



Program of Studies
Department of Applied Informatics
2012 - 2013



Department of Applied Informatics

According to the Establishing act of the Department of Applied Informatics, its mission is to promote and further develop the science of informatics, with special emphasis on the development of systems for managerial and economic applications and the training of high level executives for the country's needs.

In addition to the theoretical education offered to the students, particular attention is paid to their practical training on developing software for economic and managerial applications.

The programme of studies includes courses from the disciplines of Computer Science, Economics and Business Administration. The department's graduates are well qualified to meet the demanding requirements of the modern business world.

Course Curriculum

University of Macedonia - Department of Applied Informatic

Code ΠΑ0101-2 **Core** **Semester** 1

Title Introduction to Informatics

Instructor(s) Ioannis Mavridis (33%), Ioannis Refanidis (33%), Nikolaos Samaras (34%)

Objective (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.

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 (optional) 30%

Textbooks Foundations of Computer Science (2nd international edition)
by Behrouz A. Forouzan and Firouz Mosharraf
Cengage Learning Business Press, 2007
ISBN: 978-1844807000

Computer Science, an overview (11th international edition)
by J. Glenn Brookshear
Addison Wesley, 2011
ISBN: 978-0132569033

Supplemental material Instructor's Notes and Slides

Code	ΠΛ0102-3	Core	Semester	1
Title	Algorithms with C			
Instructor(s)	Nikolaos Samaras			
Objective	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.			
Content	<p>Algorithms and Problems. Historical review, Definitions and properties of Algorithms, Computational problems, Description of algorithms, Basic concepts of algorithms (Iterative, Recursive, Stochastic, Heuristic).</p> <p>Iterative Sorting Algorithms. Selection Sort, Bucket Sort, Bubble Sort, Radix Sort.</p> <p>Searching Algorithms: Linear Search, Binary Search.</p> <p>Data Structures: Stack, Queue, Cyclic queue, Linked lists (single and double), Heaps, Heap Sort.</p> <p>Recursive Algorithms: Factorial, Fibonacci Numbers, Anoi Towers, Transformation from recursive to iterative.</p> <p>Divide and conquer: Quick Sort, Merge Sort, Matrix Multiplication, Strassen Multiplication, Polynomial Multiplication.</p> <p>Graph Algorithms: Depth First Search, Breadth First Search, Graph connectivity, Directed acyclic graphs.</p> <p>Special Topics on Algorithms: On-line algorithms, Dynamic Programming, Greedy algorithms, Backtracking, Branch and Bound.</p> <p>Laboratory. Implementation of basic sorting and searching algorithms using C.</p>			
Assessment	Written Final examination 100% Coursework (optional) 30%			
Textbooks	<p>The Art of Computer Programming, Vol. 1 Fundamental Algorithms by Donald Knuth Tziolas Publications, 2009 ISBN: 978-960-418-184-1</p> <p>Algorithmic solution of exercises using C programming language by Alexandros Karakos Karakos Publications, 2010 ISBN: 960-931901-7</p> <p>Algorithms, Computer Programs and Applications with FORTRAN & Visual BASIC by Konstantinos Tsouros Zygos Publications, 2009</p>			
Supplemental material	Instructor's Notes and Slides			

Code	ΠΛ0106-3	Core	Semester	1
Title	Procedural Programming			
Instructor(s)	Maria Satratzemi (50%), Alexander Chatzigeorgiou (25%), Ilias Sakellariou (25%)			
Objective	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.			
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%			
Textbooks	The Art and Science of C, E.S. Roberts Addison Wesley 1994 978-0201543223 The C programming language in depth N. Chatzigiannakis Klidiarimos Press 2009 978-960-461-208-6			
Supplemental material				

Code	ΠΛ0111	Core	Semester	1
Title	Applied Mathematics I			
Instructor(s)	George Stephanides, Dimitris Hristu-Varsakelis			
Objective	Introduction to Mathematical Analysis. Linear Algebra and Applications to Economics and Business.			
Content	Introduction to the Theory of Functions. Examples of Functional Forms. Limits. Matrices. Determinants. Linear Systems. Applications to Economics and Business. Introduction to MAPLE.			
Assessment	Written Final examination			
Textbooks	1. Εφαρμοσμένα μαθηματικά για Οικονομικές Επιστήμες τ. Ι, Γ. Πέκος, Εκδ. ΖΥΓΟΣ, 2006 2. Μαθηματικές Μέθοδοι Οικονομικής Ανάλυσης, A. Chiang, K. Wainwright, Εκδ. ΚΡΙΤΙΚΗ, 2009			
Supplemental material	Instructor's Notes			

Code	ΠΛ0113	Core	Semester	1
Title	Management Information Systems			
Instructor(s)	Vassiliki Manthou			
Objective	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.			
Content	<p>Business information systems in the career</p> <p>E-Business: How businesses use information systems</p> <p>Achieving competitive advantage with information systems</p> <p>Information technology infrastructure</p> <p>Achieving Operational Excellence and Customer Intimacy: Enterprise applications</p> <p>E-Commerce: Digital Markets, Digital Goods</p> <p>Building and managing systems</p> <p>Improved decision making and managing knowledge</p> <p>Ethical and social issues in information systems</p>			
Assessment	<p>Case Studies 20%</p> <p>Exams 80%</p>			
Textbooks	<p>Management Information Systems</p> <p>Laudon, Kenneth., Laudon, Jane</p> <p>Klidarithmos, 8th Edition 2009, ISBN ISBN 978-960-461-251-2</p> <p>Innovation, Strategic Development and Information Systems</p> <p>Doukidis, G.</p> <p>ed Sideris, 2010, ISBN 978-960-08-0528-4</p>			
Supplemental material	Instructor's Notes			

Code	ΠΛ0105-2	Core	Semester	1
Title	Introduction to Economics			
Instructor(s)	Eleni Katsouli			
Objective	<p>Upon completion of this course, students should be able to:</p> <p>(a) Understand the basic principles of Economics</p> <p>(b) Identify the main theories of Economics</p> <p>(c) Apply the methodologies of Economics on real cases</p> <p>(d) Use the tools of Economics in decision - making</p>			
Content	<ul style="list-style-type: none"> - 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	<p>Final written examinations 100%</p> <p>Alternatively</p> <p>Two progress examinations 100%</p>			
Textbooks	<p>Mankiw, G. and Taylor, M. (2011) Principles of Economic Theory, Athens: Gutenberg (translated into Greek).</p> <p>Begg, D., Fischer, S. and Dornbush, R. (2011) Introduction to Economics, Athens: Kritiki Publications (translated into Greek).</p>			
Supplemental material	Instructor's notes and transparencies			

Code	ΠΛ0201	Core	Semester	2
Title	Data Structures			
Instructor(s)	Maria Satratzemi			
Objective	The objective 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.			
Content	<p>Introduction to Data Structures.</p> <p>Stacks, Basic operations, implementing stacks with arrays and records, application of stacks.</p> <p>Queues, Basic operations, implementing Queues with arrays and records, application of Queues.</p> <p>Lists, Basic operations, sequential storage implementation of Lists.</p> <p>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.</p> <p>Linked implementation of sparse polynomials.</p> <p>Binary Trees, basic operations. A pointer-based implementation of Binary Trees. A recursive implementation of Binary trees. Application of Binary Trees: Huffman Codes.</p> <p>Hashing, open probing, Chaining.</p> <p>B-Trees. AVL Trees, basic operations.</p>			
Assessment	<p>Written Examination 80%</p> <p>Compulsory Assignments 20%</p>			
Textbooks	<p>Data Structures in C</p> <p>N. Misisrlis</p> <p>N. Misisrlis, 2008</p> <p>960-92031-1-6</p>			
Supplemental material				

Code	ΠΛ0509-2	Core	Semester	2
Title	Introduction to Algorithm Analysis			
Instructor(s)	Maria Satratzemi, George Stephanides			
Objective	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.			
Content	<p>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 (Breadth first search, Depth first search, Topological order, Bipartite graphs, connectivity). Laboratory: Algorithm programming and computational studies to evaluate the practical complexity of algorithms.</p>			
Assessment	Written Final examination 100%			
Textbooks	<p>Design and analysis of algorithms Paparrizos K. Tziolas Editions, 2010</p> <p>Introduction to Algorithms Cormen T. H., Leiserson Ch. E., Rivest R. L. Stein C., The MIT press, 2002</p>			
Supplemental material	<p>Instructor's Notes</p> <p>Stuart Russell και Peter Norvig Artificial Intelligence, A Modern Approach Pearson Education; 3rd Edition, 2010, ISBN-13: 978-0132071482</p>			

Code	ΠΛ0112	Core	Semester	2
Title	Applied Mathematics II			
Instructor(s)	George Stephanides, Dimitris Hristu-Varsakelis			
Objective	Elements of Differential and Integral Calculus with Applications to Economics and Business.			
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.			
Assessment	Written Final examination			
Textbooks	1. Εφαρμοσμένα μαθηματικά για Οικονομικές Επιστήμες τ. II, Γ. Πέκος, Εκδ. ΖΥΓΟΣ, 2006 2. Γραμμική Άλγεβρα με το MATLAB, Γ. Στεφανίδης, Εκδ. ΖΥΓΟΣ, 2000			
Supplemental material	Instructor's Notes			

Code	ΠΛ0108-2	Core	Semester	2
Title	Computational & Discrete Mathematics			
Instructor(s)	George Stephanides			
Objective	The study of discrete objects and relationships among them. The study and implementation of computational methods in finite algebraic structures.			
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			
Textbooks	1. Μια Υπολογιστική Εισαγωγή στη Θεωρία Αριθμών και την Άλγεβρα, V. Shoup, Εκδ. ΚΛΕΙΔΑΡΙΘΜΟΣ, 2007 2. Διακριτά Μαθηματικά με Εφαρμογές, S. Epp, Εκδ. ΚΛΕΙΔΑΡΙΘΜΟΣ, 2010 3. Διακριτά Μαθηματικά και Εφαρμογές τους, K. Rosen, Εκδ. ΤΖΙΟΛΑ, 2008			
Supplemental material	Instructor's Notes.			

Code	ΠΛ0104	Core	Semester	2
Title	Statistics I			
Instructor(s)	Adamantios Haritou			
Objective	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.			
Content	Populations - samples, sampling, position and dispersion measures, propensities, tables, introduction to probabilities, random variable, theoretical and derived distributions.			
Assessment	Written Examination 100%			
Textbooks	<p>Statistical Exercises Georgios Dim. Pecos 1999, ZUGOS</p> <p>Descriptive Statistics Authors: Dimitriadis, Efstathios Publisher: CRITICAL EDITIONS SA</p>			
Supplemental material	<p>Tutor's notes and course slides Descriptive and exploratory statistical data analysis A' Edition: 2nd Edition Authors: Cleon Chiba, H. Georgiakodis, Publisher: EDITIONS STAMOULI SA</p>			

Code	ΠΛ0502-1	Core	Semester	2
Title	Financial Accounting			
Instructor(s)	Athanasios Vazakidis (50%), Antonios Stavropoulos (50%)			
Objective	<p>This course is aiming to:</p> <p>Enable students familiar and aware of the essentials of accounting.</p> <p>Enable students capable of posting entries belonged to the general or financial accounting (Journal, general ledger, balance sheets).</p> <p>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).</p> <p>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.</p>			
Content	<p>Essentials of accounting, general accepted accounting principles (G.A.A.P), Objective 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.</p>			
Assessment	<p>Laboratory exams 35%</p> <p>Final writing exams 65%</p>			
Textbooks	<ol style="list-style-type: none"> Vazakidis, A., Stavropoulos, A., Tsopoglou, S. (2010), Financial Accounting - national general chart of accounts, Edition 2nd, Thessaloniki, Greece. Karagiannis, D., Karagiannis, I., Karagianni, A. (2011), Application and analysis of Greek general chart of accounts with case studies, Edition 8th, Thessaloniki, Greece. Notes and slides given during the lectures. 			
Supplemental material	<ol style="list-style-type: none"> Meigs, W., and Meigs, R. (1998), Accounting the base of corporate decisions, Volumes A' and B', Papazisis, Athens, Greece. Ginoglou, D., Taxinakis, P., Moisi, S. (2005), General financial accounting, Rosili, Athens, Greece. Needles, B., Powers, M., Crosson, S. (2008), Financial and managerial accounting, South Western, USA. 			

