

Programme of Studies

Academic Year 2002 - 2003



**Department of
Applied Informatics**

University of Macedonia
Economic and Social Studies
Department of Applied Informatics
Head of Department
Professor **ANASTASIOS KATOS**
Vice Head of Department
Professor **KONSTANTINOS PAPANIZOS**

▪ **PROFESSORS**

KATOS Anastasios

B.Sc in Mathematics, A.U.Th. (1968). Ph.D. in Economics, A.B.Σ.Θ. (1973). M.Sc. in Econometrics, University of Southampton U.K. (1974). Ph.D. in Econometrics, University of Southampton U.K. (1977).

MARGARITIS Konstantinos

Diploma in Electrical Engineering, A.U.Th. (1984). M.Sc. in Theory and Application of Computation, Loughborough University of Technology U.K. (1985). Ph.D. in Computer Studies, Loughborough University of Technology U.K. (1988).

PAPADIMITRIOU Ioannis

B.Sc in Mathematics, A.U.Th. (1969). DEA Statistiques Universite de Paris VI (1977). Doctorat 3e Cycle Mathematiques Universite de Paris VI (1978).

PAPARIZOS Konstantinos

B.Sc in Mathematics, A.U.Th. (1972). M.Sc. in Operations Research, Case Western Reserve University, USA (1981). Ph.D. in Operations Research, Case Western Reserve University (1983).

PEKOS Georgios

B.Sc in Mathematics, A.U.Th. (1972). B.Sc in Economics, A.U.Th. (1975). Ph.D in Economics, A.B.Σ.Θ. (1978).

▪ **ASSOCIATE PROFESSORS**

VLACHOPOULOU –NOUSIA Maria

B.Sc in Economics, A.U.Th (1978). M.A in Business Administration, A.U.Th. (1987). B.Sc in Law, A.U.Th. (1989). Ph.D in Applied Informatics, University of Macedonia (1992).

GEORGANTA Zoe

B.Sc in Economics, A.Σ.O.E.E. (1971). M.A. in Economics, University of Leeds U.K. (1976). Ph.D. in Economics, University of Leeds U.K. (1980).

DRITSAKIS Nikolaos

B.Sc in Economics, A.B.Σ.Θ. (1977). Ph.D in Applied Informatics, University of Macedonia (1992).

KONSTANTOPOULOU Chrisoula

Maitrise en Sociologie Univ. de Paris V - Sorbone (1979). Πτυχίο Δημοσίου Δικαίου και Πολιτικών Επιστημών, University of Athens (1979). DEA

Anthropologie Sociale, Univ. de Paris V (1980). DEA Etudes Politiques Université de Paris II (1981). DEA Sciences de l' Information, Univ. de Paris II (1982). Doctorat 3e Cycle en Sociologie, Sorbone (1982). DEA Sociologie du Droit, Univ. de Paris II (1983). Doctorat d' etat, Sociologie, Sorbone (1990)

MAKRIDOU-MPOUSIOU Despoina

B.Sc. in Economics, A.B.Σ.Θ. (1979). Ph.D in Applied Informatics, University of Macedonia (1992).

MANITSARIS Athanasios

B.Sc. in Mathematics, A.U.Th. (1975). DEA Mathematiques Statistiques, Univ. de Paris VI (1977). Ph.D. in Applied Informatics, University of Macedonia (1992).

PAPANASTASIOU Dimitrios

B.Sc. in Mathematics, A.U.Th. (1974). M.Sc. in Operations Research, Aston University U.K. (1977). Ph.D. in Statistics, Birkbeck London University U.K. (1989).

TSOPOGLOU Stauros

Ohio University, U.S.A. (1973). MBA in General Business, York University, CA (1975). Ph.D. in Applied Informatics, University of Macedonia (1991).

FRAGOPOULOU –MANTHOU Vasiliki

B.Sc. in Management and Administration, Louisiana State University, U.S.A. (1976). Ph.D. in Applied Informatics, University of Macedonia (1991).

▪ **ASSISTANT PROFESSORS**

ALEXANDROPOULOU Eugenia

B.Sc. in Law, A.U.Th. (1981). Ph.D. in Law, A.U.Th. (1993).

VAZAKIDIS Athanasios

B.Sc. in Economics, A.B.Σ.Θ. (1977). Ph.D. in Applied Informatics, University of Macedonia (1998).

VOGIATZIS Alexandros

B.Sc. in Economics, A.Π.Θ. (1976). Ph.D. in Applied Informatics, University of Macedonia (1992).

EVAGELIDIS Georgios

B.Sc. in Mathematics, A.U.Th. (1987). M.Sc. in Computer Science, Northeastern University Boston U.S.A. (1990). Ph.D. in Computer Science, Northeastern University Boston U.S.A. (1994).

KATSOULI – KATOU Eleni

B.Sc. in Economics, A.B.Σ.Θ. (1978). Ph.D. in Applied Informatics, University of Macedonia (1992).

ROUMELIOTIS Manos

B.Sc. in Engineering, A.U.Th. (1981). M.Sc. in Computer Engineering, Virginia Polytechnic Institute and State University (Virginia Tech) Blacksburg VA U.S.A. (1983). Ph.D. in Computer Engineering, Virginia Polytechnic Institute and State University (Virginia Tech) Blacksburg VA U.S.A. (1986).

SATRATZEMI Maria

B.Sc. in Mathematics, A.U.Th. (1980). Ph.D. in Applied Informatics, University of Macedonia (1991).

STEPHANIDES Georgios

B.Sc. in Mathematics, University of Ioannina (1974). Ph.D. in Applied Informatics, University of Macedonia (1999).

CHARITOU Adamantios

B.Sc. in Mathematics, A.U.Th. (1970). M.Sc. in Statistics, Brunel University U.K. (1983). Ph.D. in Applied Informatics, University of Macedonia (1992).

▪ LECTURES

MAURIDIS Ioannis

Πτυχίο τμ. Μηχανικού Ηλεκτρονικών Υπολογιστών και Πληροφορικής της Πολυτεχνικής Σχολής, Πανεπιστήμιο Πατρών (1985). Διδάκτωρ. Τμ. Γενικού Τομέας Υπολογιστικών Μεθόδων και Προγραμματισμού Η/Υ της Πολυτεχνικής Σχολής, Α.Π.Θ. (2000).

REFANIDIS Ioannis

B.Sc. in Physics A.U.Th. (1992). B.Sc. in Informatics, A.U.Th. (1997). Ph.D. in Informatics, A.U.Th. (2001).

FOULIRAS Panagiotis

B.Sc. in Physics, A.U.Th (1987). M.Sc. in Computer Science, Queen Mary & Westfield College, University of London, UK (1989). Ph.D. in Computer Science, Queen Mary & Westfield College, University of London, UK (1994).

CHATZIGEORGIOU Alexandros

Diploma in Engineering and Computer Engineering, A.U.Th. (1996). Διδάκτωρ τμ. Πληροφορικής, Α.Π.Θ. (2000).

▪ E.T.E.Π.

ARVANITAKI Stamatia

STAUROPOULOS Antonios

▪ **ΔΙΟΙΚΗΤΙΚΟ ΠΡΟΣΩΠΙΚΟ**

ΙΟΑΝΝΟΥ – RONDOGIANNI Fotini
(Προϊσταμένη Γραμματείας)
VALANI Vasiliki
PSATHA Alcmimi



PROGRAMS OF STUDY

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.

