευρείας ζώνης : τεχνολογίες και εφαρμογές με έμφαση στο διαδίκτυο. Εκδόσεις Τζιόλα, c2013.

Additional material

DIGITAL DESIGN - MODELING OF LOGIC CIRCUITS (ΔΤ4602)

Coordinator: **Souravlas Stavros**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Souravlas Stavros*

General Competences

Course Content

Assessment

Course Bibliography

(One of the following):

Σουραβλάς, Σταύρος Ι; Ρουμελιώτης, Εμμανουήλ. Ψηφιακά συστήματα : μοντελοποίηση και προσομοίωση με την γλώσσα VHDL. Εκδόσεις Τζιόλα, c2008.
Brown, Stephen D; Vranesic, Zvonko G; Δημόπουλος, Μιχαήλ Γ. Σχεδίαση ψηφιακών συστημάτων με τη γλώσσα VHDL. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2012.

Additional material

ELECTRONIC COMMERCE (ΠΛ0807)

Coordinator: Vlachopoulou Maro
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Vlachopoulou Maro, Fouskas Konstantinos*

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):
Βλαχοπούλου, Μάρω; Δημητριάδης, Σέργιος. ελεκτρονικό επιχειρείν & μάρκετινγκ : καινοτόμα μοντέλα σε ψηφιακό περιβάλλον. [Αθήνα] : Rosili, 2014.
Chaffey, Dave. Ηλεκτρονικό επιχειρείν και ηλεκτρονικό εμπόριο : στρατηγική και υλοποίηση. Κλειδάριθμος, c2008.
Turban, Efraim; Σαμαράς, Γιάννης Β. Ηλεκτρονικό εμπόριο 2010 : αρχές, εξελίξεις, στρατηγική από τη σκοπιά του manager. Μ. Γκιούρδας, 2011.
Γεωργιάδου, Ελισάβετ Γ; Τριανταφύλλου, Ευάγγελος Γ; Οικονομίδης, Αναστάσιος. e-οικονομία, εμπόριο, μάρκετινγκ, διακυβέρνηση. Θεσσαλονίκη : Εκδόσεις Τζιόλα, c2011.

Additional material

ELECTRONIC GOVERNANCE (ΔΤ4503)

Coordinator: **Tambouris Efthimios**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Tambouris Efthimios*

General Competences

Course Content

Use of state of the art technologies and digital connection of governmental information infrastructures for the modernisation of Public Administration, saving of resources and improvement of services to citizens and businesses. The technological and organisational foundations are examined as well as the international trends with an emphasis on the European Union. The areas covered include public service provision, one-stop government, interoperability and open government data using state of the art technologies, e.g. linked open data.

Assessment

Course Bibliography

(One of the following):

Αποστολάκης, Ιωάννης Α; Λουκής, Ευριπίδης; Χάλαρης, Ι. (Ιωάννης). Ηλεκτρονική δημόσια διοίκηση : οργάνωση, τεχνολογία και εφαρμογές. Αθήνα : Παπαζήσης, 2008.

Πομπόρτσης, Ανδρέας Σ. 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.

Additional material

ENTREPRENEURSHIP CASE STUDIES (ΔΤ4403)

Coordinator: **Fouskas Konstantinos**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Fouskas Konstantinos*

General Competences

The Entrepreneurship Case Studies 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.

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 and entrepreneurship in rising economies.

Assessment

Course Bibliography

(One of the following):
Καραγιάννης, Η. Γ. (Ηλίας Γ.); Μπακούρος, Ιωάννης. Καινοτομία και επιχειρηματικότητα : θεωρία, πράξη. Θεσσαλονίκη : Σοφία, 2010.
Σαλαβού, Ελένη Ε. Καινοτομία και αλλαγή στο "επιχειρείν". [Αθήνα] : Rosili, 2013.