Code	ΠΛ0401	Core	Semester	3
Title	Object-Oriented Programming			
Instructor(s)	Alexander Chatzigeorgiou			
Objective	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.			
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			
Textbooks	Java the UML way, by E. Lervik and V. Havdal, published by John Wiley and Sons, 2002 ISBN: 978-0470843864 The Art and Science of Java by E. S. Roberts published by Addison-Wesley 2007 ISBN: 978-0321486127			
Supplemental material				

Code	ΠΛ0304-1	Core	Semester	3
Title	Computer Architecture			
Instructor(s)	Konstantinos Margaritis (70%), Ilias Sakellariou(30%)			
Objective	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.			
Content	<p>Introduction: Structured Computer Organization, Survey of Modern Computer Systems: Processor, Memory, Buses, I/O.</p> <p>Digital Logic: Information Representation, Logic Gates and Boolean Algebra, Basic Combinatorial Circuits, Basic Sequential Circuits and Memory, Buses.</p> <p>Microarchietcture: Data Paths and Memory Models, Execution of Instructions and Microisnstructions, Instruction Level Parallelism, Cache Memory, Performance Improvements.</p> <p>Instruction Set Architecture: Data Types, Instruction Formats, Addressing Modes, Instruction Types, Flow Control, Assembly Language Programming.</p>			
Assessment	Written Final examination 70-100% Coursework 0-30%			
Textbooks	<p>STRUCTURED COMPUTER ORGANIZATION, A.S. TANENBAUM, Prentice-Hall</p> <p>COMPUTER ARCHITECTURE AND ORGANIZATION, W. STALLINGS, Prentice-Hall</p> <p>COMPUTER ORGANIZATION AND DESIGN, PATTERSON, HENNESSY, ELSEVIER</p>			
Supplemental material	Instructors' Web Site			

Code	ΠΛ0501-1	Core	Semester	3
Title	Databases I			
Instructor(s)	Georgios Evangelidis			
Objective	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.			
Content	<p>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)</p>			
Assessment	<p>Written Final examination 80% Coursework 20%</p>			
Textbooks	<p>Database Management Systems Ramakrishnan Raghu, Gehrke Johannes</p> <p>Fundamentals of Database Systems, Vol. 1 Elmasri Ramez, Navathe Shamkant B.</p>			
Supplemental material	Instructor's Notes			

Code	ΠΛ0202	Core	Semester	3
Title	Statistics II			
Instructor(s)	Demetrios Papanastassiou			
Objective	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.			
Content	<p>Statistical data (introduction to R, entry and presentation of data)</p> <p>Basic Inference (sample, LLN, CLT, point estimation, confidence intervals for means, proportions and variances)</p> <p>Hypothesis Testing (fundamental notions, testing for means, proportions and variances, χ^2-tests, ANOVA)</p> <p>Regression Analysis (fundamental notions, diagnostic checking, case studies)</p> <p>Sampling Methods (fundamental methods)</p>			
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.			
Textbooks	<p>Επαγωγική Στατιστική, Τεύχος II Γ. Παπαδημητρίου Εκδόσεις Γ. Guttenberg, Δαρδανός & Σια Ε.Ε., Αθήνα, 2004, ISBN: 978-960-402-228-1</p> <p>Στατιστική, Θεωρία, Εφαρμογές Φ. Κολυβά-Μαχαίρα, Ε. Μπόρα-Σέντα Εκδόσεις Ζήτη, Θεσσαλονίκη, 1998, ISBN: 960431338X</p>			
Supplemental material	<p>Introductory Statistics for Business and Economics T. H. Wonnacott, R. J. Wonnacott Wiley, New York, 1990, ISBN: 9780471615170</p> <p>Statistical Analysis and Data Display, An Intermediate Course with Examples in S-Plus, R, and SAS R. M. Heiberger, B. Holland Springer, New York, 2004, ISBN: 0-387-40270-5</p>			

Code	ΠΛ0316	Core	Semester	3
Title	Digital Economics			
Instructor(s)	Emmanouil Stiakakis			
Objective	(a) To investigate the characteristics of the digital economy, (b) to comprehend the way in which these characteristics, related to each other, contribute to the improvement of the micro- and macro-economic measures, (c) to understand how the digital economy differs from the conventional economy, (d) to acquire knowledge regarding specific applications of the Information and Communication Technologies on the modern economy.			
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%			
Textbooks	New Economy, Internet, and E-Commerce, by Ioannis Katsoulakos, published by Kerkyra, 2001 ISBN: 960-86003-8-3, Digital Economics: How Information Technology Has Transformed Business Thinking, by Richard McKenzie, published by Praeger Publishers, 2003 ISBN: 1-56720-644-1			
Supplemental material				

Code	ΠΛ0502	Core	Semester	3
Title	Finance			
Instructor(s)	Stavros Tsopoglou			
Objective	<p>Students are introduced to the following concepts and practices in Finance:</p> <ol style="list-style-type: none"> 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. 			
Content	<ol style="list-style-type: none"> 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	<p>The final grade is based on the following weighted elements:</p> <ol style="list-style-type: none"> 1. Final Examination (2 hours): Short problem solving and small theoretical questions 70% 2. Small exercises throughout the semester 5% 3. Case Study (to be submitted by Final Exam date) 20% 4. In class participation 5% <p>T O T A L (10) 100%</p>			
Textbooks	<p>one of the following :</p> <ol style="list-style-type: none"> 1. «ΒΑΣΙΚΕΣ ΑΡΧΕΣ ΤΗΣ ΧΡΗΜΑΤΟΟΙΚΟΝΟΜΙΚΗΣ ΔΙΑΧΕΙΡΙΣΗΣ ΚΑΙ ΠΟΛΙΤΙΚΗΣ», BRINGHAM F., WESTON J. FRED ΕΚΔΟΣΕΙΣ ΠΑΠΑΖΗΣΗ ΑΕΒΕ, ΑΘΗΝΑ 1986 2. «ΧΡΗΜΑΤΟΟΙΚΟΝΟΜΙΚΗ ΑΝΑΛΥΣΗ ΕΠΙΧΕΙΡΗΣΕΩΝ» ΞΑΝΘΑΚΗΣ ΜΑΝΩΛΗΣ, ΑΛΕΞΑΚΗΣ ΧΡΗΣΤΟΣ ΕΚΔΟΣΕΙΣ ΣΤΑΜΟΥΛΗ ΑΕ ΑΘΗΝΑ, 2007 			
Supplemental material	<ol style="list-style-type: none"> 1. «ΛΟΓΙΣΤΙΚΗ Η ΒΑΣΗ ΤΩΝ ΕΠΙΧΕΙΡΗΜΑΤΙΚΩΝ ΑΠΟΦΑΣΕΩΝ» MEIGS, F.R. Εκδ. Παπαζήση, Αθήνα, 1988 (Μετάφραση από αγγλικά) 2. «FINANCIAL MANAGEMENT AND POLICY» VAN HORNE J.C Prentice Hall, New York, 1992 3. Χρήση και Εφαρμογές του Excel στην Οικονομία και τη Διοίκηση» Α. Οικονομίδης, Β. Καρατζόγλου, Θ. Χατζιδάκη Πανεπιστήμιο Μακεδονίας, Θεσσαλονίκη, 2011 4. Any guide for the use of Excel type Spreadsheets 			

Code	ΠΛ0613	Core	Semester	4
Title	Software Engineering			
Instructor(s)	Alexander Chatzigeorgiou			
Objective	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.			
Content	<p>Software Engineering Principles. Problems in the development of software projects. Differences from other technical disciplines. Product and process characteristics. Life cycle models.</p> <p>Software project management. Cost estimation, COCOMO.</p> <p>Requirements analysis and specification. Formal methods for requirements specification (Pre-post conditions, FSM, Petri Nets, Algebraic specifications, Z language). Structured Analysis.</p> <p>Architectural software design. Modularity, Abstraction, coupling - cohesion. Structured design.</p> <p>Object-oriented analysis and design methodologies. Unified Modeling Language.</p> <p>Coding. Testing, Theoretical foundations of testing. Documentation.</p> <p>Software metrics.</p> <p>Computer-Aided Software Engineering (CASE) tools.</p> <p>Applications with UML and C++/Java.</p> <p>Case Study: development of a complete software project.</p>			
Assessment	Written Examination 65% Compulsory Group Assignment 35%			
Textbooks	<p>Object-Oriented Design: UML, Principles, Patterns and Heuristics A. Chatzigeorgiou Klidarithmos Press 2005 ISBN: 960-209-882-1</p> <p>Object-Oriented Software Development with UML V. Gerogiannis, G. Kakarontzas, A. Kameas, G. Stamelos, P. Fitsilis Klidarithmos Press 2006 ISBN: 960-209-913-5</p>			
Supplemental material				

Code	ΠΛ0313-2	Core	Semester	4
Title	Linear & Network Programming			
Instructor(s)	Nikolaos Samaras			
Objective	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.			
Content	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Minimum spanning tree algorithms. Kruscal algorithm, Prim algorithm.</p> <p>Sensitivity analysis. Classical sensitivity analysis, Changes in the cost variables, Changes in the right hand side.</p>			
Assessment	Written Final examination 100%			
Textbooks	<p>Linear Programming: An approach with MATLAB by Konstantinos Paparrizos Zygos Publications, 2009 ISBN: 978-960-8065-67-3</p> <p>Linear Programming. Optimization in Networks by Manolis Loukakis Sofia Publications, 1994 ISBN: 960-87438-8-5</p>			
Supplemental material	Instructor's Notes and Slides			

Code	ΠΛ0404	Core	Semester	4
Title	Operating Systems			
Instructor(s)	Konstantinos Margaritis			
Objective	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.			
Content	Types, structure and evolution of operating systems. Programming and usage interfaces. Hardware interface. Processor management, process scheduling, interprocess communication, deadlocks. Memory management, virtual memory, paging, segmentation. File systems, disk management. Input/output devices management.			
Assessment	Written Final examination 100-70% Coursework 0-30%			
Textbooks	MODERN OPERATING SYSTEMS, A.S. TANENBAUM, Prentice-Hall. OPERATING SYSTEMS, W. STALLINGS, Prentice-Hall. OPERATING SYSTEMS CONCEPTS, Silberschatz, Galvin, Gagne, John Wiley.			
Supplemental material	Instructor's Web Site			

Code	ΠΛ0601	Core	Semester	4
Title	Databases II			
Instructor(s)	Georgios Evangelidis			
Objective	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.			
Content	DBMS Architecture Storing Data: Disks and Files File Structures and Indexes Tree Indexes Hash-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%			
Textbooks	Database System Implementation, Vol. 2 GARCIA-MOLINA, ULLMAN, WIDOM Fundamentals of Databases, Vol. 2 Elmasri Ramez, Navathe Shamkant B.			
Supplemental material	Instructor's Notes			

Code	ΠΛ0419	Core	Semester	4
Title	Computer Graphics & Virtual Reality			
Instructor(s)	Athanasios Manitsaris (50%), Ioannis Mavridis (50%)			
Objective				
Content				
Assessment				
Textbooks				
Supplemental material				

Code ΠΛ0403-2 Core **Semester** 4

Title Macroeconomic Models & Polices

Instructor(s) Nikolaos Dritsakis

Objective 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.

