UNIVERSITY OF THE AEGEAN

ENVIRONMENTAL CARTOGRAPHY

EXTENDED UNIVERSITY PROGRAM

SUMMER SCHOOL COURSES

ACADEMIC YEAR 1998-1999

FIRST ANNOUNCEMENT
FEBRUARY 1999

MYTILENE, LESVOS, GREECE

HEAD & ACADEMIC DIRECTOR

Professor Ioannis Hatzopoulos

ASSOCIATE HEAD

Professor Andreas Troumbis

MODULE RESPONSIBLE FACULTY

Professor Ioannis Hatzopoulos

Professor Andreas Troumbis

Assist. Professor Ioannis Spilanis

Assist. Professor Yiannis Matsinos

Lecturer Nikolaos Soulakellis

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UNIVERSITY OF THE AEGEAN
ENVIRONMENTAL CARTOGRAPHY
EXTENDED UNIVERSITY PROGRAM

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EXTENDED UNIVERSITY PROGRAM ON "ENVIRONMENTAL CARTOGRAPHY"

The Extended University Program (EUP) on Environmental Cartography started during the 1998-1999 academic year in the University of the Aegean, Mytilene, Greece, as a part of significant innovations in the Greek Higher Education system, with a general goal to develop University departments focusing on new subjects and/or interdisciplinary fields. The Greek Ministry of Education & Religious Affairs funds the EUP Environmental Cartography through the Operational Program for Education and Initial Training (EPEAEK) of the European Community. The academic program runs under the auspices of the Department of Environmental Studies, in cooperation with the Department of Geography of the University of the Aegean. Participants in the above endeavor are 4 French Universities (Universite de Bretagne Occidentale, Universite de Corse, Universite de Aix-Marseille III, and Universite de Paris VI) and a large number of faculty from Europe, North America and Australia.

The EUP on Environmental Cartography operates with the same quality standards of the existing academic programs of the University of the Aegean, in a supplementary direction. However, there are important differences and innovations compared to the "traditional" academic programs of the Greek Universities.

Admission to the Extended University Program is open to Greek and international students regardless of their age, holders of high school diploma or University/Technological degree from Greece or abroad. Student admission to the Extended University Program is based on specific evaluation criteria (e.g., graduation and individual courses grades, post-high school education and professional experience), determined by State Laws and specialized by the University. **The degrees offered are fully equivalent to degrees granted by respective Universities in Greece.** Courses are being offered during the whole calendar year in three periods — winter, spring and summer.

The Environmental Cartography academic program consists of distinctive study modules leading to a regular 4-year University degree, or the option of partial enrollment at one or more modules or individual courses that awards study certificates. The program has been organized in the following eight (8) modules:

1. Cartography
2. Geographic Information Systems
3. Remote Sensing
4. Photogrammetry
5. General Education
6. Planning for Nature Conservation
7. Quantitative Ecological Methods
8. Island Development Planning and Integrated Management.

Each module is related to specialization fields appealing to the job market that stand at the edge of modern science and technology. Despite specialized courses offered separately in various Universities throughout Greece, these courses elsewhere are not offered as a whole to formulate an independent, flexible and uniform program of studies focused at such specialization fields. The above fields in the EUP Environmental Cartography are well-organized structural elements that enable even University graduates willing to complement their skills and knowledge to enroll at certain modules or single courses. Such modules and courses are offered at regular intervals and duration designed to provide easy access to life-long education.

The **Summer School** is also considered an important step, enabling Greek and foreign students to enroll in intensive courses taught during the summer session. **Summer courses are offered in Greek, English and French** by established professors and other scientists of the Extended University Program, who are also invited as guest lecturers from cooperating Greek and foreign Universities.

The field of Cartography is related not only to areas like mapping of increased communication efficiency, but also extents in areas with large production of cartographic information such as Photogrammetry and Remote Sensing as well as fields of data management and utilization in Geographic Information Systems. These fields, **along with their Environmental Applications**, are based on the development of high technology and thus representing advancing areas in an increasingly demanding job market.