Additional material

MONEY AND CAPITAL MARKETS (ΠΛ0608)

Coordinator: **Tsopoglou Stavros**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Tsopoglou Stavros, Dasilas Apostolos*

General Competences

Course Content

The content of the course "Money and Capital Markets is:
1. The presentation and analysis of Money & Capital Markets as well as the construction and management of investment portfolios in these markets.
2. More specifically we examine the institutional characteristics of the Money & Capital Markets, the theoretical basis of their operation, the financial products/services offered in them, the methods of price/profitability measurement of these products and the means of risk aversion
3. Use of spreadsheet type software for the construction and management of money & capital product price-profitability Data Bases, the statistical analysis of these data, the construction and management of investment portfolios and the use of optimization models (risk-profit)

Assessment

Course Bibliography

(One of the following):
Θωμαδάκης, Σταύρος; Ξανθάκης, Μανώλης. Αγορές χρήματος & κεφαλαίου : θεωρία και πράξη. Αθήνα : Εκδόσεις Αθ. Σταμούλη, c2011.
Σπύρου, Σπύρος Ι. Αγορές χρήματος & κεφαλαίου. Αθήνα : Εκδόσεις Γ. Μπένου, 2013.

Additional material

NETWORK-CENTRIC SOFTWARE (ΔΤ4704)

Coordinator: **Xinogalos Stylianos**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Xinogalos Stylianos*

General Competences

Students must be able to distinguish between the various types of applications that can be developed using the technology of Java and choose the most appropriate type for each occasion. Also, students must be able to design and implement completed applications (autonomous and web-based applications, applets) in Java.
Content
Presentation of special topics on software design and engineering using the object-oriented programming technique and the network-centric programming language Java. Comparative presentation of the main characteristics and role of different types of programs in Java: applications, applets, servlets and JavaServer pages (JSP). Emphasis is given on designing and implementing a complete application in Java: conducting needs-requirements analysis, designing the application according to the principles of the object-oriented technique of designing programs, designing the UML class diagram of the application, implementing the user interface and the functionalities of the application, writing documentation.

Course Content

Introduction to Parallel Processing
Shared and Distributed Memory Parallel Systems Architecture.
Data and Functional Parallelism.
Data Partinioning.
Load Balancing.
Process Communication.
Synchronous Parallelism.
Replicated Workers.
Distributed Termination Detaction.

Assessment

Course Bibliography

(One of the following):
Hall, Marty; Brown, Larry; Chaikin, Yaakov. Servlets και σελίδες διακομιστή Java : τεχνολογίες πυρήνα. Αθήνα : Κλειδάριθμος, c2006.
Lervik, Else; Havdal, Vegard B. Java και UML : αντικειμενοστρεφής σχεδίαση και προγραμματισμός. Αθήνα : Κλειδάριθμος, c2004.
Λιακέας, Γιώργος. Εισαγωγή στην Java : καλύπτει και την έκδοση SE 8 (JDK 1.8). Αθήνα : Κλειδάριθμος, c2015.

Additional material

PROJECT PLANNING AND MANAGEMENT (ΔΤ4301)

Coordinator: **Tambouris Efthimios**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Tambouris Efthimios, Mantas Michael*

General Competences

The aim of this course is to provide students with the basic principles of Project Management as well as the challenges faced by managers of Information and Communication Technologies project.

Course Content

Project planning, design, implementation, review and evaluation. Project design techniques and methods include work breakdown structure, critical path analysis, Gantt chart, PERT, cost analysis, risk and change management.

Assessment

Course Bibliography

(One of the following):
Phillips, Joseph; Κατσώνης, Νικόλαος Δ. Διαχείριση έργων πληροφορικής. Αθήνα : Μ. Γκιούρδας, 2007.
Maylor, Harvey. Διαχείριση έργων. Αθήνα : Κλειδάριθμος, c2005.

Additional material

SIMULATION TECHNIQUES (ΠΛ0614)

Coordinator: **Roumeliotis Manos**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Roumeliotis Manos, Papanastasiou Demetrios*

General Competences

This course is an extended introduction to computer aided simulation techniques from the construction of simulation models to the statistical analysis of the results.

Course Content

The course presents the simulation methodologies with both specialized tools, and with general programming languages. The material includes random number generation, sampling techniques, statistical analysis of the results, the Monte Carlo method, time world view, and simulation verification and validation.

Assessment

Course Bibliography

(One of the following):

Ρουμελιώτης, Εμμανουήλ; Σουραβλάς, Σταύρος Ι. Τεχνικές προσομοίωσης : θεωρία και εφαρμογές. Θεσσαλονίκη : Τζιόλας, c2015

Khoshnevis, Behrokh; Γεωργιάδης, Παναγιώτης; Γυφτοδήμος, Γ. (Γιώργος). Προσομοίωση διακριτών συστημάτων. Αθήνα : Δίαυλος, 1999.