Content

1. OBJECTIVE OF MACROECONOMICS AND NATIONAL ACCOUNTS
 - 1.1 Objective 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

	<p>The paradox of thrift</p> <p>7. PUBLIC POLICY AND PUBLIC DEBT Definition and Problems of Public Policy Public deficit and debt Should the budget be balanced every year</p> <p>8. MONEY Money supply function Money demand function</p> <p>9. KEYNESIANISM AND MONETARISM Introduction Modern money theory (monetarism) Money demand function</p>
Assessment	<p>Exams will take place on the Lecture Rooms. Students must report that they will take part on the examination. The duration of the examination is 2 hours. An exercise and theoretical questions are given to the students. Also, there will be a mid-term examination which is optional and an assignment is given which should be handed out in the last lecture.</p>
Textbooks	<p>TEXTS:</p> <ul style="list-style-type: none"> - Απέργης Νικόλαος (2005). Σύγχρονη Μακροοικονομική, Εκδόσεις Rosoli. - Δημέλη Σοφία (2010). Μακροοικονομικά Μεγέθη και Ανάπτυξη της Ελληνικής Οικονομίας, Εκδόσεις ΟΠΑ, Αθήνα. - Παναγιώτου Ευάγγελος (2004). Μακροοικονομική Ανάλυση, Εκδόσεις Τσαχουρίδης Ιωάννης (Εκδόσεις Γράφημα). - Χατζηνικολάου Δημήτριος (2011). Εισαγωγή στη Μακροοικονομική Με Στοιχεία από την Ελληνική Οικονομία, Εκδότης Κιόρογλου Λαμπρινή, Ιωάννινα. - Mankiw G. (2002). Μακροοικονομική Θεωρία, αναθεωρημένη έκδοση. Εκδόσεις Gutenberg. - Stiglitz, J. & Walsh, C. (2009). Αρχές της Μακροοικονομίας, Εκδόσεις Παπαζήση, Αθήνα. - Blanchard, O. (2006). Μακροοικονομική, Εκδόσεις Επίκεντρο, Θεσσαλονίκη.
Supplemental material	<p>ARTICLES:</p> <ul style="list-style-type: none"> - Hondroyannis, G. (2000). The wage growth and inflation nexus in a dynamic multivariate context: New evidence from Greece. <i>International Economic Journal</i>, Vol.17, No.1, pp. 121 - 138. - Pereira A., and Xu, Z., (2000). Export growth and domestic performance, <i>Review of International Economics</i>, Vol.8, pp. 60 - 73. - Ghirmay T., Grabowski R. and Sharma S. C. (2001). Exports, investment, efficiency and economic growth in LDC: an empirical investigation. <i>Applied Economics</i>, Vol. 33, pp. 689 - 700. - Dritsakis, E. N. (2003). Hungarian macroeconomic variables - reflections on causal relationships. <i>Acta Oeconomica</i>, Vol. 53, No.1, pp. 61 - 73. - Dritsakis, E. N. (2004). Exports, investment and economic development of pre-accession countries of European Union: An empirical investigation of Bulgaria and Romania. <i>Applied Economics</i>, Vol. 36, No.16, pp. 1825 - 1832. - Dritsakis, E. N. (2005). Macroeconomic variables analysis in Ukraine: An empirical approach with cointegration method. <i>American Journal of Applied Sciences</i>, Vol. 2, No. 4, pp. 836 - 842. - Dritsakis N. (2007). "Labour Productivity, Wages and Unemployment: An empirical investigation for Greece using Causality Analysis", <i>Asian - African Journal of Economics and Econometrics</i>, Vol 7, No1, pp 133-145. - Dritsaki, C. and Dritsakis, N. (2009). "Okun's Coefficient for four Mediterranean member countries of EU: An empirical study ", <i>International Journal of Business and Management</i>, Vol 4, No. 5, pp. 18-26.

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- Dritsakis, N. (2011). "Demand for Money in Hungary: An ARDL Approach", Review of Economics and Finance, Vol 1, No. 5, pp. 1-16.
- Dritsakis, N. (2012). "Structural Breaks, Cointegration and the Demand for Money in Greece", The IUP Journal of Applied Economics, Vol. XI, No.3, pp 1-17.

Code	ΠΛ0503-2	Core	Semester	5
Title	Computer Networks			
Instructor(s)	Panayotis Fouliras			
Objective	Introduction to Computer Networks and Programming Network Applications.			
Content	Introduction. Computer Networks, Internet, Information communication media, Technologies, Topologies and cases of Networks and Services. LAN, MAN, WAN. Reference Models (ISO OSI 7-layer and Internet 5-layer). Basic Routing Protocols and Algorithms (Link-State and Distance Vector). IP, TCP, UDP. Design and Programming Network Applications using a simple API(e.g., CNA API). Specific Examples and Exercises (Echo, Chat and Web Server). A first experience with Network Simulators and Network Traffic Analyzers.			
Assessment	Written Exam 90% Mandatory Assignment 10%			
Textbooks	1a. " Computer Networks and Internets", 4th έκδοση, Douglas E. Comer, Prentice Hall, 2007 1b. "Computer Networks. A practical Approach", P. Fouliras, Zygos, 2009 2. " Computer Networking: A Top-Down Approach", 4th Edition, J. Kurose & K. Ross, M., 2008 3. "Computer Networks", 5th Edition, Andrew S. Tanenbaum, Prentice Hall PTR, 2010			
Supplemental material				

Code	ΠΛ0520	Core	Semester	5
Title	Multimedia Technologies and Communications			
Instructor(s)	Athanasios Manitsaris (50%), Christos Georgiadis (50%)			
Objective	<p>After the completion of this course, the students will be capable to:</p> <ul style="list-style-type: none"> - analyze and study various multimedia technologies - discuss and describe specialized topics of multimedia communications <p>as well as to point the use of those concepts on developing, assessing, and evaluating multimedia applications.</p>			
Content	<ul style="list-style-type: none"> - 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») 			
Assessment	<p>Exams 100-70%</p> <p>Project 0 - 30%</p>			
Textbooks	<ul style="list-style-type: none"> - Τεχνολογία πολυμέσων θεωρία και πράξη (Συγγραφέας: Δημητριάδης Σταύρος, Πομπόρτζης Ανδρέας) - Τεχνολογία πολυμέσων και πολυμεσικές επικοινωνίες (Συγγραφέας: Γεώργιος Β. Ξυλωμένος, Γεώργιος Κ. Πολύζος) 			
Supplemental material				

Code	ΠΛ0521	Core	Semester	5
Title	E-Commerce Technology			
Instructor(s)	Christos Georgiadis			
Objective	To be able to: (a) understand current technologies in Web-based applications; (b) gain an understanding of how to identify the typical requirements of e-commerce applications; (c) design and develop small-scale Web-based and e-commerce applications.			
Content	<p>Lectures:</p> <ul style="list-style-type: none"> - e-Architectures, Web & e-commerce applications - mobile e-commerce, mobile devices & Web - e-Payments and e-commerce security - Usability and Accessibility, Personalization and Recommendation Systems <p>Lab:</p> <p>The Visual Studio integrated development environment (IDE) - Developing Web-based applications & e-commerce sites (Visual Basic, ADO.NET, ASP.NET, C#)</p> <ul style="list-style-type: none"> - 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	Exams (lab) 70% Project 30%			
Textbooks	<p>1. ΤΕΧΝΟΛΟΓΙΕΣ ΔΙΑΔΙΚΤΥΟΥ ΚΑΙ ΗΛΕΚΤΡΟΝΙΚΟ ΕΜΠΟΡΙΟ: ΘΕΩΡΗΤΙΚΗ ΚΑΙ ΠΡΑΚΤΙΚΗ ΠΡΟΣΕΓΓΙΣΗ, Ν. Ν. Καρανικόλας, ΕΚΔΟΣΕΙΣ ΝΕΩΝ ΤΕΧΝΟΛΟΓΙΩΝ, Αθήνα 2007</p> <p>2. MICROSOFT VISUAL BASIC 2008, ΒΗΜΑ ΒΗΜΑ, Μ. Halvorson, ΚΛΕΙΔΑΡΙΘΜΟΣ, Αθήνα 2008</p> <p>3. ΚΑΤΑΝΕΜΗΜΕΝΕΣ ΕΦΑΡΜΟΓΕΣ ΚΑΙ ΗΛΕΚΤΡΟΝΙΚΟ ΕΜΠΟΡΙΟ, D. Ince, ΠΑΝΕΠΙΣΤΗΜΙΟ ΜΑΚΕΔΟΝΙΑΣ, ΘΕΣΣΑΛΟΝΙΚΗ 2007</p> <p>4. e-Επιχειρηματικότητα: από την ιδέα στην υλοποίηση, Κ. Μάρκελλος κ.ά., ΕΛΛΗΝΙΚΑ ΓΡΑΜΜΑΤΑ, ΑΘΗΝΑ 2005</p>			
Supplemental material				

Code	ΠΛ0114	Core	Semester	5
Title	Marketing Information Systems			
Instructor(s)	Maro Vlachopoulou			
Objective	<p>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.</p> <p>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.</p>			
Content	<p>Conceptual framework of E-marketing. Marketing Information Systems (MAIS), Internet marketing, online/digital marketing, mobile marketing, e- vs. traditional marketing, marketing applications.</p> <p>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.).</p> <p>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.</p> <p>Case Studies.</p>			
Assessment	<p>essay (a literature review and empirical research paper) 30%</p> <p>case study (presentation and writing) 20%</p> <p>final examination 50%</p>			
Textbooks	Maro Vlachopoulou (2003), "e- Marketing - Internet Marketing", ISBN960-7745-04-3, Rosili ed., Athens			
Supplemental material	(Students will access literature references and all other course materials online)			

Code	ΠΛ0504	Core	Semester	5
Title	Econometrics I			
Instructor(s)	Nikolaos Dritsakis			
Objective	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.			
Content	<ol style="list-style-type: none"> 1. Simple Regression <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 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 <ol style="list-style-type: none"> 4.1 Introduction 4.2 Multicollinearity 4.3 Specification Errors 			
Assessment	This unit is assessed in the laboratory or in the class where students are divided into groups confirming their participation in the exams (There is an exercise using E-Views software package and a topic of theory. The duration of examination is two hours).			
Textbooks	<ul style="list-style-type: none"> - Βάμβουκας. Α. Γ (2007). Σύγχρονη Οικονομετρία. Ανάλυση και Εφαρμογές. Αθήνα, Εκδόσεις Οικονομικού Πανεπιστημίου Αθηνών. - Τζαβαλής. Η. (2008). Οικονομετρία, Αθήνα, Έκδόσεις Οικονομικού Πανεπιστημίου Αθηνών. - Gujarati D. N. (2003). Basic Econometrics, New York, Mc Grow-Hill. 			