Environmental Cartography applications are highly demanded in Greece and world-wide, creating an ideal academic environment for student exchanges from Europe and regional countries of Asia and Africa. In addition, the constant technological developments in these areas require life-long learning for those who are on the professional field or aim to work in such subjects.

The success of the Environmental Cartography program is based upon the quality of its personnel, the proper organizational and study planning, its international dimensions and faculty, as well as the support of the local community**.**

CURRICULUM STRUCTURE AND SUMMER COURSES

The program of studies has a modular structure composed of the following eight (8) modules and their respective faculty responsible:

1. CARTOGRAPHY
Faculty Responsible: *Lecturer Nikolaos Soulakellis*
tel: +30 251 36412, fax:+30 251 23783, e-mail: n.soulakellis@geo.aegean.gr

2. GEOGRAPHIC INFORMATION SYSTEMS (GIS)
Faculty Responsible: *Lecturer Nikolaos Soulakellis*
tel: +30 251 36412, fax: +30 251 23783, e-mail: n.soulakellis@geo.aegean.gr

3. REMOTE SENSING
Faculty Responsible: *Professor Ioannis Hatzopoulos*
tel: +30 251 36211, fax: +30 251 42849, e-mail: ihatz@env.aegean.gr

4. PHOTOGRAMMETRY
Faculty Responsible: *Professor Ioannis Hatzopoulos*
tel: +30 251 36211, fax: +30 251 42849, e-mail: ihatz@env.aegean.gr

5. GENERAL EDUCATION

6. PLANNING FOR NATURE CONSERVATION
Faculty Responsible: *Professor Andreas Troumbis*
tel: +30 251 36230, fax: +30 251 41647, e-mail: atro@env.aegean.gr

7. QUANTITATIVE ECOLOGICAL METHODS
Faculty Responsible: *Assist. Professor Yiannis Matsinos*
tel: +30 251 36228, fax: +30 251 36298, e-mail: gmats@env.aegean.gr

8. ISLAND DEVELOPMENT PLANNING AND INTEGRATED MANAGEMENT
Faculty Responsible: *Assist. Professor Ioannis Spilanis*
tel: +30 251 36229, fax: +30 251 23783, e-mail: gspi@env.aegean.gr

The following courses will be taught during the summer session of the academic year 1998-1999, in the period time indicated in each module or course respectively.

1. CARTOGRAPHY

Faculty Responsible: *Lecturer Nikolaos Soulakellis*

A.2. Thematic Cartography

(2nd – 7th August 1999)

Instructor: *M. Tsakiri, Curtin University of Technology, Australia*

History of Cartography with emphasis in Thematic cartography, Methods of thematic data selection, Cartographic symbols, Atlases, Temporal, Dynamic and Electronic maps.

A.3. Automated Cartography

(16th – 26th July 1999)

Instructor: *M. Papadopoulou, Aristotle University of Thessaloniki, Greece*

Automation and Cartography, raster and vector format, digital cartographic data bases, coordinate transformation, digital processing of cartographic data, cartographic generalization and digital map design and production.

A.4. Special Topics in Cartographic Applications

A.4.1. Maps of General Use – National Defense Maps

(15th June – 15th July 1999)

Instructor: *G. Halaris, Army Geographic Agency, Greece*

Introduction, coordinate reference systems, datum transformations, the GPS system and its use for mapping purposes in Greece. Maps for general use, technical aspects, analysis of map information. How to read a map. The mapmakers in Greece. National Defense maps and their characteristics.

A.4.2. Meteorological Maps

(26th – 30th July 1999)

Instructor: *G. Kallos, National and Kapodistrian University of Athens, Greece*

Introduction to Atmospheric Science and meteorological mapping, evaluation of meteorological data, design and production of meteorological maps according to international standards.

A.4.3. Geological - Geomorphological Maps

(1st July – 10th August 1999)

Instructors: *M. Stefouli, Institute of Geology and Mineral Exploration, Greece*
N. Zouros, Natural History Museum of the Lesvos Petrified Forest, Greece

History of Geological Mapping, Methods of geological data selection, Cartographic symbols in Geological and Geomorphological Maps, Geological Atlases, Digital Geological and Geomorphological Maps.