The curriculum leads to a Bachelor's Degree in Applied Informatics after successfully completing 173 credit units. One credit unit corresponds to one hour of class attendance per week. The 173 credit units include 157 credit units courses, 16 credit units of English. The compulsory and elective courses cover 5 areas. The following table gives the distribution of credit hours in each area.

<u>Area of study</u>	<u>Core</u>		<u>Electives</u>	
	<u>Hours</u>	<u>%</u>	<u>Lectures</u>	<u>%</u>
			<u>2 hours/week</u>	
1. Computer Science 47.06	83	58.04	24	
2. Mathematic and Statistic Science 13.73	23	16.08	7	
3. Economics, Business Studies and Social Sciences 33.33	21	14.69	17	
4. Thesis 5.88	0	0.0	3	
11. English language	16	11.19	0	0.0

THESIS

With the start of the 7th semester, a research topic is assigned to every student, and under the supervision of a member of the teaching staff. By the end of the 8th semester, the student who selects a thesis has to submit for evaluation and present it. A successful thesis corresponds to 6 credit units.

If a student doesn't select a thesis, then he/she must select two (2) elective courses in the 7th semester and one (1) elective course in the 8th semester, that is six (6) credit units (two (2) credit units for any elective course times three (3) courses which corresponds to a thesis = six (6) credit units).

LABORATORIES

The department's computing facilities consist of the following labs:

- The microcomputer network lab which includes 40 DOS/WINDOWS based microcomputers connected to a Novell network server. This lab is used for teaching, software development and thesis work.
- The multimedia lab which has facilities for video, audio and graphics processing to develop multimedia presentations. It is used for practical training and thesis preparation.
- The graduate student lab includes microcomputers for faculty and graduate student use.
- The parallel processing lab which includes Transputer based multiprocessor systems for teaching and research.
- The workstation lab which includes high performance DEC Alpha workstations for research and thesis preparation.
- A Linux lab which is used mainly for practical training, and TCP/IP applications.

All computers are connected through an EIA/TIA-568 telecommunications wiring standard to the University's FDDI backbone running at 100Mbps. Access to the Internet is provided through a router, while a 10 modem pool offers PPP incoming connections to students and faculty members.

ENGLISH LANGUAGE

Students have to study 4 hours of English language each week for the first four semesters. English is compulsory and corresponds to 16 semester-hours.

1ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
INTRODUCTION TO INFORMATICS	2h/w + 1h/w	G. Stephanides, Assistant Professor Al. Chatzigeorgiou, Lecturer
MATHEMATICS I	3h/w	G. Pecos, Professor G. Stephanides, Assistant Professor
MATHEMATICS IN COMPUTER SCIENCE	3h/w	G. Pecos, Professor G. Stephanides, Assistant Professor
PROGRAMMING I	4h/w	M. Satratzemi, Assistant Professor
PRINCIPLES OF ECONOMICS	3h/w	D. Mpousiou Associate Professor E. Katsouli, Assistant Professor
ALGORITHMS	3h/w	K. Paparizos, Professor Al. Chatzigeorgiou, Lecturer
FOREIGN LANGUAGE	4h/w	G. Ipsilantis

2ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
MATHEMATICS II	4h/w	G. Pekos, Professor G. Stephanides, Assistant Professor
DATA STRUCTURES	3h/w	M. Satratzemi, Assistant Professor
BUSINESS ADMINISTRATION	3h/w	M. Vlachopoulou, Associate Professor
PROGRAMMING II (VISUAL)	3h/w	A. Manitsaris, Associate Professor P. Fouliras, Lecturer
ANALYSIS AND DESIGN OF ALGORITHMS	2h/w + 1h/w	K. Paparizos, Professor
COMPUTER SYSTEMS ORGANIZATION	3h/w + 1h/w	Al. Chatzigeorgiou, Lecturer
FOREIGN LANGUAGE	4h/w	G. Ipsilantis

3ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
COMPUTATIONAL MATHEMATICS	3h/w	G. Stephanides, Assistant Professor
MICROECONOMIC ANALYSIS	3h/w	A. Katos, Professor
ARCHITECTURE OF COMPUTERS	3h/w	M. Roumeliotis, Assistant Professor
STATISTICS I	2h/w + 2h/w	I. Papadimitriou, Professor
OBJECT – ORIENTED PROGRAMMING	2h/w + 1h/w	G. Stephanides, Assistant Professor Al. Chatzigeorgiou, Lecturer
FOREIGN LANGUAGE	4h/w	G. Ipsilantis

ELECTIVE COURSES (choose one (1) course)	HOURS	PROFESSORS
INTRODUCTION TO THE THEORY OF AUTOMATA	2h/w	I. Refanidis, Lecturer
SYSTEMS PROGRAMMING AND ADMINISTRATION	2h/w	P. Fouliras, Lecture
INTERNATIONAL ECONOMICS	2h/w	E. Katsouli, Assistant Professor
PRODUCTION MANAGEMENT	2h/w	N. Kofidis, Visiting Professor
SPECIAL MATHEMATICAL SUBJECTS WITH COMPUTERS	2h/w	G. Stephanides, Assistant Professor

4ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
NETWORK PROGRAMMING	3h/w	K. Paparizos, Professor
ACCOUNTING	3h/w	A. Vazakidis, Assistant Professor A. Staurooulos, E.T.E.Π.
STATISTICS II	3h/w	D. Papanastasiou, Assistant Professor
OPERATING SYSTEMS	4h/w	M. Roumeliotis, Assistant Professor
MACROECONOMICS MODELS AND POLITICS	3h/w	Z. Georganta, Associate Professor
FOREIGN LANGUAGE	4h/w	G. Ipsilantis

ELECTIVE COURSES (choose one (1) course)	HOURS	PROFESSORS
BUSINESS ETHICS	2h/w	Z. Georganta, Associate Professor
ISSUES LAW	2h/w	E. Alexandropoulou, Assistant Professor
ΠΟΙΟΤΙΚΟΣ ΕΛΕΓΧΟΣ	2h/w	A. Katos, Professor
APPLIED ECONOMICS I	2h/w	A. Vogiatzis, Assistant Professor
ΨΗΦΙΑΚΗ ΣΧΕΔΙΑΣΗ ΚΑΙ ΟΛΟΚΛΗΡΩΜΕΝΑ ΣΥΣΤΗΜΑΤΑ	2h/w	K. Margaritis, Professor M. Roumeliotis, Assistant Professor

5ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
DATABASE I	3h/w + 1h/w	G. Evagelidis, Assistant Professor
COMPUTER NETWORKS	3h/w	P. Fouliras, Lecturer
COMPUTER GRAPHICS	2h/w + 1h/w	A. Manitsaris, Associate Professor
STATISTICS III	3h/w	A. Charitou, Assistant Professor
MANAGERIAL FINANCE	3h/w	St. Tsopoglou, Associate Professor A. Vazakidis, Assistant Professor

ELECTIVE COURSES (choose two (2) courses)	HOURS	PROFESSORS
APPLIED ECONOMICS II	2h/w	A. Vogiatzis, Assistant Professor
SPECIAL ACCOUNTING ISSUES	2h/w	A. Vazakidis, Assistant Professor A. Stauroopoulos, E.T.E.Π.
LAW OF INFORMATION	2h/w	Eug. Alexandropoulou, Assistant Professor
GRAPH THEORY	2h/w	M. Satratzemi, Assistant Professor
INTRODUCTION TO CHAOS THEORY	2h/w	M. Adamopoulos, Visiting Professor

6ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
DATABASE II	2h/w + 1h/w	G. Evagelidis, Assistant Professor
HUMAN COMPUTER INTERACTION	2h/w + 1h/w	A. Manitsaris, Associate Professor P. Fouliras, Lecturer
ANALYSIS AND DESIGN OF INFORMATION SYSTEMS	3h/w	V. Manthou, Associate Professor
MARKETING	3h/w	M. Vlachopoulou, Associate Professor
ECONOMETRICS I	3h/w	A. Katos, Professor N. Dritsakis, Associate Professor

ELECTIVE COURSES (choose two (2) courses)	HOURS	PROFESSORS
3D GRAPHICS – ANIMATION	2h/w	A. Manitsaris, Associate Professor
COMPUTER NETWORKS DEVELOPMENT	2h/w	P. Fouliras, Lecturer
EUROPEAN INTEGRATION	2h/w	E. Katsouli, Assistant Professor
SIMULATION TECHNIQUES	2h/w	M. Roumeliotis, Assistant Professor
MONEY AND FINANCIAL MARKETS	2h/w	St. Tsopoglou, Associate Professor
ANALYSIS OF PRODUCTIVITY AND TECHNICAL EFFICIENCY	2h/w	Z. Georganta, Associate Professor
TEACHING METHODS I	2h/w	D. Mpousiou, Associate Professor
CATEGORICAL DATA ANALYSIS	2h/w	A. Charitou, Assistant Professor
INFORMATION RETRIEVAL	2h/w	K. Margaritis, Professor G. Evagelidis, Assistant Professor
DATA ANALYSIS	2h/w	I. Papadimitriou, Professor
ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΨΗΦΙΑΚΗ ΕΠΕΞΕΡΓΑΣΙΑ ΚΑΙ ΑΝΑΛΥΣΗ ΕΙΚΟΝΑΣ	2h/w	Th. Papadimitriou, Visiting Professor

CRYPTOGRAPHY	2h/w	G. Pecos Professor G. Stephanides, Assistant Professor
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7ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
INFORMATION SYSTEMS MANAGEMENT	3h/w	V. Manthou, Associate Professor
MULTIMEDIA SYSTEMS	2h/w + 1h/w	A. Manitsaris, Associate Professor
ECONOMETRICS II	3h/w	A. Katos, Professor N. Dritsakis, Associate Professor
ACCOUNTING SOFTWARE	3h/w	A. Vazakidis, Assistant Professor A. Staupoulos, E.T.E.Π.

ELECTIVE COURSES (choose three (3) courses and thesis. If don't choose thesis choose five (5) courses)	HOURS	PROFESSORS
THESIS (start)	Corresponds to three elective courses in a year.	
INNOVATION	2h/w	Z. Georganta, Associate Professor
MARKETING INFORMATION SYSTEMS	2h/w	M. Vlachopoulou, Associate Professor
INFORMATION SYSTEMS SECURITY	2h/w	I. Mavridis, Lecturer
TEACHING METHODS II		D. Mpousiou, Associate Professor
COMMUNICATION I	2h/w	Visiting Professor
PARALLEL PROCESSING	2h/w	K. Margaritis, Professor
MODELS OF QUALITATIVE VARIABLES	2h/w	Z. Georganta, Associate Professor
SPECIAL TOPICS IN ANALYSIS OF ALGORITHMS (NP – Completeness)	2h/w	G. Alexouda, Visiting Professor
TIME SERIES ANALYSIS	2h/w	D. Papanastasiou, Associate

		Professor
COMPUTER INTENSIVE STATISTICAL METHODS	2h/w	D. Papanastasiou, Associate Professor
PROGRAMMING LANGUAGES	2h/w	G. Evagelidis, Assistant Professor

8ST SEMESTER

COMPULSORY COURSES	HOURS	PROFESSORS
INTERNET PROGRAMMING	3h/w	M. Satratzemi, Assistant Professor
SOFTWARE ENGINEERING	3h/w	Al. Chatzigeorgiou, Lecturer
MATHEMATICAL PROGRAMMING	4h/w	K. Paparizos, Professor
ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	3h/w	I. Refanidis, Lecturer

ELECTIVE COURSES (choose three (3) courses and thesis. If don't choose thesis choose four (5) courses)	HOURS	PROFESSORS
THESIS (end)	Corresponds to three elective courses in a year.	
DECISION SUPPORT SYSTEMS	2h/w	G. Alexouda, Visiting Professor
ELECTRONIC COMMERCE	2h/w	M. Vlachopoulou, Associate Professor
COMMUNICATION II	2h/w	Visiting Professor
MANAGEMENT OF DATA PROCESSING DATA		G. Charamis, Professor of dep. Business Administration
COMPUTER INTEGRATED MANUFACTURING (CIM) SYSTEMS	2h/w	St. Vougioukas, Visiting Professor
NEURAL NETWORKS	2h/w	I. Refanidis, Lecturer
LOGISTICS INFORMATION SYSTEMS	2h/w	V. Manthou, Associate Professor
ACCOUNTING SOFTWARE	2h/w	St. Tsopoglou, Associate Professor A. Vazakidis, Assistant Professor A. Staurooulos E.T.E.Π.

METHODS OF OPERATION RESEARCH	2h/w	A. Valaristos, Visiting Professor
DISTRIBUTED SYSTEMS	2h/w	K. Margaritis, Professor
SPECIAL TOPICS OF ECONOMETRICS	2h/w	N. Dritsakis, Associate Professor
ΕΠΕΞΕΡΓΑΣΙΑ ΗΧΟΥ		A. Manitsaris, Associate Professor
ΕΠΕΞΕΡΓΑΣΙΑ ΨΗΦΙΑΚΩΝ ΕΙΚΟΝΟΣΕΙΡΩΝ		Th. Papadimitriou, Visiting Professor

ΠΕΡΙΕΧΟΜΕΝΑ ΜΑΘΗΜΑΤΩΝ

A.1. INTRODUCTION TO INFORMATICS

G. Stephanides, Al. Chatzigeorgiou

Informatics as a science. Evolution of computers and computing. Machine architecture: Data storage, data manipulation. Software: Algorithms, programming languages, operating systems. Data Organization: Data structures, file structures, database structures. Basic application areas of modern informatics. Introduction to the C programming language.
Work environments: MS-DOS, MS-Windows, MS-Office, MS - Excell.

A.2. MATHEMATICS I

G. Pecos – G. Stephanides

Subject: Introduction to Mathematical Analysis-Linear Algebra and applications to Economics and Business. MATrix LABoratory.

Content: Introduction to the Theory of Functions. Examples of Functional Forms. Limits. Matrices. Determinants. Linear Systems. Applications to Economics and Business. Introduction to MAPLE.

A.3. MATHEMATICS OF COMPUTER SCIENCE

G. Pecos – G. Stephanides

Subject: The study of discrete objects and relationships among them.

Content: Sets. Propositions. Relations. Arithmetic and Generating Functions. Combinatorial Analysis. Discrete Probability. Graphs. Trees. Groups, Rings and Algebraic Systems.