Code	ΠΛ0803	Core	Semester	5
Title	Computerized Accounting			
Instructor(s)	Athanasios Vazakidis (50%), Antonios Stavropoulos (50%)			
Objective	<p>This course is aiming to:</p> <p>Enable students aware of the general accepted accounting principles (G.A.A.P.).</p> <p>Enable students aware of the content and the way by which Greek General Chart of Accounts is operating (classes of accounts 1-8).</p> <p>Enable students capable of posting entries in accounting books by using computers' software.</p> <p>Enable students aware of posting entries in relation to the opening and closing of the accounting books.</p> <p>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.</p> <p>Enable students capable of reporting the basic financial statements such as the balance sheet and the income statement.</p>			
Content	<p>Greek 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.</p>			
Assessment	Laboratory exams 100%			
Textbooks	<ol style="list-style-type: none"> 1. Vazakidis, A., Stavropoulos, A., Chatzis, A. (2011), National general chart of accounts - and accounting computerization, Edition 2nd, Thessaloniki, Greece. 2. Ginoglou, D., Taxinakis, P., Protogeros, N. (2004), Accounting information systems and computerized accounting, Rosili, Edition 1st, Athens. 3. Notes and slides given during the lectures. 			
Supplemental material	<ol style="list-style-type: none"> 1. Karagiannis, D., Karagiannis, I., Karagianni, A. (2011), Application and analysis of Greek general chart of accounts with case studies, Edition 11th, Thessaloniki, Greece. 2. Meigs, W., and Meigs, R. (1998), Accounting the base of corporate decisions, Volumes A' and B', Papazisis, Athens, Greece. 3. Ginoglou, D., Taxinakis, P., Moisi, S. (2005), General financial accounting, Rosili, Athens, Greece. 4. Needles, B., Powers, M., Crosson, S. (2008), Financial and managerial accounting, South Western, USA. 			

Code	ΠΛ0701	Core	Semester	6
Title	Artificial Intelligence			
Instructor(s)	Ioannis Refanidis			
Objective	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.			
Content	<p>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.</p>			
Assessment	<p>Written exams (in the classroom) 100% Optional project up to extra 30%</p>			
Textbooks	<p>Artificial Intelligence, a modern approach (English or Greek) by Stuart Russell and Peter Norvig published by Prentice Hall (International edition, 2009) and Kleidarithmos (Greek edition, 2004) ISBN: 0136042597 (3rd edition, English), 960-209-873-2 (2nd edition, Greek)</p> <p>Artificial Intelligence (Greek only), by Ioannis Vlahavas, Petros Kefalas, Nick Bassiliades, Fotis Kokkoras and Ilias Sakellariou published by University of Macedonia Press, 2011 ISBN: 9789608396647</p>			
Supplemental material				

Code	ΠΛ0408-1	Core	Semester	6
Title	Information Technology Law (I.T. Law)			
Instructor(s)	Eugenia Alexandropoulou			
Objective	The aim of this course is to familiarize the students with the legal framework of personal data protection, including the rules of their electronic processing the contracts for Informatics services.			
Content	<p>Part I Electronic Processing of Personal Data - Legal Framework of Personal Data Protection in Hellas and E.U. / Simple and Sensitive Personal Data/ Rights of Data Subjects- Sanctions/The Data Protection Authority.</p> <p>Part II Contract for Informatics Services: Parties/Content/Legal Nature/Hardware and Software Contracts/Example of a Contract for Informatics Services supplied to a great firm.</p>			
Assessment	Written Final examination 100% Coursework (optional)			
Textbooks	Alexandropoulou, E., Personal data (e-processing), ed. Avt. N. Sakkoula, Athens 2007 Iglezakis, I., Sensitive personal data, ed. Sakkoula, Athens 2003.			
Supplemental material	<p>Alexandropoulou - Aigyptiadou, Ev., 2002, Zetemata apo to Dikaio Pleroforikes (Matters from the I.T. Law), Athens, Ant. N. Sakkoulas, (in greek).</p> <p>Alexandropoulou - Aigyptiadou, Ev., 2008, "Nomike Diasphalise tou Aporetou ton Kineton Epikoinonion" (Legal {protection of the Privacy of Mobile Communications), Dikaio MesonEnemeroses kai Epikoinonias, v. 5, pp. 446-459 (in greek).</p> <p>Armamentos,P.-Sotiropoulos,V., Personal Data, ed. Sakkoula, Athens 2005</p> <p>Lloyd, I., Information Technology Law, 4 ed., 2004</p> <p>Frayssinet,J., La protection des donnees personnelles, Droit de l' informatique et de l' Internet, εκδ. Themis, PUF, Paris 2001</p> <p>Fenoll-Trousseau, M.-P. - Haas,G., Internet et protection des donnees personnelles, εκδ. Litec, Paris 2000</p> <p>Henderson, H., Privacy in the information age, 1999.</p> <p>Lamy, Droit de l'informatique et des reseaux, 2003</p> <p>Lucas,A.-Deveze,J.-Frayssinet,J., Droit de l' Informatique et de l' Internet, ed. Themis, P.U.F., Paris 2001</p> <p>Reed, Chr., Computer law, 1996</p> <p>Smith, Gr. H, Internet law and regulation, 2002</p> <p>Solove, D., Privacy, information, and technology, 2006</p>			

Code	ΠΛ0713-1	Core	Semester	6
Title	Information and Systems Security			
Instructor(s)	Ioannis Mavridis			
Objective	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.			
Content	<p>Introduction (Fundamental concepts, Security breaches, Vulnerabilities, Threats, Control measures, IS security requirements, Privacy protection)</p> <p>Personal Computers Security - Malicious Code (Viruses, Worms, Trojan Horses)</p> <p>Identification and Authentication (Techniques, media, standards, procedures and issues, Implementations in common operating systems)</p> <p>Access Control (Discretionary, Mandatory, Role-based, Extensions and Implementations in common operating systems)</p> <p>IS Security Models and Policies (Clark-Wilson, Harrison-Ruzzo-Ullman, Graham-Denning, Chinese Wall, Bell-La Padula, Biba, High-Level Security Policies).</p> <p>Risk Analysis and Assessment (Theoretical approaches, Application examples, Cramm and Cobra tools)</p> <p>Computer Systems Security Evaluation (TCSEC criteria, ITSEC criteria, Federal criteria (FF), Common Criteria (CC))</p> <p>Database Systems Security (Components and security domains, Implementations in the DBMS of ORACLE)</p> <p>Mobile Computing Systems Security (Mobile computing systems infrastructure configuration, classification of security parameters, security mechanisms and standards)</p>			
Assessment	<p>Written Final examination 100%</p> <p>Optional projects up to extra 30%</p>			
Textbooks	<p>Information Systems and Networks Security (in greek) by G.Pangalos and I.Mavridis Anikoula Publ., 2002 ISBN: 960-516-018-8</p> <p>Information Systems Security (in greek) by S.Katsikas, S.Gritzalis and D.Gritzalis New Technologies Publ., 2004 ISBN: 960-8105-57-9</p>			
Supplemental material	<p>Instructor's Slides and Notes</p> <p>Security in Computing, C.P. Pfleeger, Prentice-Hall Inc., 2006 (4th edition), ISBN-13: 978-0132390774</p> <p>Computer Security, D. Gollmann, John Wiley & Sons, 2006 (2nd edition), ISBN: 0470862939</p>			

Code	ΠΛ0805	Core	Semester	6
Title	Decision Support Systems			
Instructor(s)	Dimitris Hristu-Varsakelis			
Objective	To (a) know the salient features of a Decision Support System (DSS), (b) be able to formulate small-scale decision support models that could serve as the "core" of a DSS, and (c) use a series of techniques and tools from applied mathematics and optimization in order to obtain insight into the original decision problem by exploring the model(s) computationally, or by solving them analytically when possible.			
Content	Basic components of a DSS (DSS categories & structure) How decisions are made (stages of a decision process) Introduction to Decision Theory Decision Trees Multi-criteria decision-making Markov-based models Utility Theory Stochastic processes and estimation problems			
Assessment	Written Final examination 70% Homework 30%			
Textbooks	Instructor's Notes Introduction to Operations Research: Decision-Making via Mathematical Models (in Greek) Fragkos, C., Stamoulis Editions, Athens, 2006. Management Science - Operational Decision Making in the Information Society (in Greek) Prastakos, G., Stamoulis Editions, Athens, 2006.			
Supplemental material				

Code	ΠΛ0709	Core	Semester	6
Title	Econometrics II			
Instructor(s)	Nikolaos Dritsakis			
Objective	<p>Upon completion of this course, students should be able to:</p> <p>(a) Understand the basic principles of Econometrics II</p> <p>(b) Identify the main theories of Econometrics II</p> <p>(c) Apply the methodologies of Econometrics II on real cases</p> <p>(d) Use the tools of Econometrics II in decision - making</p>			
Content	<p>- 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)</p> <p>- 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)</p> <p>- 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)</p> <p>- Simultaneous equation models (simultaneous equations bias, identification, methods of estimation (indirect least squares, two-stages least squares), seemingly unrelated equations, diagnostic tests, model analysis)</p>			
Assessment	<p>Final examination in Laboratory (with Eviews) 70%</p> <p>Final examination in Theory 30%</p>			
Textbooks	Katos, A.V. (2004) Econometrics: Theory and Applications, Thessaloniki: Zygos (in Greek).			
Supplemental material	<p>Katrakylidis, K. and Tambakis, N. (2011) Introduction to Econometrics, Thessaloniki: Zygos (in Greek).</p> <p>Syriopoulos, K. and Filippas, D. Th. (2010) Econometric Models & Applications with Eviews, Thessaloniki: Anikoula (in Greek).</p> <p>Chalkos, G. (2010) Econometrics: Theory, Applications and the Use of Programmes with Computers, Athens: Gutenberg (in Greek).</p>			

Code	ΠΛ0415-1	Core	Semester	6
Title	Teaching Methods I			
Instructor(s)	Despoina Makridou-Bousiou			
Objective	Through their participation in this course students will be able to: a) acquire a general knowledge of the subject of Teaching Methods and become familiar with the basic concepts and skills of this specific cognitive field, b) distinguish among basic teaching approaches, c) develop the ability of planning learning activities, d) develop the ability of selecting and implementing appropriate teaching approaches, e) develop the ability of assessing the effectiveness of various learning activities and f) obtain experience in teaching by participating (as a teacher) and attending experimental micro-teaching sessions.			
Content	Introduction and analysis of the basic concepts of the subject of Teaching Methods - Teaching approaches - Introduction and analysis of the basic concepts of the constructivist Learning theory, of teaching in a cooperative learning environment and of teaching in an open learning environment - Developing skills in organizing learning activities, in setting lesson objectives, in creating a lesson plan, in assessment and evaluation. The course offers examples of lesson plans and of using the computer as a teaching tool. Students will obtain experience in teaching by implementing and attending group micro-teaching sessions.			
Assessment	Students have two options: A) Evaluation of the following learning activities: - Planning and presenting a micro-teaching session 30% - Attending a certain number of courses 5% - A midterm test 50% - An assignment 15% B) Final Exams			
Textbooks	Learning and Teaching Issues Μακρίδου-Μπούσιου Δ., Γιουβανάκης Θ., Σαμαρά Χ. & Ταχματζίδου Κ. Εκδόσεις Πανεπιστημίου Μακεδονίας, 2003 ISBN: 960-87428-5-4 Economic Education, Didactics of Economics (Economic Teaching Methods) Whitehead David J., Μακρίδου-Μπούσιου Δέσποινα Εκδόσεις Gutenberg ISBN: 978-960-01-0601-0			
Supplemental material				