NOTE

Admission to the courses is open to University/Technological Institute graduates and students, professionals from industry/companies/agencies, and other holders of high school diplomas with knowledge of English, Mathematics and Informatics. For further information, candidates should contact the module's responsible faculty.

2. GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Faculty Responsible: *Lecturer Nikolaos Soulakellis*

B.2. Geographic Data Base Design

(15th June – 15th July 1999)

Instructor: *G. Halaris, Army Geographic Agency, Greece*

Basic data base concepts, use of a DBMS in the GIS environment. Basic design concepts, views in a data base. Data base elements, the architecture of GIS data bases. Types of GIS data bases, various implementation models, examples. The methodology for data base normalization. The current trends in data base design.

B.3. Special Operations in GIS

(15th June – 15th August 1999)

Instructor: *N. Soulakellis, University of the Aegean, Greece*

Principles of GIS, special operations in GIS, spatial analysis of geographical data, network analysis, D.E.M.s, integration with digital satellite image analysis and interpretation.

B.4. Special Topics in GIS Applications

B.4.1. Aquatic Ecosystems

(14th June – 15th July 1999)

Instructors: *M. Aggelidis and M. Aloupi, University of the Aegean, Greece*

Applications of GIS on data analysis for the description of aquatic ecosystems, survey of pollution sources compilation and presentation of management scenaria, presentation of case studies.

B.4.2. Land Cover

(23rd August – 5th September 1999)

Instructor: *M. Karteris, Aristotle University of Thessaloniki, Greece*

GIS applications to monitoring of land use and land cover classification on non-urban areas, agricultural areas, and vegetation- and soil-types.

B.4.3. Environmental Planning

(15th June – 15th July 1999)

Instructor: *H. Kokkosis, University of the Aegean, Greece*

GIS applications to the detection and monitoring of: land use of urban areas, areas of structured environment and areas of dynamic potential for development. Detection and monitoring of: house construction activities and tourist developments.

B.4.4. Natural Hazards

(30th June – 10th July 1999)

Instructors: *P. Delladetsimas and K. Kalabokidis, University of the Aegean, Greece*

Applications of GIS in natural risk management. Proactive planning and effects mitigation of earthquakes, wildfires and extreme hydrological phenomena. Current issues and perspectives.

B.4.8 Spatial Statistics

(21st June – 2nd July 1999)

Instructor: *P. Kanaroglou, McMasters University, Canada*

This course provides an introduction to the concepts and methods in spatial statistics, using the software packages S-Plus and ArcView. The general topics covered include the analysis of: Point Patterns, Spatially Continuous Data, and Area Data. Students are required to have knowledge in basic applied descriptive and inferential statistics.

NOTE

Admission to the courses is open to University/Technological Institute graduates and students, professionals from industry/companies/agencies, and other holders of high school diplomas with knowledge of English, Mathematics and Informatics. For further information, candidates should contact the module's responsible faculty.

3. REMOTE SENSING

Faculty Responsible: *Professor Ioannis Hatzopoulos*

T.2. Digital Images – Processing Algorithms – Classification

(19th – 31st July 1999)

Instructor: *M. Tsakiri-Strati, Aristotle University of Thessaloniki, Greece*

Relationships of object points and corresponding geometric locations of image shades, digital encoding and standard image formats. Algorithms for: atmospheric and geometric corrections, radiometric enhancement, filtering, Fourier transform, principal components, classification, regression. Algorithms of radar images, height extraction through interferometry. Statistical processing and reliability estimation.

T.3. Photo-Interpretation – Expert Systems – Linear Correlation

(16th – 20th August 1999)

Instructor: *L. Toulios, National Agricultural Research Foundation, Greece*

Anatomy of the mechanism eye – brain. Rules of Photo-interpretation and associated problems. Photo-interpretation keys and stereograms. Geometric and wave properties of features for automatic extraction. Correlation algorithms to compare standard feature images to image windows. Statistical processing and reliability estimation.