A.4. PROGRAMMING I

M. Satratzemi

Introduction to an Integrated programming environment, program development (program coding, debugging, execution and testing). Basic Pascal: constants,

variables, data types (integer, real, Boolean). The assignment statement. Input/output statements. Sequential structure. Selection structures (if, nested, if case). Repetition structures (while, repeat, for). Arrays, Strings, sets. Structured programming: procedures, functions, units. Records, Array of records. Files: text files, typed files. Programming labs with Pascal.

A.5. PRINCIPALS OF ECONOMICS

D. Mpousiou – E. Katsouli

Subject: Basic concepts and methodology in economics.

Content: Scarcity and choice. The market. The role of the government. National Product. Unemployment. Inflation. Consumption, savings and investment. Determination of national income. Income equilibrium. Fiscal and monetary policies. External sector. Demand and Supply of goods. Production and costs. Market structures.

A.6. ALGORITHMS

K. Paparizos – Al. Chatzigeorgiou

Subject: Introduction to the Algorithms.

Content: Introduction to the algorithmic way of thinking. The concept of algorithm, algorithmic symbolism, data representation, solution of the problems with using computers. Basic algorithm concepts, repetitive processes, recursive structure, design of algorithms.

B.1. MATHEMATICS II

G. Pekos – G. Stephanides

Subject: 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 or without restrictions). Differential Equations. Elements from the theory of Differences. Applications to Economics and Business. Solving problems of Linear Algebra using MATLAB.

B.2. DATA STRUCTURES

M. Satratzemi

Introduction to Data Structures. Stacks, Basic operations, Implementing stacks with arrays and records, application of stacks. Queues, Basic operations, implementing Queues with arrays and records, application of Queues. Lists, Basic operations, sequential storage implementation of Lists. Introduction to Linked Lists, array-based implementation of Linked Lists. A pointer-based implementation of Linked lists. A pointer-based implementation of Stacks and Queues. Linked implementation of sparse polynomials. Binary Trees, basic

operations. A pointer-based implementation of Binary Trees. A recursive implementation of Binary trees. Application of Binary Trees: Huffman Codes. AVL Trees, basic operations. B-Trees, B+-Trees. Hashing, open probing, Chaining.

B.3. BUSINESS ADMINISTRATION

M. Vlachopoulou

Subject: Fundamentals and emerging trends in management. The management functions. The process of attaining organizational goals by effectively and efficiently planning, organizing, leading, and controlling the organization's human, physical, financial, and information resources.

Content: Organization patterns and environment. Business operations. Management and social responsibility. Management functions. Planning and decision making, organizing, leading, human resource management, controlling, Information systems – new technologies (MIS, Internet, telework, virtual enterprise-cooperation), Information resource management, total quality management. Case-studies.

B.4. PROGRAMMING II (VISUAL)

A. Manitsaris

Subject: Introduction to visual programming. Using visual tools, and object oriented event driven programming for the design of modern applications in a graphical user interface.

Contents: Well-known visual programming languages and their philosophy. The Visual Basic integrated development environment (IDE). The most significant language structures (variable types, condition and loop structures, tables and subroutines). Controls, properties, methods and events. Using forms, buttons, text boxes, list boxes, scroll bars, common dialogs and timers. Creating and modifying menus. Introduction to graphics, formatting the application interface. Using files. Strings manipulation. Debugging code and handling errors. Creating classes for user defined objects.

B.5. ANALYSIS AND DESIGN OF ALGORITHMS

K. Papparizos

Subject: Problems and instances, Worst case, average case, best case analysis, Empirical analysis.

Contents: Computational models (Random access machine, a pseudocode), Asymptotic analysis (symbols O , Θ and Ω), difference equations. Analysis of loops, Shorting Algorithms (insertion, selection, bubble sort), Searching algorithms (sequential and binary search), Graph algorithms (connectivity, topological order), Papparizos' algorithms for optimal matching. Quickest short, maximum independent set, Fast Fourier Transform. Dynamic Programming (matrix multiplication, shortest paths). Data structures (shorting with priority

queues, minimum spanning tree algorithms with Fibonacci heaps). Scaling technique (scaling algorithms for minimum cost flow problems). Geometric improvement (Karp's algorithm for the maximum flow problem). Coefficient balancing technique (a maximum flow algorithm).

B.6. COMPUTER SYSTEMS ORGANIZATION

Al. Chatzigeorgiou

Subject: Organization and programming model of simple computer systems, machine and assembly language programming.

Content: Architecture and programming model of major microprocessor families and the related computer systems. Introduction to combinational and sequential digital circuits. Machine language level programming. Instruction formats. Addressing modes. Instruction types. Flow of control. Central Processing Unit Design. Introduction to assembly language. Assembly process. Macroinstructions. Linking and Loading. Assembly language programming.

Laboratory: Assembly language programming. Unix working environment.

C.1. COMPUTATIONAL MATHEMATICS

G. Stephanides

Subject: Computational methods and their implementation by means of the numerical software tool called MATrix LABoratory (MATLAB).

Content: Matrices. Errors and computer Arithmetic. Solution of Linear Systems. Eigenvalues – Eigenvectors. Roots of Function. Numerical Differentiation. Numerical Integration. Numerical Optimization. Matlab.

C.2. MICROECONOMIC ANALYSIS

A. Katos

Subject:

Content:

C.3. ARCHITECTURE OF COMPUTERS

M. Roumeliotis

Subject: In depth description of computer architecture components and computer evaluation.

Contents: Architectural Models, microcode and microinstruction execution, virtual memory –paging and segmentation, cache memory design, pipeline techniques, parallel processing architecture, design principles of RISC processors, computer performance evaluation, specialized architectures, vector and array processors, parallel computer evaluation.

C.4. STATISTICS I

I. Papadimitriou

Collection, classification and presentation of statistical data. Empirical distributions. Measures of location, dispersion and shape. Elements of probability theory. Definition and fundamental properties of probability of events. Total probability, conditional probability. Baye's rule. Random variables: Probability distribution of a random variable. Distribution function. Function of random variables. Expected value of a random variable, variance, covariance. Theoretical distributions. Discrete: Binomial, Poisson, etc. Continuous: Normal, Uniform, Gamma, Beta, etc. Sampling distributions.

C.5. OBJECT – ORIENTED PROGRAMMING

G. Stephanides – Al. Chatzigeorgiou

Subject: Object-Oriented Programming and its Implementation in Java

Contents: Programming and the Java Programming Language. Objects and Primitive Data. Program Statements. Writing Classes. Enhancing Classes. Inheritance. Exceptions and I/O Streams. Software Development Models.

ELECTIVE COURSES

C.6. INTRODUCTION TO THE THEORY OF AUTOMATA

I. Refanidis

Description: An introduction to the classic and modern theory of computation.

Topics: Alphabets and languages. Finite automata. Deterministic and non-deterministic automata. Moore and Mealy models. Variations of finite automata. Regular expressions and languages. Context-free grammars. Turing machine.

C.7. SYSTEMS PROGRAMMING & ADMINISTRATION

P. Fouliras

Subject:

Contents:

C.8. INTERNATIONAL ECONOMICS

E. Katsouli

International monetary relationships (currency market, determination of exchange rate, balance of payments, international monetary system). International trade (theories and empirical foundations of international trade

and factor movements, public barriers to trade, trade and developing countries, international enterprices.

C.9. PRODUCTION MANAGEMENT

N. Kofidis, Visiting Professor

Producticity and competitiveness, forecasting demang, product and service design, location planning and facilities layout process design and capacity planning, aggregate planning, inventory management, operations scheduling, quality control and advanced technologies for production and operations management.