Code ΠΛ0100 Elective **Semester** 7

Title Thesis Project

Instructor(s)

Objective

Content

Assessment

Textbooks

Supplemental material

Code	ΠΛ0825	Elective	Semester	7
Title	Networks and Internet Applications Security			
Instructor(s)	Ioannis Mavridis			
Objective	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.			
Content	<p>Basic concepts (Network and Internet security issues, Types of attacks and countermeasures, Comparison of security technologies)</p> <p>Introduction to Cryptography (Terminology, Types of cryptographic systems and features of their components, Key-stream generators)</p> <p>Classic Cryptographic Algorithms and Cryptanalysis (Caesar, Vigenere, One Time Pad / Vernam, ROT13, Transposition algorithms, Substitution algorithms, Application examples with CRYPTOOL)</p> <p>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)</p> <p>Modern Asymmetric Cryptographic Algorithms and Cryptanalysis (Diffie-Hellman, ECDH, RSA, ECC, Application examples with CRYPTOOL)</p> <p>Integrity Mechanisms (CBC-MAC, HMAC, OWHF, CRHF, MD5, SHA, DSA, ECDSA, etc, Application examples with CRYPTOOL)</p> <p>Applications of Cryptography (message digests, digital signatures, digital certificates, etc)</p> <p>Certification Infrastructures (Components and Features of Public Key Infrastructures - PKIs)</p> <p>Protection of Digital Communications (S/MIME, PGP, Kerberos, SSL/TLS, IPsec, etc)</p> <p>Protocols for Secure Transactions over the Internet (eCash, CAFE, NetCash, CyberCoin, CyberCash, iKP, SET, etc)</p> <p>Wired Network and Web Applications Security (Issues, Critical vulnerabilities, Types of attacks, Case studies)</p> <p>Firewalls and IDSs (Kinds of mechanisms, Architectures, Case studies)</p> <p>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)</p>			
Assessment	Written Final examination 100% Optional projects up to extra 30%			
Textbooks	<p>Information Systems and Networks Security (in greek) by G.Pangalos and I.Mavridis Anikoula Publ., 2002 ISBN: 960-516-018-8</p> <p>Computer Network Security (in greek) by S.Gritzalis, S.Katsikas and D.Gritzalis Papasotiriou Publ., 2003 ISBN: 960-7530-45-4</p>			
Supplemental material	<p>Instructor's Slides and Notes</p> <p>Cryptography and Network Security W. Stallings, Prentice Hall (5e), ISBN-13: 978-0136097044</p>			

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Wireless Communications and Networks,
W. Stallings,
Prentice Hall (2e),
ISBN-13: 978-0131918351

Code ΠΛ0309-2 **Elective** **Semester** 7

Title International Economics

Instructor(s) Eleni Katsouli

Objective 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 - making

Content

- 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

Assessment

Final written examinations 70%

 Essay 30%

 Alternatively

 Two prog examinations 70%

 Essay 30%

Textbooks one of the following:

Pournarakis, E. (2010) International Economics: An Introductory Approach, Athens (in Greek)

Krugman, P.R. (2011) International Economics: Theory and Policy, Athens: Kritiki (in Greek)

Supplemental material Instructor's notes and transparencies

Code	ΠΛ0716	Elective	Semester	7
Title	Teaching Methods II			
Instructor(s)	Despoina Makridou-Bousiou			
Objective	Through their participation in this course students will be able to: a) become familiar with the fundamental learning theories, b) become acquainted with theories of instructional design, c) obtain knowledge that involves modern technologies of information transmission, d) obtain further problem solving skills regarding the implementation of teaching methods related to their discipline, e) acquire school teaching experience and f) gain an awareness and understanding, as future teachers, of the complexity of teaching, explore the dynamics of the teaching field and comprehend the necessity for life-long learning.			
Content	Learning theories - theories of instructional design - education and technology - long distance education - Teaching approaches and their underlying learning theories - Teaching examples and teaching assignments in student subject areas - correlation of teaching methods and teaching tools - Preparatory student teaching courses - Attending a real high-school course and teaching in a authentic high-school environment.			
Assessment	To successfully complete the course of Teaching Methods II, students are required to: A) Submit an essay (both as a hard-copy and in digital form), on a proposed topic. B) Prepare a presentation of an essay. Γ) Attend and evaluate ten (10) different presentations implemented by other students Δ) Attend a high-school course related to their own subject area E) Teach a high-school course related to their own subject area			
Textbooks	<p>Learning and Teaching Issues Μακρίδου-Μπούσιου Δ., Γιουβανάκης Θ., Σαμαρά Χ. & Ταχματζίδου Κ. Εκδόσεις Πανεπιστημίου Μακεδονίας, 2003 ISBN: 960-87428-5-4</p> <p>New trends in Educational Technology Σολομωνίδου Χριστίνα Εκδόσεις Μεταίχμιο ISBN: 978-960-455-046-3</p>			
Supplemental material				

Code	ΠΛ0510	Elective	Semester	7
Title	Special Subjects in Accounting			
Instructor(s)	Athanasios Basakidis, Antonios Stauroopoulos			
Objective	<p>This course is aiming to:</p> <ul style="list-style-type: none"> ? 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. 			
Content	<p>This 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.</p>			
Assessment	Written Final examination 100%			
Textbooks	<ol style="list-style-type: none"> 1. Karagiannis, D., Karagiannis, I., Karagianni, A. (2011), Employees' accounting treatment, payrolls, insurance examples and statements, Edition 15th, Tessonolniki, Greece. 2. Vazakidis, A., Stavropoulos, A. (2009), Labor relationships and value added tax (VAT), University of Macedonia, Thessaloniki, Greece. 3. Notes and slides given during the lectures. 			
Supplemental material	<ol style="list-style-type: none"> 1. Rapanakis, P. (1995), Employees' accounting treatment and insurance topics, Athens, Greece. 2. Lanaras, K. (2004), The employees' insurance by Greek Organization of Social Insurance, Athens, Greece. 			

Code	ΠΛ0605	Elective	Semester	7
Title	Human - Computer Interaction			
Instructor(s)	Athanasios Manitsaris (33%), Ioannis Mavridis (33%), Christos Georgiadis (33%)			
Objective	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.			
Content	<p>Introduction (Basic concepts, The importance of user interface)</p> <p>Theoretical foundation (Cognitive models, Sensory perception, Attention and Memory, Knowledge organization)</p> <p>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)</p> <p>Analysis and design of interactive systems (User-oriented Methods, HTA, GOMS)</p> <p>Usability rules</p> <p>Design guidelines</p> <p>Development of interactive systems (state transition diagrams (STD), User Action Notation (UAN))</p> <p>Fast prototyping and related development tools</p> <p>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)</p> <p>Case studies of development and evaluation of interactive systems</p>			
Assessment	<p>Written Final examination 70%</p> <p>Laboratory projects 30%</p>			
Textbooks	<p>one of the following :</p> <p>A. Dix, J. Finlay, G. Abowd, R. Beale, "Human-Computer Interaction" (in greek), M.Gkiourdas Pubs, 2007 (3rd Ed.).</p> <p>Computer Network Security (in greek)</p> <p>N.Avouris, "Introduction to Human-Computer Interaction " (in greek), Diavlos Pubs, 2000.</p>			
Supplemental material	<p>Instructor's Slides and Notes</p> <p>- A. Dix, J. Finlay, G. Abowd, R. Beale, Human-Computer Interaction, Prentice Hall, 2003 (3rd Ed.).</p> <p>- J. Preece et al., Human-Computer Interaction, Addison-Wesley, 1994</p> <p>- D. Hix, H.R.Hartson, Developing User Interfaces, Ensuring Usability Through Product and Process, Wiley Publ., 1993</p> <p>- B. Shneiderman, Designing the User Interface, 3rd edition, Resding MA, Addison Wesley, 1997</p>			

Code	ΠΛ0611-3	Elective	Semester	7
Title	Business Innovation and Productivity			
Instructor(s)	Emmanouil Stiakakis			
Objective	(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.			
Content	Introduction 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).			
Assessment	Compulsory Assignment 100%			
Textbooks	Entrepreneurship & Innovations: Business innovation management, by Zoe Georganta, published by Anikoula, 2003 ISBN: 960-516-022-6 Innovation & Entrepreneurship: Theory - practice, by Elias Karagiannis, published by Sofia S.A., 2010 ISBN: 960-670-633-8			
Supplemental material				

Code	ΠΛ0814-1	Elective	Semester	7
Title	Operations Research			
Instructor(s)	Dimitris Hristu-Varsakelis			
Objective	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.			
Content	Linear vector spaces Optimizing functions of a vector variable Optimization with equality constraints - Langrange multipliers Optimization with inequality constraints - Karush-Kuhn-Tucker theorem Integer programming - Branch & Bound method Computational Optimization Discrete-time dynamical systems - Dynamic Programming			
Assessment	Written Final examination 70% Homework 30%			
Textbooks	Instructor's Notes Introduction to Operations Research: Theory and Exercises (in Greek) Fakinou, D., Oikonomou, A. Symmetria Editions, Athens, 2003. Schaum's Operations Research (in Greek) Bronson, R. Kleidarithmos Editions, Athens, 2010.			
Supplemental material				

Code	ΠΛ0515	Elective	Semester	7
Title	Graph theory			
Instructor(s)	Maria Satratzemi (100%)			
Objective	Basic concepts of graph theory, graph representations and graph algorithms.			
Content	<p>Introduction to the fundamental notions of Graphs and their representations. Connectivity, trees, minimum spanning trees. Shortest paths and corresponding algorithms. Breadth First Search and Depth First Search. Hamilton and Euler paths and cycles. Chinese Postman Problem (CPP). Traveling Salesman Problem (TSP). Graph coloring algorithms. Matching, matching algorithms in bipartite graphs Independent sets, dominating sets and corresponding algorithms. Centers and medians.</p>			
Assessment	<p>Written Examination 100% or Written Examination 70% Compuls Assignments 30%</p>			
Textbooks	<p>Topics in Graph Theory I. Manolopoulos New Technologies Publisher, 1999 960-7235-87-8</p>			
Supplemental material	<p>Web site: http://compus.uom.gr/INF129/index.php</p>			

Code	ΠΛ0722	Elective	Semester	7
Title	Game Theory			
Instructor(s)	Ioannis Refanidis			
Objective	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.			
Content	<p>Game representation. Normal/Strategic form. Extended form. Strategies. Domination and its resolution. Nash equilibrium. Cournot duopoly. Cartels. The commons tragedy. Mixed strategies. Expected utility. Risk aversion. Games with non-concurrent actions. Backward induction. Perfect Nash equilibrium for subgames. Repeated games. Finite and infinite games. Firing strategies. Lenient strategies. The common theorem. Dynamic games. Moral hazard. Incentives theories. Games with incomplete information. Bayes-Nash equilibrium. Mechanism design. Revelation principle. Auctions.</p>			
Assessment	<p>Written exams (in classroom) 100% Optional homework up to 30%</p>			
Textbooks	<p>An Introduction to Game Theory by Martin J. Osborne Oxford University Press, 2003 ISBN: 0195128958</p> <p>Game Theory (in Greek) By Ioannis Varoufakis Gutenberg publishers, 2007. ISBN: 9789600111347</p>			
Supplemental material				