T.4. Special Topics in Remote Sensing Applications

T.4.2. Land Cover Classification

(23rd August – 5th September 1999)

Instructor: *M. Karteris, Aristotle University of Thessaloniki, Greece*

Remote sensing applications to the detection, recording and monitoring of: land use land cover on non urban areas, agricultural areas, types of vegetation and soil types. Reliability analysis.

T.4.3. Environmental Planning

(15th June – 15th July 1999)

Instructor: *H. Kokkosis, University of the Aegean, Greece*

Remote sensing applications to the detection, recording and monitoring of: land use of urban areas, areas of structured environment and areas of dynamic potential for development. Detection, recording and monitoring of: house construction activities, and tourist developments. Reliability analysis.

T.4.4. Natural Hazards

(30th August – 5th September 1999)

Instructors: *M. Karteris, Aristotle University of Thessaloniki, Greece*
K. Kalabokidis, University of the Aegean, Greece

Applications of Remote Sensing in natural risks management. Proactive planning and effects mitigation of earthquakes, wildfires and extreme hydrological phenomena. Current issues and perspectives.

T.4.5. National Defense

(5th – 9th July 1999)

Instructor: *V. Karathanassi, National Technical University of Athens, Greece*

Course based on the application of digital image processing algorithms and techniques on remotely sensed imagery (multispectral and panchromatic), air-photos and SAR - Radar images, in order to detect objects of military interest e.g., bridges, tankers, camps, Radar locations, airports, swamps.

T.4.6. Meteorology and Climatology

(23rd August – 3rd September 1999)

Instructors: *V. Katsoulis, University of Ioannina, Greece*
D. Paronis, Centre d'Etudes de Saclay, France

Remote sensing applications to the detection, recording and monitoring of: clouds, vegetation index, land surface and sea surface temperatures, dust particle movement in the atmosphere. Reliability analysis.

T.4.7. Geology and Geomorphology

(1st July – 10th August 1999)

Instructor: *M. Stefouli, Institute of Geology and Mineral Exploration, Greece*

A comprehensive and integrated approach to remote sensing/GIS techniques that can be applied to the geologic research (basic mapping, mineral/hydro-geological exploration, and geomorphology). The course will take place in two separate units: the geologic remote sensing (image processing and analytical interpretation techniques) and the GIS (digital geospatial analysis in geologic mapping). Both remote sensing and GIS concepts are to be taught using a specialized image processing/GIS software package. The combination of these two methods of geologic research offers the opportunity for learning an integrated approach to the geo-spatial data management and analysis by combining the pieces of the geo-data puzzle together with a relational database.

T.4.8. Radiometry – Atmospheric Pollution

(6th – 10th September 1999)

Instructor: *N. Sifakis, National Observatory of Athens, Greece*

Theoretical topics of physical principles and radiometric principles of the signals that are recorded by the satellite sensors are covered. Related applications on corrections and calibrations applied to the satellite images are examined. Applications of atmospheric influences to the area of observation and monitoring of atmospheric pollution are developed.

NOTE

Admission to the courses is open to University/Technological Institute graduates and students, professionals from industry/companies/agencies, and other holders of high school diplomas with knowledge of English, Mathematics and Informatics. For further information, candidates should contact the module's responsible faculty.

4. PHOTOGRAMMETRY

Faculty Responsible: *Professor Ioannis Hatzopoulos*

P.2. Mathematical Bases – Aerial Triangulation

(15th – 30th July 1999)

Instructor: *P. Patias, Aristotle University of Thessaloniki, Greece*

Analytical photogrammetry: Coordinate systems, colinearity and coplanarity equations, atmospheric corrections, earth's curvature. Error propagation, sensitivity analysis of the system. Preparation for aerotriangulation, Aerotriangulation: with independent models, with simultaneous bundle block adjustment. Accuracy assessment.

P.3. Softcopy Photogrammetry – Orthophotography

(2nd – 13th August 1999)

Instructors: *P. Aggouri and A. Stefanidis, University of Maine, USA*

Digital cameras, scanner digitizing. Detection and correction of errors in digital images. Aerial photographs, space photographs and SPOT photography. Correlation models, algorithms. Generation of orthophotos and digital terrain models. Accuracy assessment.