C.10. SPECIAL MATHEMATICAL SUBJECT WITH COMPUTERS

G. Stephanides

Subject: The study of special subjects of Mathematics for Economics and Finance with computer systems.

Contents: Introduction to Mathematica. Eigenvalues – Eigen vectors. Real quadratic forms. Implicit functions. Optimization. Differential Equations. Differce equations.

D.1. NETWORK PROGRAMMING

K. Paparizos

Subject: Definitions, graphs, networks, paths connectivity, topological order, storing graphs and networks.

Contents: Minimum Cost Flow Problem, Special cases (tranportation problem, assignment problem, shortest path problem, maximum flow problem, tree problems), Generalizations of the MCFP (Generalized MCFP, multicomodity flow problem, convex cost flow problem, traveling salesman problem), Network transformations, Optimatlity Conditions. Applications, Primal simplex algorithm, Mean cycle algorithm, Successive Shortest Path Algorithm. Applications, Primal simplex algorithm, Paparrizos' algorithms (starting with the Balinsk tree, starting with the forest AKP, starting with a simple forest). Applications, primal simplex algorithm, Paparrizos' algorithms (starting with the Balinski tree, starting with simple forest), Algorithm of Achatz et al. Applications, minimum cuts, Angmenting path algorithm, Algorithm by Karp et al.

D.2. ACCOUNTING

A. Vazakidis

Purpose, nature and types of Accounting. Generally accepted accounting principles. Double-entry accounting system. Valuation of inventory methods. Depreciation. Preparation of Financial Statements (Journal, Ledger, Trial Balance, Balance Sheet, Income Statement). Adjusting and closing entries.

D.3. STATISTICS II

D. Papanastasiou

Laws of large numbers. Central limit theorems. Point estimation: Fundamental notions. The method of moments. The method of maximum likelihood. Examples. Confidence intervals (of mean, proportion, variance, difference of means and proportions, ratio of variances). Hypothesis testing: fundamental notions. Tests concerning means, proportions, equality of variances. X²-tests for goodness of fit, independence and homogeneity. Non-parametric tests.

D.4. OPERATING SYSTEMS

M. Roumeliotis

Subject: Introduction to operating system principles and design.

Contents: Operating system types. Processor management, process scheduling, interprocess communication and synchronization, semaphores. Memory management, static and dynamic allocation, virtual memory, paging and segmentation. File management, directory hierarchy, basic file system, DOS and Unix file systems. I/O management, device management, deadlocks, deadlock avoidance.

D.5. MACROECONOMICS MODELS AND POLICIES

Z. Georganta

The purpose of the course is to make students understand that macroeconomic thought is a powerful tool for the formation of sound economic policies for both the domestic and the foreign sectors of an economy. The course includes the following topics:

1. Review of the Greek economy in comparison with the EU.
2. National Accounts – Concepts and Measures – National Accounts of Greece and the EU.
3. Index Number theory – Price and Volume indices of the Greek economy.
4. Macroeconomic models: concept, specification, estimation, evaluation, use. Models of consumption, investment, imports and exports, IS-LM models, models of the labor market, simple multisector models and their use for policy purposes.

ELECTIVE COURSES

D.6. BUSINESS ETHICS

Z. Georganta

The course develops methods of management for the improvement of industrial relations in and out of the firm. The course does not describe rules of action, but it develops ways to act within the framework of a modern enterprise which

functions in a knowledge and information society. The course includes the following topics

1. The firm as a social institution.
2. Socio-ecological environment.
3. Firm and economic development (social cost, industrialization, multinationals, ideology, consumers movement).

D.7. ISSUES IN LAW

Eug. Alexandropoulou

D.8. ΠΟΙΟΤΙΚΟΣ ΕΛΕΓΧΟΣ

A. Katos

Subject:

Content:

D.9. APPLIED ECONOMICS I

Al. Vogiatzis

The dimensions of the agricultural sector in Greece and comparisons with the agricultural sector in the EU-countries. Management of agricultural exploitations. Trade of agricultural products (economic environment, characteristics, analysis and organization). The trading system in Greece. Common Agricultural Policy (CAP) in EU. Informative applications in the agricultural economy.

D.10. ΨΗΦΙΑΚΗ ΣΧΕΔΙΑΣΗ ΚΑΙ ΟΛΟΚΛΗΡΩΜΕΝΑ ΣΥΣΤΗΜΑΤΑ

K. Margaritis – M. Roumeliotis

Subject:

Content:

E.1. DATABASE I

G. Evangelidis

Subject: Introduction to DataBases

Content: Databases and Database Users, Database System Concepts and Architecture. Data Modeling using the Entity-Relationship Model. Relational Data Model and Relational Algebra. SQL. Functional Dependencies and Normalization for Relational Databases. Traditional Data Models.

E.2. COMPUTER NETWORKS

P. Fouliras

Subject: Introduction to computer networks and digital transmission.

Contents: Introduction to computer communications, communication parameters, the OSI reference model, protocols and model layers. The physical layer, data transmission, digital transmission media, modems, modulation techniques, error detection and correction, telecommunications, ISDN. The data link layer, Aloha protocols, Ethernet and CSMA protocols.

E.3. COMPUTER GRAPHICS

A. Manitsaris

Introduction in computer graphics. Basic linear algebra concepts. Algorithms for drawing lines, circles & ellipses. Polygon Filling Algorithms. Aliasing & Antialiasing Methods. 2D & 3D Geometric transformations, 2D & 3D Clipping Algorithms. 2D & 3D Projections. Viewing transformations. Hiding Algorithms.

E.4. STATISTICS III

A. Charitou

One way ANOVA. Two way ANOVA (with/without interaction). The Latin square and other experimental designs. Regression theory: Simple and Multiple linear regression (estimation, testing, partial correlation coefficient, model selection procedures). Polynomial regression. Regression with categorical response variables. Non-linear regression.

E.5. MANAGERIAL FINANCE

St. Tsopoglou – A. Vazakidis

Analysis of the financial environment of the company. Role and function of managerial finance. The time-value of money. The interest factor in financial decisions (compound and present value), compound and present value of an annuity). Analysis of financial statements (financial ratios, inflation, cost-expense-depreciation). Sources and uses of funds statement. Sources of short – term financing. Sources of long-term financing. The nature of the budgeting process. Cash budgeting.

ELECTIVE COURSES

E.6. APPLIED ECONOMICS II

Al. Vogiatzis

Subject: Elements of Tourism Economics. The sector of tourism as economic activity, in the Greek and the European Union economy.

Content: The study of tourism as an economic activity. Introduction to basic concepts and theories. Analysis of the economic importance of trend in the development of tourism. The tourist as a consumer and the demand of tourist

goods and services. Production of tourist goods and services. The cost and the supply of tourist goods and services. Measurement of tourist demand and the adaptation of supply. Determination of equilibrium price and quantity. The development and programming of tourist economy.

E.7. SPECIAL ACCOUNTING ISSUES

A. Vazakidis

This course will follow the recent developments in the production and use of software applications for general and cost accounting problem solving. Due to the rapid changes in accounting software it is necessary to redefine constantly the scope and purpose of this course.

E.8. LAW OF INFORMATICS

Eug. Alexandropoulou

Concept of Law-Distinctions and Sources of Law-Jurisprudence-Concept and Distinctions of Rights-Protection of Right-Natural and Legal Persons-Concept and Distinctions of Contracts-Modern forms of contracts (Emphasis is given on sales through Internet)-Legal protection of computer programs.