Code	ΠΛ0506-1	Elective	Semester	7
Title	Computation Theory and Automata			
Instructor(s)	Ioannis Refanidis			
Objective	To be able (a) to recognize abstract models of computation? (b) to identify various classes of computational problems? (c) to formally describe problems.			
Content	Alphabets and languages. Regular expressions. Regular languages. Non-regular languages. Context-free grammars. Context-sensitive grammars. Automata. Finite automata. Deterministic and non-deterministic automata. Push-down automata. Turing machines. Church thesis. Turing decidable and acceptable languages. Universal Turing machine. Non-computability. Non-solvable problems.			
Assessment	Written exams (in classroom) 100% Optional homework up to 30%			
Textbooks	Elements of the Theory of Computation (2nd Edition) by Harry Lewis and Christos Papadimitriou Prentice-Hall, 1997. ISBN: 978-0132624787 Introduction to the Theory of Computation (2nd edition) by Michael Sipser Course Technology, 2005 ISBN: 978-0534950972			
Supplemental material				

Code	ΠΛ0618	Elective	Semester	7
Title	Cryptography			
Instructor(s)	George Stephanides			
Objective	Introduction to modern cryptology.			
Content	Classical cryptography - simple cryptosystems. Cryptanalysis. Cryptographic hash functions. Symmetric cryptography. Asymmetric cryptography. Key management. Digital signatures. Cryptographic protocols.			
Assessment	Exercises - Oral examination			
Textbooks	one of the following : 1. Τεχνικές Κρυπτογραφίας & Κρυπτανάλυσης, Β. Κάτος, Γ. Στεφανίδης, Εκδ. ΖΥΓΟΣ, 2003 2. Κρυπτογραφία, Δ. Πουλάκης, Εκδ. ΖΗΤΗ, 2004 3. Κρυπτογραφία για Ασφάλεια Δικτύων - Αρχές και Εφαρμογές, W. Stallings, Εκδ. ΙΩΝ 2011.			
Supplemental material	Instructor's Notes - slides.			

Code	ΠΛ0705-1	Elective	Semester	7
Title	Parallel Processing			
Instructor(s)	Konstantinos Margaritis			
Objective	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. Programming in OpenMP and MPI, using Eclipse PTP for visualization and performance evaluation.			
Content	<p>Introduction to Parallel Processing</p> <p>Shared and Distributed Memory Parallel Systems Architecture.</p> <p>Data and Functional Parallelism.</p> <p>Data Partitioning.</p> <p>Load Balancing.</p> <p>Process Communication.</p> <p>Synchronous Parallelism.</p> <p>Replicated Workers.</p> <p>Distributed Termination Detection.</p>			
Assessment	<p>Project and Oral examination 50%</p> <p>Coursework 50%</p>			
Textbooks	<p>Introduction to Parallel Programming, Wilkinson, Allen, Prentice-Hall.</p> <p>Parallel Programming in C with MPI and OpenMP, Quinn, McGraw-Hill.</p>			
Supplemental material	Instructor's Web Site			

Code	ΠΛ0725	Elective	Semester	7
Title	Internet Law			
Instructor(s)	Eugenia Alexandropoulou			
Objective	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.			
Content	The content concentrates on: the basic legal framework related to e-communications and more specifically to the Internet ; the confidentiality of e-communications; personal data protection in e-communications; legal issues concerning blogs and social networks; domain names; copyright and the Internet; e-crime.			
Assessment	Written final exams 100%. An optional presentation in the form of a short-essay provides an opportunity to improve grades.			
Textbooks	one of the following : Sidiropoulos, Th., The Law of the Internet, 2nd ed., ed. Sakkoula, Thessaloniki 2008 (in greek) Karakostas, I., Law and Internet, 3rd ed., ed. P.N.Sakkoula, Athens 2009 (in greek)			
Supplemental material	Reed Chr., Internet Law, 2nd ed., Cambridge University Press 2004 Lucas, A., Deveze, J., Frayssinet, J., Droit de l' Informatique et de l' Internet, P.U.F., Paris 2001 Alexandropoulou, E., Copyright and Information Technology, ed. Themis-N.A. Sakkoula, Athens 2012 (in greek) Alexandropoulou, E., The Protection of Privacy in Mobile Communications (The Greek Regulatory Framework), R.H.D.I. 64(2011) pp. 425-435 Alexandropoulou, E., Minors' Internet Navigation and Personal Data Protection, Armenopoulos 2007 pp 848-854 (in greek)			

Code	ΠΛ0726	Elective	Semester	7
Title	Educational Programming Environments and languages			
Instructor(s)	Maria Satratzemi (100%)			
Objective	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.			
Content	Synopsis 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			
Assessment	project work (one research and one case study)			
Textbooks	one of the following : Educational Programming Environments and languages, M. Satratzemi, Notes (in Greek), 2012. Object-oriented programming: Didactic problems and educational programming environments, M. Satratzemi, SOFIA, 2008. Reflections on the Teaching of Programming, methods and implementations, Jen Renedsen, Michael Caspersen, Michael Kolling, Springer-Verlag, LNVS 4821, 2008.			
Supplemental material	Notes, papers from conferences (ITiCSE, SIGCSE κτλ), journals (Computers & education, computer science education, Interactive environment Web site: http://compus.uom.gr/INF252/index.php			

Code	ΠΛ0727	Elective	Semester	7
Title	Statistical Image Procecing - Computer Vision			
Instructor(s)	Athanasios Manitsaris			
Objective				
Content				
Assessment				
Textbooks				
Supplemental material				

Code	ΠΛ0728	Elective	Semester	7
Title	Computational Economics			
Instructor(s)	George Stephanides			
Objective	The student is introduced to the basic computational techniques of economic models that cannot be solved using the standard mathematical techniques of linear Algebra and Calculus.			
Content	<p>Introduction - mathematical background.</p> <p>Numerical solution of linear systems - non-linear equations.</p> <p>Finite-Dimensional Optimization.</p> <p>Numerical Integration and Differentiation.</p> <p>Function Approximation.</p> <p>Discrete State Models.</p> <p>Continuous State Models - Theory, methods and examples.</p>			
Assessment	Homework - Oral examinations.			
Textbooks	Instructor's notes.			
Supplemental material	<p>Applied Computational Economics and Finance</p> <p>M. Miranda and P. Fackler</p> <p>The MIT Press, 2002.</p>			

Code	ΠΛ0729	Elective	Semester	7
Title	Web Services & Transactions			
Instructor(s)	Christos Georgiadis			
Objective	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.			
Content	Service-Oriented Architecture (SOA): Interoperability, Services, Loose Coupling XML markup language and Messaging Framework: SOAP, WS Addressing Describing and Discovering Metadata: WSDL, WS Policy, UDDI Quality of Service - Transactions: Reliable Messaging, Classic and Business Transactions Quality of Service - WS Security: Trust, WS Authorization, Security Policy Service Composition: Modeling Business Processes: BPEL, case studies			
Assessment	Exams 70% Project 30%			
Textbooks	one of the following : Web Services Platform Architecture, S. WEERAWARANA ET AL., ΚΛΕΙΔΑΡΙΘΜΟΣ, ΑΘΗΝΑ 2008 ΥΠΗΡΕΣΙΕΣ ΠΑΓΚΟΣΜΙΟΥ ΙΣΤΟΥ ΚΑΙ ΥΠΗΡΕΣΙΟΣΤΡΕΦΕΙΣ ΑΡΧΙΤΕΚΤΟΝΙΚΕΣ, ΘΕΜΙΣΤΟΚΛΕΟΥΣ Μ., ΜΑΝΤΖΑΝΑ Β., Εκδόσεις ΒΑΣΙΛΙΚΗ ΜΑΝΤΖΑΝΑ, 2010			
Supplemental material	Do more with SOA Integration: Best of Packt, A. Poduval, D. Todd, et al., Packt Publishing, 2011			

Code	ΠΛ0608	Elective	Semester	8
Title	Money and Capital Markets			
Instructor(s)	Stauros Tsopoglou			
Objective	<p>The content of the course "Money and Capital Markets is:</p> <ol style="list-style-type: none"> 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) 			
Content				
Assessment				
Textbooks	<ol style="list-style-type: none"> 1. «ΒΑΣΙΚΕΣ ΑΡΧΕΣ ΤΗΣ ΧΡΗΜΑΤΟΟΙΚΟΝΟΜΙΚΗΣ ΔΙΑΧΕΙΡΙΣΗΣ ΚΑΙ ΠΟΛΙΤΙΚΗΣ», BRINGHAM F., WESTON J. FRED ΕΚΔΟΣΕΙΣ ΠΑΠΑΖΗΣΗ ΑΕΒΕ, ΑΘΗΝΑ 1986 2. «ΧΡΗΜΑΤΟΟΙΚΟΝΟΜΙΚΗ ΑΝΑΛΥΣΗ ΕΠΙΧΕΙΡΗΣΕΩΝ» ΞΑΝΘΑΚΗΣ ΜΑΝΩΛΗΣ, ΑΛΕΞΑΚΗΣ ΧΡΗΣΤΟΣ ΕΚΔΟΣΕΙΣ ΣΤΑΜΟΥΛΗ ΑΕ ΑΘΗΝΑ, 2007 			
Supplemental material	<ol style="list-style-type: none"> 1. «ΛΟΓΙΣΤΙΚΗ Η ΒΑΣΗ ΤΩΝ ΕΠΙΧΕΙΡΗΜΑΤΙΚΩΝ ΑΠΟΦΑΣΕΩΝ» MEIGS, F.R. Εκδ. Παπαζήση, Αθήνα, 1988 (Μετάφραση από αγγλικά) 2. «FINANCIAL MANAGEMENT AND POLICY» VAN HORNE J.C Prentice Hall, New York, 1992 3. Χρήση και Εφαρμογές του Excel στην Οικονομία και τη Διοίκηση» Α. Οικονομίδης, Β. Καρατζόγλου, Θ. Χατζιδάκη Πανεπιστήμιο Μακεδονίας, Θεσσαλονίκη, 2011 4. Οποιοσδήποτε οδηγός χρήσης Λογιστικών Φύλλων (Spreadsheets) τύπου Excel 			

Code	ΠΛ0610-2	Elective	Semester	8
Title	Computer Networks Deployment and Management			
Instructor(s)	Panagiotis Fouliras			
Objective	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.			
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	Project work involving programming.			
Textbooks	one of the following : "Δίκτυα Υπολογιστών. Μία Πρακτική Προσέγγιση", Π. Φουληράς, Ζυγός, 2009 "Δίκτυα & Διαδίκτυα Υπολογιστών", 4η έκδοση, Douglas E. Comer, Κλειδάριθμος, 2007			
Supplemental material	Network monitoring and simulation tools, papers, etc.			