P.4. Special Topics in Photogrammetric Applications

P.4.1. Photogrammetric Creation of Manuscript Map

(15th – 30th July 1999)

Instructor: *P. Patias, Aristotle University of Thessaloniki, Greece*

Preparations for the images and for the Photogrammetric instrument. Orientation of the Photogrammetric instrument. Manuscript construction for the areas: urban, agriculture, forest, coastal, highway routes. Generation of digital terrain models. GIS data transfer and interface. Manuscript accuracy assessment and testing.

P.4.2. Non-Topographic Photogrammetry - Industrial Applications

(7th – 13th June 1999)

Instructor: *C. Fraser, University of Melbourne, Australia*

Design of photogrammetric systems of terrestrial exposures of middle and close range distances. Applications on the determination of precise surface shape of objects and time series analyses of micro-movement of static object surfaces. Applications to: industry, architecture, archeology and anatomy. Accuracy assessment and analysis.

P.4.3. GPS Photogrammetry

(15th June – 15th August 1999)

Instructor: *R. Munjy, California State University, USA*

Mathematical analysis and computation of the camera exterior orientation elements from GPS measurements. Simultaneous bundle block adjustment of both Photogrammetric and GPS measurements. Minimal use of control points. Accuracy assessment and analysis.

P.4.4. Photogrammetric Mapping of Monuments

(16th – 21st August 1999)

Instructors: *E. Marmaras, University of the Aegean, Greece*
E. Stambouloglou, FOTOPO Ltd., Greece

Monuments and Sites of the world cultural heritage need a wide spectrum of studies in order to make possible their preservation, conservation and restoration. The geometric survey of the monument consists the first step for the monument documentation and is necessary for every next step. This survey is realized with combined methods and techniques of Photogrammetry, Topography and Topometry. This course contains the basics of the image geometry, Mono / Stereo-Photogrammetry, Methods and Instruments for the Survey of Monuments with example application.

P.4.5. Photogrammetric Mapping of Dynamic Objects and Robot Vision

(2nd – 13th August 1999)

Instructors: *P. Aggouri and A. Stefanidis, University of Maine, USA*
I. Hatzopoulos, University of the Aegean, Greece

Design of Photogrammetric systems for mapping of dynamic objects, using stereo images, and also using many images of converged configuration. Design of Robot vision system, orientation of the camera in the three dimensional space in real time. Synchronization of exposure mechanisms for simultaneous exposures. Image analysis and processing. Accuracy assessment and analysis.

P.4.6. Calibration of Cameras

(15th June – 15th August 1999)

Instructors: *C. Fraser, University of Melbourne, Australia*
I. Hatzopoulos, University of the Aegean, Greece

Calibration of cartographic cameras. Calibration of cameras for non topographic photogrammetry. Calibration of amateur cameras. Calibration of digital cameras and video cameras. Calibration of image scanners.

P.4.7. National Defense Applications

(15th June – 15th August 1999)

Instructors: *I. Hatzopoulos, University of the Aegean, Greece*
R. Munjy, California State University, USA

Photogrammetric mapping without the use of control points. High accuracy target mapping using multiple convergent images. Ultra high precision measurements on the shape of radar parabolic antenna.

NOTE

Admission to the courses is open to University/Technological Institute graduates and students, professionals from industry/companies/agencies, and other holders of high school diplomas with knowledge of English, Mathematics and Informatics. For further information, candidates should contact the module's responsible faculty.

5. GENERAL EDUCATION

E.1.1. General Mathematics

(1st – 20th June 1999)

Instructor: *Y. Matsinos, University of the Aegean, Greece*

Rate of change of functions, limits, continuity and derivatives of functions, applications of derivatives, integrals and their applications, hyperbolic functions, methods and formulae of integration, sequences and infinite series, vector functions and their derivatives, partial derivatives, multiple integrals, ordinary differential equations.

E.2.1. Computer Programming – Visual Basic

(14th – 18th June 1999)

Instructor: *I. Hatzopoulos, University of the Aegean, Greece*

Introduction to the computer systems. DOS and Windows operating systems. Introduction to Visual Basic, GUI. Elements and structures of the programming language. Programming with files and graphics.