E.9. GRAPH THEORY

M. Satratzemi

Subject: Basic concepts of graph theory, graph representations.

Content: Connectivity, tree, minimum spanning trees, shortest paths and corresponding algorithms. Independent sets, dominating sets, matching, centers and medians.

E.10. INTRODUCTION TO CHAOS THEORY

M. Adamopoulos, Visiting Professor

Subject: Introduction to Chaos Theory

Content: Functions, The principle of Feedback, Mapping. Feedback machines. Introduction notions to Chaos Theory. Definitions: Systems, Dynamic Systems, Mathematical representation. Phase Space. Mapping. Equilibrium points. Attractors – Repelling – Saddle Points. Periodic Points. Linear and non Linear mappings. Sensitivity on initial conditions. Mathematical definition of Chaos. Poincare section (map). Models of Dynamic systems. Cobweb Plot, Bifurcation. Family of discrete dynamic models. Fractals-Strange Attractors. Lyapunov Exponent and others dimensions. Study of time series. Applications: Non Linear Models in Economics.

F.1. DATABASE II

G. Evagelidis

Subject: Database Management System Implementation techniques.

Content: Record Storage and Primary File Organizations. Index Structures for Files. System Catalog. Query Processing and Optimization. Transaction Processing Concepts. Concurrency Control Techniques. Recovery Techniques. Database Security and Authorization. Object – Oriented Databases, Distributed Databases and Client-Server Architecture. Spatial Indexing.

F.2. HUMAN COMPUTER INTERACTION

A. Manitsaris

Introduction to HCI. Theoretical background (human factor). **User interface technology** (data input – output, interaction styles, windows systems design, multimedia and virtual reality, cooperative systems, systems for handicapped people, information visualization, documentation (on line help, tutorials etc)). **Interaction systems design** (user-centered design methods, needs analysis – users, task analysis, usability). **Interaction systems implementation** (state diagrams, User Action Notation (UAN), prototyping languages). **Interaction systems evaluation** (the role of evaluation, heuristic evaluation, experimental – search methods, questionnaires construction principles, evaluation usability, methods comparison, descriptive statistics and data analysis techniques). **Applications:** Development and evaluation usability of training systems, Development and evaluation usability Internet systems, etc

F.3. ANALYSIS AND DESIGN OF INFORMATION SYSTEMS

V. Manthou

Subject: Basic concepts in analysis and design of information systems.

Content: Information systems and management. Means for the development of an information system. Analysis of information systems (request, data flow, object-oriented analysis). Design of information systems.

F.4. MARKETING

M. Vlachopoulou

Subject: Marketing Strategy and elements of the marketing-mix. Marketing Plan.

Content: The foundations of marketing (marketing defined, the marketing concept. Marketing management, marketing research, marketing strategy, marketing plan, marketing mix and marketing applications). Marketing management process. Target market selection, segmentation, and positioning. Consumer behavior. Marketing mix: Product, pricing, promotion, and distribution strategy. Creating the marketing plan. Marketing models. Case-studies.

F.5. ECONOMETRICS I

A. Katos – N. Dritsakis

Subject:
Content:

ELECTIVE COURSES

F.6. 3D COMPUTER GRAPHICS AND ANIMATION

A. Manitsaris

Curve and surface representation. Color. Lighting and shading Methods & Algorithms. Animation. Fractal geometry. Virtual Reality (VRML)

F.7. COMPUTER NETWORKS ANALYSIS

P. Fouliras

Subject:
Content:

F.8. EUROPEAN INTEGRATION

E. Katsouli

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 E.E.C. and the rest of the world.

F.9. SIMULATION TECHNIQUES

M. Roumeliotis

Subject: Introduction to simulation modeling and analysis.

Content: Simulation and emulation, systems and models, world views. Random and pseudorandom numbers, random number generators, sampling methods, Monte Carlo method. Discrete systems modeling, event and activity oriented simulation. Simulation program design, simulation languages. Analysis of simulation results, validation and verification.

F.10. MONEY AND FINANCIAL MARKETS

St. Tsopoglou

Financial markets and institutions. Valuation of bonds (state and corporate) and stocks. Stock-exchange indexes. Capital market theory. Factors which influence

the price of stocks. Portfolio management. Security price changes. Investment and mutual fund firms. Structure and organization of the banking system

F.11. ANALYSIS OF PRODUCTIVITY AND TECHNICAL EFFICIENCY

Z. Georganta

The course deals with the concept and measurement of total factor and partial productivity, as well as with the concept and measurement of technical or productive efficiency of firms. The approach adopted is development of theory followed by case studies. The course includes the following topics: 1. Basic Concepts of productivity, efficiency and competitiveness. 2. Productivity indices (capacity utilization, growth accounting, econometric approach). 3. Empirical measurement of productivity indices (measurement of output, inputs, data sources). 4. Empirical measurement of technical efficiency (econometric approach).

F.12. TEACHING METHODS I

D. Mpousiou

Basic concepts. Learning theories. Content analysis of specific subjects. Lesson plan. Teaching process and evaluation. Use of computer. Micro-teaching by students.

F.13. CATEGORIAL DATA ANALYSIS

A. Charitou

Introduction, describing and inference for two-way contingency tables. Models for binary response variables. Longlinear models and Logic models. Building and applying Longlinear models using computer software to analyze categorical data.

F.14. INFORMATION RETRIEVAL

K. Margaritis – G. Evagelidis

Subject: Information and knowledge retrieval and organization techniques.

Content: Introduction to Information Retrieval. Compression, String Searching, Vector space model, Indexes, Inverted Files, Signature Files, Weight assignment to text terms, Probabilistic models, Phrase based retrieval, Natural language processing and information retrieval, Hypertext and information retrieval, Intelligent systems and Information retrieval. Data mining. Knowledge discovery.

F.15. DATA ANALYSIS

I. Papadimitriou

Revision of linear Algebra. Eigenvalues and eigenvectors of matrices. Applications of the principles of linear algebra in the analysis of multivariate

data. Contingency Tables. The analysis in principal components. The factorial analysis of correspondences. Automatic classification.

F.16.

INTRODUCTION TO DIGITAL IMAGE PROCESSING AND ANALYSIS

Th. Papadimitriou, Visiting Professor

Subject: Digital Image Fundamentals including Image Enhancement, Restoration, Compression.

Content: Introduction to Digital Images, Image Enhancement in the Spatial and Frequency Domain, Image Restoration, Image Compression, Morphology, Image Segmentation, Region Description.

F.17.

CRYPTOGRAPHY

G. Pecos – G. Stephanides

Subject: Introduction to Cryptography and Data Security.

Content: Classical cryptography – simple cryptosystems. Cryptanalysis. Cryptographic Hash functions. The RSA cryptosystem and factoring integers. Shannon's theory.

G.1.

INFORMATION SYSTEMS MANAGEMENT

V. Manthou

Strategic management. Strategy planning for Management Information Systems. Frameworks for integrating Information Systems strategies with business strategies. Management Information Systems strategy implementation. The role and nature of Information Systems managers. Information value and Information Systems investment.

G.2.