Code	ΠΛ0827	Elective	Semester	8
Title	Programming Languages and Compilers			
Instructor(s)	Ilias Sakellariou			
Objective	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.			
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	Written Final examination 100% Optional Coursework 20%			
Textbooks	<p>Programming Language Pragmatics, (In greek and in English) Michael L. Scott, 2 edition (ISBN:978-0126339512), Morgan Kaufmann, 2005 (3rd edition in English only)</p> <p>Μεταγλωττιστές (In greek) N.Παπασπύρου και Σκορδαλάκης Ε., Εκδόσεις Συμμετρία, 2002, ISBN 960-266-135-6</p> <p>Μεταγλωττιστές Γλωσσών Προγραμματισμού, Θεωρία και Πράξη, (In greek) Κ. Λαζος, Κατσαρός, Καραϊσκος, 2004 (3η έκδοση) ISBN: 960-87723-4-6.</p> <p>Compilers: Principles, Techniques, and Tools (International Edition) Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, 2/E, Addison-Wesley 2007, ISBN-10: 0321491696, ISBN-13: 9780321491695</p>			
Supplemental material				

Code	ΠΛ0807	Elective	Semester	8
Title	Electronic Commerce			
Instructor(s)	Maro Vlachopoulou			
Objective	<p>This course introduces students to:</p> <p>a) the strategy, application and implementation of Electronic Commerce (EC) /E-Business (EB) and mobile commerce/business- Technology, business, and market aspects</p> <p>b) practical approaches to implementing an EC/ EB and mobile commerce/business strategy. Case studies - best practices - business / industry applications.</p>			
Content	<p>E-Commerce /E-Business Strategy and applications. Business process integration and E-Business plan.</p> <p>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.</p> <p>E- M- Business Models (Business innovation), e-shops, e-auctions, e-marketplaces, portals, dynamic pricing models, affiliate marketing, viral marketing models, e.t.c...</p> <p>E- M- Business Applications: e/m-Health, learning, banking, tourism, etc business/ industry sectors.</p> <p>The extended enterprise, synergies, networks' development and management, e-supply chain management, Virtual organizations/enterprises, social networks.</p> <p>E/M-Business plan strategy and development, The strategy of Web site- shop - portal (e-business model) development, evaluation and management. Case Studies.</p>			
Assessment	<p>essay (a literature review and empirical research paper) 60%</p> <p>case study (presentation and writing) 40%</p>			
Textbooks	<p>D. Chaffey, 2011, E-Business and E-commerce Management, Publisher: Financial Times/ Prentice Hall; 5 edition (14 July 2011)</p> <p>E. Turban, D. King, J.Lee, D. Viehland (2008, Pearson, Prentice Hall), E-commerce, Ηλεκτρονικό Εμπόριο (Αρχές - Εξελίξεις- Στρατηγική από τη σκοπιά του Manager) , Ελληνική Μετάφραση, εκδόσεις Γκιούρδας</p> <p>Maro Vlachopoulou (2003), «e- Marketing - Internet Marketing", ISBN960-7745-04-3, Rosili ed., Athens</p> <p>compus online material: Students will access literature references and all other course materials online</p>			
Supplemental material				

Code	ΠΛ0416	Elective	Semester	8
Title	Production Management			
Instructor(s)	Emmanouil Stiakakis			
Objective	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.			
Content	<p>The function of production - Relationship to the other business functions - Differences between manufacturing firms and firms providing services,</p> <p>The use of information technologies in the production process - Computer Aided Design and Computer Aided Manufacturing - Flexible Manufacturing Systems - Computer Integrated Manufacturing - Robotics,</p> <p>Demand and Capacity - Demand forecasting - Evaluation of forecasts - Facing the variations of demand,</p> <p>Plant layout - Material handling methods - Minimizing the material handling cost - Computer aided layout design,</p> <p>Production planning and control - Determining the size of production lots - Work allocation to productive means - Manufacturing execution planning,</p> <p>Material Requirements Planning - Manufacturing Resources Planning - Just in Time - Kanban - Optimized Production Technology.</p>			
Assessment	Written examination			
Textbooks	<p>one of the following :</p> <p>Διοίκηση Παραγωγής, Ο σχεδιασμός παραγωγικών συστημάτων Κ. Παππής Σταμούλης, Αθήνα, 2008, ISBN: 978-960-351-746-7</p> <p>Διοίκηση Παραγωγικών Συστημάτων, Βασικές θεωρητικές αρχές και εφαρμογές στη λήψη επιχειρηματικών αποφάσεων Σ. Δημητριάδης, Α. Μιχιώτης Κριτική, Αθήνα, 2007, ISBN: 978-960-218-522-3</p>			
Supplemental material	<p>Διοίκηση Συστημάτων Παραγωγής Λ. Λιαρμακόπουλος Αγραφιώτου Χρυσούλα, Αθήνα, 2010, ISBN: 960-91327-0-7</p> <p>Διοίκηση Παραγωγής, Βασικές αρχές του προγραμματισμού και της ρύθμισης παραγωγής S. Kiener, N. Maier-Scheubeck, R. Obermaier, M. Weib Προπομπός, Αθήνα, 2011, ISBN: 978-960-7860-88-0</p>			

Code	ΠΛ0311-1	Elective	Semester	8
Title	Special Topics in Computational Mathematics			
Instructor(s)	Dimitrios Hristu-Varsakelis			
Objective	The course will provide a concise introduction to mathematical finance and the valuation of financial derivatives. We will discuss one of the fundamental and most well-known models in the literature, leading to the Black-Scholes equation, as well as its computational solution.			
Content	<p>Introduction to mathematical finance. What are derivatives. Introduction to options. Random variables and simulation. Changes in asset prices. A basic asset pricing model. The Black-Scholes partial differential equation. Hedging Risk neutrality Binomial trees The Monte Carlo method The finite difference method for solving partial differential equations.</p>			
Assessment	Homework sets which will be assigned during the semester (30%) and a written final exam (70%). The homework grade will count towards the final grade only if the student achieves a grade of 5/10 or better in the final exam.			
Textbooks	<p>one of the following :</p> <p>Στοιχειώδης Εισαγωγή Στα Χρηματοοικονομικά Μαθηματικά S. Ross Εκδόσεις Πανεπιστημίου Μακεδονίας, Θεσσαλονίκη, 2007.</p> <p>Χρηματοοικονομικά Μαθηματικά Α. Ζυμπίδης Εκδόσεις Πανεπιστημίου Μακεδονίας, Θεσσαλονίκη, 2010.</p>			
Supplemental material	<p>D. Higham, "An introduction to financial option valuation". Cambridge University Press, 2004.</p> <p>J. Hull, "Options, Futures and Other Derivatives", 6th ed., Wiley, 2006.</p> <p>Παπούλιας, Γ., «Παράγωγα=Derivatives», Αθήνα, 1998.</p>			

Code	ΠΛ0815	Elective	Semester	8
Title	Special Topics in Econometrics			
Instructor(s)	Nikolaos Dritsakis			
Objective	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.			
Content	Stationarity Introduction Basic Meanings (Time series data, Stochastic Procedure, White noise, Random walk, Stochastic and Deterministic trend, Integrated time series) Spurious regressions Time series stationarity Stationarity tests (Graphs) Autocorrelation coefficients Unit Roots Unit Root Tests Dickey - Fuller (DF) test Augmented Dickey - Fuller (ADF) tests Selection of number time lags Phillips-Perron tests Cointegration Definitions Cointegration tests Engel - Granger tests Johansen tests Error Correction Models Estimation of error correction model Causality Definition Granger causality test			
Assessment	On successful completion of the unit, students should submit the assignment and deliver it on the day defined by the professor. The assignments should use the software package taught during the semester and require economic, research and calculating context. Also, a hard copy as well as an electronic form of the assignment is required. An oral examination and discussion will be held where students will be evaluated for their assignments by the professors.			
Textbooks	Βάμβουκας. Α. Γ (2007). Σύγχρονη Οικονομετρία. Ανάλυση και Εφαρμογές. Αθήνα, Εκδόσεις Οικονομικού Πανεπιστημίου Αθηνών. Δημέλη. Σ. (2002). Σύγχρονες Μέθοδοι Ανάλυσης Χρονολογικών Σειρών, Αθήνα, Κριτική. Κάτος Α. Β. (2004). Οικονομετρία: Θεωρία και Εφαρμογές. Θεσσαλονίκη, Ζυγός. Χρήστου, Κ.Γ. (2002). Εισαγωγή στην Οικονομετρία. Αθήνα. Gutenberg. Brooks C. (2002). Introductory Econometrics for Finance, Cambridge University Press. Gujarati D. N. (2003). Basic Econometrics, New York, Mc Grow-Hill. Hamilton, J. D. (1994). Time Series Analysis, New Jersey, Princeton University Press. Johnston, J and J. Dinardo (1997). Econometric Methods. New York, McGraw-Hill. Maddala G.S. (1992). Introductory Econometrics, New Jersey, Prentice-Hall. Myers R. (1990). Classical and Modern Regression with Applications, Belmont California, Duxbury Press. Myers R., Montgomery D., Vining G. (2002). Generalized Linear Models, New York, John Wiley. Thomas R.L. (1997). Modern Econometrics: An Introduction. Harlow, Addison-Wesley.			

Supplemental material

- Chang, T. (2002). Financial development and economic growth in Mainland China: A note on testing demand-following or supply-leading hypothesis. *Applied Economic Letters*, Vol. 9, pp. 869 - 873.
- Dritsakis, E. N. (2003). Hungarian macroeconomic variables - reflections on causal relationships. *Acta Oeconomica*, Vol. 53, No.1, pp. 61 - 73.
- Dritsakis, E. N. (2003). Forecasting of cigarettes consumption in Greece: An empirical investigation with cointegration analysis. *Agricultural Economic Review*, Vol. 4, No. 2, pp. 47 - 56.
- Dritsakis, E. N. (2004). Exports, investment and economic development of pre-accession countries of European Union: An empirical investigation of Bulgaria and Romania. *Applied Economics*, Vol. 36, No.16, pp. 1825 - 1832.
- Dritsakis, E. N. (2004). Defense spending and economic growth: An empirical investigation for Greece and Turkey. *Journal of Policy Modeling*, Vol. 26, pp. 249 - 264.
- Dritsakis, E. N. (2004). Cointegration analysis of German and British tourism demand for Greece. *Tourism Management*, Vol. 25, pp. 111 - 119.
- Dritsakis, E. N. (2005). Macroeconomic variables analysis in Ukraine: An empirical approach with cointegration method. *American Journal of Applied Sciences*, Vol. 2, No. 4, pp. 836 - 842.
- Dritsakis N, Grose Ch, and L. Kalyvas (2006). Performance aspects of Greek bond mutual funds. *International Review of Financial Analysis*, Vol.15, No.2 pp. 189 - 202.
- Dritsakis N. (2007). "Labour Productivity, Wages and Unemployment: An empirical investigation for Greece using Causality Analysis", *Asian - African Journal of Economics and Econometrics*, Vol 7, No1, pp 133-145.
- Dritsakis, N. (2008). "Immigration and Economic Growth: Further Evidence for Greece", *Applied Economics and Policy Analysis*, Vol 2, No. 1-2, pp. 207-213.
- Dritsaki, C. and Dritsakis, N. (2009). "Okun's Coefficient for four Mediterranean member countries of EU: An empirical study ", *International Journal of Business and Management*, Vol 4, No. 5, pp. 18-26.
- Dritsakis, N., and A. Gkanas (2010). "The effect of socio-economic determinants on crime rates: An empirical research in the case of Greece with cointegration analysis", *International Journal of Economic Sciences and Applied Research*, Vol 2, No. 2, pp. 51-64.
- Gerdtham, U.G. and Lothgren M. (2000). On stationarity and cointegration of international health expenditure and GDP. *Journal of Health Economics*, Vol.19, pp. 461 - 475.
- Ghirmay T., Grabowski R. and Sharma S. C. (2001). Exports, investment, efficiency and economic growth in LDC: an empirical investigation. *Applied Economics*, Vol. 33, pp. 689 - 700.
- Hondroyannis, 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 domestic performance, *Review of International Economics*, Vol.8, pp. 60 - 73.