E.2.3. Object-Oriented and Event-Driven Programming

(21st – 25th June 1999)

Instructor: *I. Hatzopoulos, University of the Aegean, Greece*

Introduction to Visual Basic, GUI. Managing corporate data. Tools and techniques. Internet programming fundamentals. Advanced database programming. Integration of a complete project.

E.6.1. Algorithmic and Mathematical Bases for Remote Sensing

(15th June – 15th August 1999)

Instructor: *I. Hatzopoulos, University of the Aegean, Greece*

Numerical methods, optimum algorithms. Error propagation law. The least squares method. Data simulation. Mathematical bases of remote sensing. Converting algorithms into programming language for: Geometric correction, radiometric enhancement, principal components.

E.6.2. Algorithmic and Mathematical Bases for Photogrammetry

(15th June – 15th August 1999)

Instructor: *I. Hatzopoulos, University of the Aegean, Greece*

Numerical methods, optimum algorithms. Error propagation law. The least squares method. Data simulation. Mathematical bases of Photogrammetry, linearization of projective equations. Converting algorithms into programming language for: Lens distortion, transformation of image coordinates, simulation of images from DTM, space resection and intersection, relative and absolute orientation.

E.6.3. Algorithmic and Mathematical Bases for Cartography and GIS

(15th June – 15th August 1999)

Instructor: *I. Hatzopoulos, University of the Aegean, Greece*

Numerical methods, optimum algorithms. Error propagation law. The least squares method. Data simulation. Mathematical bases of GIS. Converting algorithms into programming language for: Digital map, digital terrain model (DTM), automatic contouring, perspective view.

NOTE

Courses E.1.1 and E.2.1 have no prerequisites, whereas enrollment to E.2.3 course requires knowledge of a computer programming language. Admission to courses E.6.1 – E.6.3 is open to University/Technological Institute graduates and students, professionals from industry/companies/agencies, and other holders of high school diplomas with knowledge of English, Mathematics and Informatics. For further information, candidates should contact the Academic Director Prof. Ioannis Hatzopoulos.

6. PLANNING FOR NATURE CONSERVATION

Faculty Responsible: Professor Andreas Troumbis

(Period: 1st – 31st July 1999)

N.1. Biology of Small Populations

Instructor: *D. Couvet, Museum National d'Histoire Naturelle, France*

Because of rapid and increased insularization of remaining patches of suitable living space, the study of the ecology of small populations is of vital importance for the conservation of many species. Small populations are challenged by a number of factors that increase the likelihood of population going extinct simply because of the population size.

Why Study Small Populations? Genetics (Inbreeding, Genetic Variation), Demography, Spatial Consideration, Survival and Extinction of Small Populations, Modeling: Population Viability Analysis and Minimum Viable Populations.

N.2. Definition, Measurement and Estimation of Biodiversity

Instructors: *R. Barbault, Université Pierre et Marie Curie, Paris VI, France*
J. Lawton, Imperial College of Science, Technology and Medicine, Great Britain

Levels of Biodiversity, Patterns in Biodiversity, Extinctions, Patterns of Species Vulnerability (Rare, Keystone), Quantification of Biodiversity at Different Organisational Levels of Life (Gene, Species, Community and Ecosystem, Landscape, Biome).

N.3. Landscape Ecology

Instructors: *R. Jongman, Wageningen Agricultural University, Netherlands*
T. Akriotis and T. Terkenli, University of the Aegean, Greece

Landscape Structure: Patches, Corridors, Matrix and Network Overall Structure, Landscape Dynamics: Natural Processes in Landscape Development, The Human Role in Landscape Development, Flows Between Adjacent Landscape Elements, Animal and Plant Movement Across a Landscape, Landscape Functioning, Landscape Change, Heterogeneity and Management: Heterogeneity and Topology, Landscape Management

N.4. Island Biogeography and Conservation Planning

Instructors: *F. Sarrazin, Université Pierre et Marie Curie, Paris VI, France*
H. Freitas, University of Coimbra, Portugal

Biogeography: The Analysis of Historical and Ecological Explanations of the Geographic Distribution of Organisms, The Theory of Island Biogeography, Predictions and Critiques of the Theory, Diversity and Reserve Design, Population Vulnerability Analysis and Minimum Viable Populations, Habitat and Nature Reserve Size, The SLOSS Debate, Management of Nature Reserves.