MULTIMEDIA SYSTEMS

A. Manitsaris

Introduction to multimedia systems and virtual reality, hypertext, & hypermedia, basic concepts and features, architecture and models, navigation – interaction – retrieval & usability issues, multimedia networks, multimedia distributed systems, multimedia applications, multimedia & education, multimedia data processing tools (text, sound, image, graphics, animation and video), authoring tools (Visual Basic, Asymetrix Toolbook, FrontPage etc), multimedia systems and virtual reality analysis - design – implementation &, usability evaluation.

Applications: Development and evaluation usability of multimedia training systems, virtual worlds, Internet hypermedia systems, etc.

G.3.

ECONOMETRICS II

A. Katos – N. Dritsakis

Subject:

Content:

G.4. ACCOUNTING SOFTWARE

St. Tsopoglou – A. Vazakidis

The accounting plan. Software applications in general and cost accounting. Organization of Inventory, Notes Receivable, Notes Payable, Sales and Purchases accounts in files. Accounting trouble-shooting (prevention, searching and solving of mistakes). The adjusting and closing process. Preparation of year-end financial statements.

ELECTIVE COURSES

G.5. INNOVATION

Z. Georganta

The course examines the preconditions for innovation, as well as the environment in which it is developed. Today, within the globalization framework, innovation is the key to promote competitiveness and create national competitive advantage. The course includes the following topics: 1. Concept and business environment of innovation. Technical change and innovation (concept, measurement and interpretation). 2. Development of innovative ideas and new products. 3. The Schumpeterian model. 4. R and D models. 5. The Greek and EU experience in **comparison** with the international one.

G.6. MARKETING INFORMATION SYSTEMS

M. Vlachopoulou

Subject: The strategy, application and implementation of information Systems and New Technologies in marketing.

Content: Overview of marketing information systems (MAIS), users and the sources of marketing information. MAIS and processes. Marketing research. Marketing decision support systems, marketing models, what – if analysis. Expert systems in marketing decisions. Marketing-mix and marketing operations implementing MAIS and information technology. Database Marketing. The role of Geographic Information Systems (GIS), marketing applications of GIS. Electronic identification and data collection systems (bar codes, EPOS, smart cards). The marketing potential of multimedia. Marketing and Internet (online marketing).

G.7. INFORMATION SYSTEMS SECURITY

I. Mavridis

The course aims to provide an understanding of the fundamental concepts and issues, the basic techniques and new developments in information

systems security. Introduction – Basic Concepts, Risk analysis, Security policies and models, Access control, Database security, Computer security, Basic cryptography and applications, Public key infrastructures, Internet applications security.

G.8. TEACHING METHODS II

D. Mpousioiu

Instructional objectives (Bloom's taxonomy). Teaching models and adaptation of teaching methods in economics and social studies. Coordination of teaching methods and aids. Pre-conceptions and misunderstandings in the content of subjects in secondary and higher education with emphasis on basic principles. Application in teaching and analysis of economic issues with emphasis on the use of Computer.

G.9. COMMUNICATION I

Visiting Professor

In post-industrial (or postmodern) society, technological innovation constitutes an essential factor of continuous and spectacular changes (such as automation, massive presence of networks, continuous collapse of social representations concerning work, leisure, cognition etc.), while Social Sciences often fail to interpret actual reality.

New Technologies are considered as the cause of "social change", although Technology interferes in a concrete social system (where social choice is determinant). A general idea taken as "given" (as for instance the thesis that technological progress means social progress as well) can be proved to be a simple mythology. This course analyzes the relationship between society and technology especially in the domain of communication technologies (the idea of communication becoming a dominant nowadays reference): Mass Media, Telecommunications and Informatics.

G.10. PARALLEL PROCESSING

K. Margaritis

Subject: Design of parallel algorithms, parallel programming.

Content: Introduction to parallel processing (Hardware and Software issues). Data parallelism. Shared memory computer systems architecture. Process communication. Data sharing. Synchronous parallelism. Distributed memory computer systems architecture. Message passing programming techniques. Data partitioning. Replicated workers. Distributed termination.

G.11. MODELS OF QUALITATIVE VARIABLES

Z. Georganta

The course is developed along both theory and empirical applications. It includes the following topics: 1. Maximum Likelihood Estimation. 2. The use of

likelihood in econometrics. 3. Probabilistic – choice models. 4. LISREL models. 5. Empirical applications for social sciences.

G.12. SPECIAL TOPICS ANALYSIS OF ALGORITHMS (NP – Completeness)

G. Alexouda, Visiting Professor

Subject:

Content:

G.13. TIME SERIES ANALYSIS

D. Papanastasiou

Definition and examples of Time Series (TS). Stationarity. Autocorrelation function and spectral density of a series. TS forecasting techniques (exponential smoothing, Holt-Winters, etc). ARIMA models: Definitions, properties, identification, estimation, diagnostic checking and forecasting. The State Space Model and the Kalman filter. Estimating and forecasting TS models cast in State Space Model. Special problems (missing values, outliers, etc). Experience with analyzing and forecasting real life (economic) series.

G.14. COMPUTER INTENSIVE STATISTICAL METHODS

D. Papanastasiou

Subject: The aim of the course is to introduce the students to the basic concepts and potential fields of application of the bootstrap, jackknife and cross-validation techniques. The course also comprises an introduction to the S-Plus statistical programming environment.

Content: Introduction to S-Plus: Creating objects (vectors, arrays, frames), manipulation of objects, graphics construction, operations, creation of functions, interaction with FORTRAN and C. Statistical Methods: Basic concepts of the bootstrap technique, estimation of bias and standard error. Parametric and non-parametric bootstrap. Estimation of quantiles, confidence intervals, t-statistics, hypothesis testing. Applications on regression analysis and dynamic models. Jackknife bias and standard error estimation. Model selection by cross-validation.

G.15. PROGRAMMING LANGUAGES

G. Evagelidis

Subject: Compilers: Principles, Techniques and Tools.

Content: Introduction to Compiling. Lexical Analysis (Automata, Regular Expressions). Syntax Analysis (Context-Free Grammars). Syntax – Directed

Translation. Type Checking. Run-Time Environments. Intermediate Code Generation. Code Generation. Code Optimization.

H.1. INTERNET PROGRAMMING

M. Satratzemi

Subject: Design and implementation of Internet and Web based applications.

Content: Internet, Web, hypertext and HTML. Hyperlinks, formatting, images, tables, frames, image-maps. Design, organization and implementation of Web sites. Forms and CGI scripts. Dynamic HTML. Style sheets. Introduction to Java and JDK. Objects and classes, usage of fields and buttons. Control frames, scrolling bars, menu and dialog windows, graphics, animation and special effects. Database connectivity. Active server pages.

H.2. SOFTWARE ENGINEERING

Al. Chatzigeorgiou

Subject: Software Engineering Concepts and Techniques.

Content: Basic Concepts. Life Cycle models. Requirements Analysis. Structured Analysis (Yourdon). Process-Oriented Software Development (Analysis and Design). Coding – Testing. Software Documentation. Software Metrics. Object – Oriented Analysis and Design. UML and C++ examples. Object-Oriented Software Development.