Additional material

SPECIAL ISSUES OF STRATEGIC MANAGEMENT (ΠΛ0830)

Coordinator: **Kitsios Fotios**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **Weekly hours:** 3 | **ECTS:** 5
Instructors: *Kitsios Fotios*

General Competences

The course Special Issues of Strategic Management is an advanced course in strategy, which aims to give students theoretical and practical knowledge in a series of topical issues of strategic management that concern every company and organization with particular emphasis in the new digital economy and emerging technologies.

Course Content

Competitive strategy, strategic business models, strategy development models, learning organization and strategic change, strategic Innovation, imitation strategy, value creation through multiple activities, corporate governance and strategy, modern methodologies, tools and practices (scenario planning, benchmarking, outsourcing, strategic alignments , balanced scorecard), strategic decision making, strategy in e-business, strategy and ict. Case Studies.

Assessment

Course Bibliography

(One of the following):

Γεωργόπουλος, Νικόλαος Β. Στρατηγικό μάνατζμεντ. Αθήνα : Εκδόσεις Γ. Μπένου, 2013.
White, Margaret A. (Margaret Alice); Bruton, Garry D; Καλογήρου, Γιάννης; Πρωτόγερου, Αιμιλία; Κωνσταντέλου, Αναστασία. Η στρατηγική διαχείριση της τεχνολογίας και της καινοτομίας. Αθήνα : Κριτική, 2010.
Deakins, David; Freel, Mark S; Πέκκα-Οικονόμου, Βικτωρία; Χατζηδημητρίου, Ιωάννης. Επιχειρηματικότητα και μικρές επιχειρήσεις : νεοφυείς επιχειρήσεις : μια δυναμική απάντηση των νέων στην ανεργία. Αθήνα : Rosili, c2015.
Παπακωνσταντίνου, Γιώτα Σ. Στρατηγικό μάνατζμεντ : εφαρμογές μοντέλων στρατηγικής σε περίοδο οικονομικής κρίσης. Αθήνα : Κλειδάριθμος, c2011.
Θεοδωρόπουλος, Ανδρέας. Στρατηγικός επιχειρηματικός σχεδιασμός : πώς να πραγματοποιήσετε την ανάπτυξη της επιχείρησής σας : με υπόδειγμα επιχειρησιακού σχεδίου. Αθήνα : Προπομπός, 2003.
Dixit, Avinash K; Nalebuff, Barry; Γιαμαλίδου, Μαρία. Πώς να σκέπτεσθε στρατηγικά : η εφαρμογή της στρατηγικής στην πολιτική, στις επιχειρήσεις και στην καθημερινή ζωή. Αθήνα : Καστανιώτης, 2001.

Additional material

TECHNOLOGICAL INNOVATION MANAGEMENT (ΔΤ4405)

Coordinator: **Kitsios Fotios**
Semester: 8th (Spring) | **Orientation:** TM | *Elective*| **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):

Παπαδάκης, Βασίλης Μ. Επίκαιρα θέματα στρατηγικής των επιχειρήσεων. Αθήνα : Εκδόσεις Ε. Μπένου, 2009.
Καινοτομία και αλλαγή στο επιχειρείν. Καινοτομία και αλλαγή στο "επιχειρείν" . [Αθήνα] : Rosili, 2013.
Robbins, Stephen P; Judge, Tim; Σαχινίδης, Αλέξανδρος Γ; Robbins, Stephen P. Οργανωσιακή συμπεριφορά : βασικές έννοιες και σύγχρονες προσεγγίσεις. Αθήνα : Εκδόσεις Κριτική, 2011.
Βακόλα, Μαρία; Νικολάου, Ιωάννης. Οργανωσιακή ψυχολογία & συμπεριφορά. [Αθήνα] : Rosili, c2012.
Yukl, Gary A; Αντωνίου, Αλέξανδρος-Σταμάτιος. Η ηγεσία στους οργανισμούς. Αθήνα : Κλειδάριθμος, c2009.
Βακόλα, Μαρία.. Διοικώντας τις αλλαγές : παράγοντες επιτυχίας. Αθήνα : Ι. Σιδέρης, 2009.

Additional material