Code	ΠΛ0724	Elective	Semester	8
Title	Virtual Enterprises and New Technologies			
Instructor(s)	Christos Georgiadis (50%), Emmanouil Stiakakis (50%)			
Objective	(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.			
Content	<p>Introduction to the concept of virtual enterprise (analysis of the term «virtual enterprise», introduction to the relationship between virtual enterprises and Information & Communications Technologies)</p> <p>Knowledge management and virtual communities (types of virtual communities, economy and virtual communities, social Web, development stages of virtual communities)</p> <p>Entrepreneurship and virtual enterprise (analysis of the term «entrepreneurship» - ways to develop entrepreneurship, sources of financial support for entrepreneurship)</p> <p>E-Auctions (types of e-auctions, new technologies and e-auctions, advantages and disadvantages of online auctions)</p> <p>Case studies of virtual enterprises (successful cases of virtual enterprises, reasons to develop entrepreneurship).</p>			
Assessment	Compulsory Assignment 100%			
Textbooks	<p>Innovation, Strategy, Growth and Information Systems, by George I. Doukidis, published by I. Sideris, 2011 ISBN: 978-960-08-0528-4</p> <p>E-Business and E-Commerce, by David Chaffey, published by Pearson, 2008 ISBN: 978-960-461-171-3</p>			
Supplemental material				

Code	ΠΛ0609	Elective	Semester	8
Title	European Integration			
Instructor(s)	Eleni Katsouli			
Objective	<p>Upon completion of this course, students should be able to:</p> <p>(a) Understand the basic principles of European Integration</p> <p>(b) Identify the main theories of European Integration</p> <p>(c) Apply the methodologies of European Integration on real cases</p> <p>(d) Use the tools of European Integration in decision - making, both in the European Union and in its member-states separately</p>			
Content	<ul style="list-style-type: none"> - 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	<p>Final written examinations 70%</p> <p> Essay 30%</p> <p> Alternatively</p> <p> Two progress examinations 70%</p> <p> Essay 30%</p>			
Textbooks	<p>one of the following:</p> <p>Katsouli-Katou, E. (2007) Economic Analysis of the European Union, Thessaloniki: Zygos (in Greek).</p> <p>Mardas, D. (2006) From the EEC to the EU, Thessaloniki: Zygos (in Greek).</p>			
Supplemental material	Instructor's notes and transparencies			

Code	ΠΛ0809	Elective	Semester	8
Title	Distributed Systems			
Instructor(s)	Konstantinos Margaritis			
Objective	Subjects covered: operation principles, design and programming 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.			
Content	Distributed Systems, Distributed Applications Internet, TCP/IP and WWW Client-Server Model, Multi-Tier Architectures, Java Applets Concurrency, Multithreaded Client-Server Data Base Servers, Data Replication, Distributed Transactions RPC, RMI and Distributed Objects XML, XML-RPC, Web Services Distributed Systems Models and Design Bots, Agents and Spiders Ubiquitous and Mobile Computing			
Assessment	Project and oral examination 50% Coursework 50%			
Textbooks	DEVELOPING DISTRIBUTED AND E-COMMERCE APPLICATIONS, D. INCE, ADDISON WESLEY DISTRIBUTED SYSTEMS PRINCIPLES AND PARADIGMS, TANENBAUM, VAN STEEN, Prentice-Hall ΚΑΤΑΝΕΜΗΜΕΝΑ ΣΥΣΤΗΜΑΤΑ ΜΕ JAVA, ΚΑΒΟΥΡΑΣ, ΜΗΛΗΣ, ΞΗΛΩΜΕΝΟΣ, ΠΟΥΚΟΥΝΑΚΗ, ΕΚΔ. ΚΛΕΙΔΑΡΙΘΜΟΣ			
Supplemental material	Instructor's Web Site			

Code	ΠΛ0806	Elective	Semester	8
Title	Neural Networks			
Instructor(s)	Ioannis Refanidis			
Objective	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.			
Content	<p>Machine learning. 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.</p>			
Assessment	Written exams (in classroom) 100% Optional homework up to 30%			
Textbooks	Neural Networks and Machine Learning (3rd edition) by Haykin Simon Prentice Hall, 2008 ISBN: 978-0131471399 Artificial Neural Networks (in Greek) by Konstantinos Diamantaras Kleidarithmos publishers, 2007 ISBN: 978-960-461-080-8			
Supplemental material				

Code	ΠΛ0816	Elective	Semester	8
Title	Web Programming			
Instructor(s)	Maria Satratzemi (50%), Georgios Evangelidis(50%)			
Objective	The student will be able to: (a) develop applets with graphical user interface, (b) manage events and threads, (c) develop applets to perform animation and play sound, (d) connect to a DBMS from a java program and manage a database via JDBC, (e) implement applications with servlets and/or jsp, (f) implement database transactions in java.			
Content	<p>APPLET DEVELOPMENT. GRAPHICS, THE AWT LIBRARY. GRAPHICAL USER INTERFACE, THE BASIC COMPONENTS (CLASS BUTTON, LABEL, LIST, CHECKBOX, TEXTFIELD, TEXTAREA).</p> <p>DELEGATION EVENT MODEL. EVENT: BUTTON, TEXT FIELD, TEXT AREA, SCROLLBAR, MOUSE, KEYBOARD.</p> <p>LAYOUT MANAGERS.</p> <p>MORE ABOUT THE GRAPHICAL USER INTERFACE</p> <p>SWING LIBRARY</p> <p>THREADS. SOUND, IMAGE, ANIMATION</p> <p>INTERNET APPLICATION ARCHITECTURE</p> <p>JDBC</p> <p>J2EE KAI SERVLETS</p> <p>J2EE KAI JSP - SQLJ</p> <p>APACHE TOMCAT KAI DATABASE TRANSACTIONS</p>			
Assessment	<p>Written Final examination 80%</p> <p>Coursework 20%</p>			
Textbooks	<p>Core Servlets & Java Server Pages: Vol. 1 Core Technologies MARTY HALL, LARRY BROWN</p> <p>Introduction to Java Giorgos Liakeas</p>			
Supplemental material	Instructor's Notes			

Code	ΠΛ0823	Elective	Semester	8
Title	Knowledge Discovery from Databases			
Instructor(s)	Georgios Evangelidis			
Objective	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).			
Content	Introduction to knowledge discovery from databases concepts - Data Warehousing - Multidimensional cubes - OLAP - Data Mining concepts - Classification - Clustering - Association Rules.			
Assessment	Project 50% Presentation in class 40% Active participation in class 10%			
Textbooks	<p>one of the following :</p> <p>Roiger R. And Geatz M., "Data Mining: A Tutorial Based Primer", Addison-Wesley, 2002. (translated in greek)</p> <p>Βαζιργιάννης Μ., Χαλκίδη Μ., "Εξόρυξη γνώσης από βάσεις δεδομένων και τον παγκόσμιο ιστό", 2η έκδοση, Γ. ΔΑΡΔΑΝΟΣ - Κ. ΔΑΡΔΑΝΟΣ Ο.Ε., 2005, Αθήνα (in greek)</p>			
Supplemental material	P.-N. Tan, M. Steinbach and V. Kumar, Introduction to Data Mining Addison Wesley, 2006. Instructor's Notes			

Code	ΠΛ0888	Elective	Semester	8
Title	Taxation for Individuals and Business Entities			
Instructor(s)	Athanasios Bazakidis, Antonios Stauroopoulos			
Objective	<p>This course is aiming to:</p> <ul style="list-style-type: none"> 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. 			
Content	<p>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 objective. The lectures of this course combine theoretical examples and case studies which are solving using hand written and the use of software.</p>			
Assessment	Written Final examination 100%			
Textbooks	<ol style="list-style-type: none"> 1. Karagiannis, D., Karagiannis, I., Karagianni, A. (2010), Taxation and tax statements, Edition 13th, Thessaloniki, Greece. 2. Ginoglou, D. (2004), Business accounting and taxation of individuals and business entities, Rosili, Athens, Greece. 3. Notes and slides given during the lectures. 			
Supplemental material	1. Stamatopoulos, D., Karavokiris, A. (2009), Revenue taxation of individuals and business entities, Edition 6th, tax institute, Athens, Greece.			

Code	ΠΛ0720	Elective	Semester	8
Title	Time Series			
Instructor(s)	Demetrios Papanastassiou			
Objective	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.			
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	Project work, consisting of a real life series for which students have to work out meaningful forecasts. The series is selected after consulting the teacher.			
Textbooks	Εφαρμοσμένη Στατιστική: Πολλαπλή Παλινδρόμηση, Ανάλυση Διασποράς, Χρονοσειρές Ε. Μπόρα-Σέντα, Χ. Μουσιάδης Εκδόσεις Ζήτη, Θεσσαλονίκη, 1997, ISBN: 9604311840 Σύγχρονες Μέθοδοι Ανάλυσης Χρονολογικών Σειρών Σ. Διμέλη Κριτική, Αθήνα, 2003, ISBN: 9789602182956			
Supplemental material	The Analysis of Time Series: Theory and Practice C. Chatfield Chapman & Hall, London, 1975, ISBN: 0-412-14180-9 Time Series Analysis, With Applications in R J. D. Cryer, K-S Chan Springer-Verlag, New York, 2008, ISBN: 978-1-4419-2613-5			

Code	ΠΛ0818	Elective	Semester	8
Title	Cost Accounting			
Instructor(s)	Athanasios Vazakidis (50%), Antonios Stavropoulos (50%)			
Objective	<p>This course is aiming to:</p> <ol style="list-style-type: none"> 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. 			
Content	<p>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.</p>			
Assessment	<p>Laboratory exams 80% Final writing exams 20%</p>			
Textbooks	<ol style="list-style-type: none"> 1. Karagiannis, D., Karagiannis, I., Karagianni, A. (2009), Cost accounting using the 9th class of accounts of the Greek general accounting chart, inventory management and flows of inventories, Edition 4th, Thessaloniki, Greece. 2. Garrison, R., and Noreen, E. (2006), Managerial accounting, Edition 11th Κλειδάριθμος, Αθήνα. 3. Notes and slides given during the lectures. 			
Supplemental material	<ol style="list-style-type: none"> 1. Venieris, G. (2005), Cost accounting, Stamoulis editions, Athens, Greece. 2. Pomonis, N. (2009), Cost accounting, Stamoulis editions, Athens, Greece. 			

Code	ΠΛ0828	Elective	Semester	8
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Title	Constraint Logic programming
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Instructor(s)	Ilias Sakellariou
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Objective	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.
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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).
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Assessment	Final Written Examination at the end of the semester (70% of the final mark), Weekly lab sessions and assignments (10%), Coursework (20%)
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Textbooks	one of the following : PROgramming in LOGic (in Greek only) M. Katzouraki, M. Gergatsoulis, S. Kokkotos New Technology Publications 1991, (Code in Evdoxos. 7261) Programming in Logic - PROLOG (in Greek only) Notopoulos Panagiotis Anikoula, 2008, ISBN: 9789608729384
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Supplemental material	K. R. Apt, M. G. Wallace, "Constraint Logic Programming Using ECLiPSe", Cambridge University Press, 2007. Bratko, Prolog Programming for Artificial Intelligence, (3rd edition), Addison Wesley, 2001 ISBN-10:0201403757, ISBN-13:9780201403756. R. Kowalski, Logic for Problem Solving, North-Holland, 1983 (from author's web page)
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