H.3. MATHEMATICAL PROGRAMMING

K. Paparizos

Introduction to linear programming. Who are linear programming, the model, applications, and some historical notes. Forms of a 1p (canonical standard), Transformations, Geometry (improvement directions, the space of variables, the space of constraints), Inverse matrix. A condition of optimality, common characteristics of simplex algorithms, the criss-cross algorithm (description, correctness, geometry), Revised forms. The dual problem, economic interpretation, relations of the primal and dual problem. Primal simplex algorithms (description, correctness, geometry, two-phase method, big M method), Dual simplex algorithm (description, correctness, geometry, big M method). Sensitivity analysis (geometric interpretation, changes in the cost vector, adding a new variable, changes in the RHS vector, adding a new constraint, changes in the coefficient matrix), Parametric analysis (geometric interpretation, parameterization of the cost vector, parameterization of the RHS vector. Paparizos' exterior point algorithm, Paparizos' primal dual algorithm, and the homotopic algorithms. Modeling techniques, application, Implicit enumeration algorithm, Branch and bound algorithm, heuristics (genetic algorithms, simulated annealing).

H.4. ARTIFICIAL INTELLIGENCE AND EXPERT

SYSTEMS

I. Refanidis

Description: This course introduces the fundamental concepts and techniques of artificial intelligence (AI).

Topics: History of artificial intelligence. Goals and weaknesses. Philosophical questions. Areas of artificial intelligence. Problem representation and solving. Search algorithms. Two-player games. Constraint satisfaction. Knowledge representation. Uncertainty and Fuzziness. Planning. Machine learning. Natural language processing. Machine vision. Robotics. Expert systems. The CLIPS shell.

ELECTIVE COURSES

H.5. DECISION SUPPORT SYSTEMS

G. Alexouda, Visiting Professor

Structure of decision support systems, Development of decision support systems, Types of decision support systems, Model bases, What if analysis, Solvers, Probabilistic models, Decision trees, Multi-objective decision making, Heuristic methods, Modeling languages.

H.6. ELECTRONIC COMMERCE

M. Vlachopoulou

Subject: The strategy, application and implementation of Electronic Commerce (EC), Technology, business, and market perspective.

Content: Electronic Commerce perspectives, Technology underpinnings, impact on information systems within a business, impact on business design and strategy, impact on the industries and markets. The Internet, Internet tools. The World Wide Web. The E-commerce environment: New Business Models, changing business on the Internet, steps to create and implement EC strategy, Information Systems and integration of EC components, EC offering strategic advantages. Virtual organizations/enterprises. Overview of E-commerce technologies. E-mail for E-commerce, Intranets and Extranets, Software agents, EDI, Consumer E-commerce, Web Page Design. Electronic cash and electronic payment schemes. Security and legal issues. Electronic Marketing (on – line marketing). Electronic banking (internet banking).

H.7. COMMUNICATION II

Visiting Professor

Communication is the “matrix” in which are structured all human activities (as has remarked Cl. Levi-Strauss) in any society (although postmodern society is thought to be more “communicative” than others (because of the development of the media). This course analyzes a certain number of communication dimensions (from a sociological point of view) such as:

The meaning of communication, language, signs and symbols, the role of Technology; understanding, Artificial Intelligence, Cognitive Science, mass communication, mass cultural models, mass media, cultural industries, communication in the networks, appearance of new sociability’s, “postmodern” communication.

H.8. MANAGEMENT OF DATA PROCESSING PROJECT

G. Haramis, Visiting Professor of dep. Business Administration

Special topics on the development of application systems (i.e. fourth generation languages, introduction to CASEs, quality assurance reviews etc.). Aims to provide the students with experience in analyzing, designing, implementing and evaluating information systems.

H.9. COMPUTER INTEGRATED MANUFACTURING (CIM) SYSTEMS

St. Vougioukas, Visiting Professor

- 1) Introduction to CIM concepts: History of Manufacturing Systems, Basic concepts and terminology, basic manufacturing system functions
- 2) Computer Aided Design (CAD): Geometric modeling and representation methods, CAD interfaces
- 3) Computer Aided Process Planning (CAPP): Variant and Generative approach, Group Technology, Coding Systems, Feature extraction and classification
- 4) Computer Integrated Manufacturing (CIM): CNC machines, Architectures, CNC programming
- 5) Robotic Systems: Kinematics, Dynamics, Control, Path and Trajectory planning, Programming, Applications
- 6) Production Planning: Demand Forecasting, Material Requirements Planning (MRP), Capacity planning, order release, shop-floor control

H.10. NEURAL NETWORKS

I. Refanidis

Description: This course introduces those methods of artificial intelligence, which solve problems by emulating biological processes: neural networks and genetic algorithms.

Topics: Non-symbolic artificial intelligence. Machine learning. Artificial neurons. Supervised learning. Perceptron. The delta rule. Feed-forward networks. Multilayer networks and error back propagation. Recurrent networks. Hopfield network. Unsupervised learning. Kohonen network. Genetic algorithms. Encodings. Fitness function. Crossover and mutation. Examples and applications.

H.11. LOGISTICS INFORMATION SYSTEMS

V. Manthou

Objective: Logistics Information Systems and their importance in the contemporary enterprise

Contents: The role of Logistics Information Systems in a global economy. Views of global logistics-Supply Chain. Steps for the design and analysis of a logistics information system. Effect of Logistics Information Systems in business processes.

H.12. COST ACCOUNTING

St. Tsopoglou – A. Vazakidis

The nature and concepts of cost and cost accounting. Cost terms and classifications (fixed and variable cost). Product cost accumulation systems (job-order and process costing). Cost centers. Full and variable costing. Historical and standard costing. Price and cost decision making. Software applications for cost accounting.

H.13. OPERATIONS RESEARCH METHODS

A. Valaristos, Visiting Professor

Subject: Deterministic and stochastic models of Operations Research.

Content: Queuing Theory: Introduction – Examples, basic structure and characteristics of a queuing model, terminology, Arrival and Service processes (Poisson and exponential distributions), basic systems and queuing networks, Birth-Death processes, optimality of queuing systems. Dynamic Programming: Characteristics of dynamic programming, resource allocation problems, forward and backward recursions, stochastic dynamic programming.

H.14. DISTRIBUTED SYSTEMS

K. Margaritis

Subject: Design, implementation and management of distributed systems.

Content: Distributed systems architectures, relation with OSI communication model. Client server model and some implementations (Unix sockets, Remote Procedure Call). Threads and their applications. Examples of distributed operating systems. Distributed file systems and distributed database systems (ODBC, COBRA). Distributed information systems. Internet, Intranets and World Wide Web applications.

H.15. ADVANCED TOPICS OF ECONOMETRICS

N. Dritsakis

Subject: The course aims to introduce the basic ideas of stationarity and cointegration of time series, as well as the determination of causality relationships.

Content: Time series econometrics, spurious regressions, stationarity of time series, stationarity tests (autocorrelation coefficients, unit roots), integrated time series, unit root tests (D-F test, augmented D-F test, selection of time lags (Akaike information criterion, Schwartz Bayesian criterion), error correction mechanism estimation, determination of the order of cointegration, estimation of VAR model, determination of causality relationships.

H.16. SOUND PROCESSING

A.Manitsaris

Subject:

Content:

H.17. DIGITAL VIDEO PROCESSING

Th. Papadimitriou, Visiting Professor

Subject: Digital Video Fundamentals.

Content: Properties of a video sequence. Differences between analogue and digital image sequences. Camera models. Creation of a digital image sequence. 2d and 3d motion estimation techniques. Motion segmentation. Video enhancement (linear filters). Introduction to video compression techniques. Compression standards: MPEG – 2 and MPEG – 4. High Definition TV (HDTV). Unstable networks video transmission.