N.5. Conservation Biology

Instructors: *R. Barbault, Université Pierre et Marie Curie, Paris VI, France*
H. Freitas, University of Coimbra, Portugal

What Is Conservation Biology? Conservation Values and Ethics, The Species in Conservation, Population-Level Considerations: Genetics - Conservation of Diversity within Species, Demographic Processes - Population Dynamics on Heterogeneous Landscapes, System-Level Considerations: Community and Ecosystem-Level Conservation - Species Interactions, Disturbances Regimes, and Invading Species, Habitat Fragmentation, Conservation Reserves in Heterogeneous Landscapes, Practical Applications and Human Considerations: Management to Meet Conservation Goals - General Principles and Applications, Conservation Management Case Studies, Ecological Restoration.

NOTE

For specific module requirements and prerequisites, please contact Professor Andreas Troumbis, Faculty Responsible, e-mail: *atro@env.aegean.gr*

7. QUANTITATIVE ECOLOGICAL METHODS

Faculty Responsible: Assist. Professor Yiannis Matsinos

(Period: 1st – 31st July 1999)

Z.1. Ecological Modeling

Instructor: *M. Loreau, Université Pierre et Marie Curie, Paris VI, France*

The course will cover the basic theory for developing and use of mathematical models in ecology, emphasizing in large-scale applications, like ecosystem processes. After an introduction to the basic approaches, the course will concentrate on models of species interactions, and the role of biodiversity on key ecosystem processes.

Z.2. Biostatistics

Instructor: *B. Schmidt, University of Zurich, Switzerland*

Design and Analysis of Ecological Experiments. The main objective of this course is to couple the design of ecological experiment with the appropriate statistical inferential analysis along four basic components: hypotheses, data, goodness of fit, statistical models. Basic statistical techniques (regression, general linear models) will be covered and a number of projects with the use of SPSS and S-Plus will be assigned.

Z.3. Quantitative Landscape Ecology

Instructor: *Y. Matsinos, University of the Aegean, Greece*

The role of spatial variation in structuring population patterns. Basic dynamic simulation models will be presented dealing with spatial issues (patch occupancy models, cellular-based landscape models, structured metapopulation models, individual-oriented spatial models). Hands on experience for the class with the use of projects in RAMAS and ECOBEAKER computer laboratories.

Z.4. Statistical Ecology (Seminar)

Instructors: *B. Schmidt, University of Zurich, Switzerland*
Y. Matsinos, University of the Aegean, Greece

The seminar will focus mainly on two subjects: applied multivariate techniques for ecology, and statistical modeling. Emphasis will be given in linking models with data, integration of modeling with statistics, in the cases where multiple hypotheses have to be considered.

Z.5. Mathematical Population Ecology

Instructor: *V. Jansen, University of Oxford, Great Britain*

The course will examine the role of space in population attributes like persistence, and stability with the use of mathematical models. Topics include: Persistence of populations in stochastic patchy environments, The role of space in preventing predator-prey cycles, Evolution in metapopulations, The effects of dispersal on population dynamics and evolution of migration rates.

NOTE

For most of the module courses the prerequisites are calculus, basic statistics and computer literacy. For specific course requirements please contact: Assist. Professor Yiannis Matsinos, Faculty Responsible, e-mail: *gmats@aegean.gr*

8. ISLAND DEVELOPMENT PLANNING AND INTEGRATED MANAGEMENT

Faculty Responsible: Assist. Professor Ioannis Spilanis

The courses are organized by the Laboratory of Regional and Island Development of the University of the Aegean in collaboration with the Universities of Corse and Bretagne. These courses aim to provide the knowledge that will enable, through tracking and analysis of the specific features of the islands, the inspection of any developing potentials and the identification of specific management problems deriving from them. The display and analysis of the close – and often contradictory – relation between development and environment will favor an approach towards integrated management of areas through the aspect of sound development.

The island however, due to its small size and complexity, may be considered as a small-scale world in which one may observe the emergence of all kinds of phenomena of the rest of the world interrelated at the economic, social, environmental and cultural field. On the other hand, it is quite clear as intense the engagement between local and global (regional, national and world) system. Due to the clear differentiation of its limits, if compared to the rest of the world, an island's advantage is that it can be considered as a laboratory, prone to observation of complex systems functions. Thus, any conclusions extracted and instruments developed from the study of islands can be of general interest and broad application.

The goal of the module's courses is to improve, through a series of lectures, the acquired knowledge and scientific skills of the participants to applications related to the strategic development planning and integrated management of areas. These lectures relate to basic theoretical questions, presentations of specific issues by specialists, field works and presentations of student assessments.

H.1. Island Development and Planning

Instructors: *I. Spilanis, University of the Aegean, Greece*
T. Anthopoulou, Panteion University, Greece
S. Avgerinou, National Technical University of Athens, Greece
A. Meistersheim and M. Biggi, Université de Corse, France

Given the fact that island areas of the European Community are considered among the less developed regions, a systematic examination of the causes and a radical innovative confrontation of the problem are needed using contemporary theoretical approaches to regional development.

The course subjects are:
- From development to sustainability
- The island as a system
- Island specific characteristics and their implications: Island Typology – The Concept of Insularity
- The European islands in the process of Economic and Monetary Unification
- Rural development and island area: the concept of handicapped areas
- Potentials and limits in the development of tourism
- New services and innovative actions
- Demographic tendencies and the role of manpower to the developing process
- Development planning and programming.

H.2. Management of Resources and Wastes

Instructor: *K. Halvadakis, University of the Aegean, Greece*

Management of water and waste problems (liquid and solid) is usually problematic due to the limited amount of water and the lack of main-land for waste disposal. The fluctuation of the population poses an additional management situation to evaluate.

Modern approaches impose the need to leave behind interventions which aim to lessen the impact of wastes to the environment (interventions of first generation – end of pipe) in order to undertake methods towards a more effective use of resources, reduction to the production of wastes (interventions of second generation – improvement of environmental performance), and towards methods that contemplate the use of resources through an integrated approach to sustainable development.

H.3. Management of Island Environment

Instructors: *F. Bioret and L. Brigand, Université de Bretagne Occidentale, France*
A. Troumbis, H. Giourga and A. Meliadou, University of the Aegean, Greece

The integrated management of ecosystems, with emphasis on the conservation of areas with particular ecological value (i.e. Natural zones), constitutes the specific goal of this course.

An identification of the challenges confronted by the islands and isles is undertaken, based on the presentation of special cases, in questions raised on nature management and conservation. Such cases are formed by the abandonment of the traditional activities and methods of environmental management, the over-grazing and nature degradation, tourism development and its implications to the environment, wealth and fragility of island ecosystems.

H.4. Databases for Island Planning

Instructors*: I. Spilanis, University of the Aegean, Greece*
M. Biggi, Université de Corse, France

Analysis of qualitative and quantitative data fitted to the needs of planning. Methodology on identifying the suitable information. Examples on the difficulties for quantitative data in order to describe socio-economic and environmental phenomena. Presentation of GRISLES and EURISLES databases – Comparisons between Greek and European islands.

MODULE ORGANIZATION

Place:	*Serifos (Kyclades)*
Period:	25th August – 12th September 1999
Number of participants:	30 (15 Greek citizens and 15 French-speaking)

Intended for:

This study module is intended for University graduates, primarily to those studied regional development and land planning, e.g., Urban and Regional Development, Geography, Environmental Land Planning, Architecture, Surveying; upper-level University students are also accepted. In addition, the courses aim at Public Administration and Local Government employees, as well as to consultants with experience on the field.

Selection:	Selection is based on the curriculum vitae, attached to the relative application form
Evaluation criteria:	Education (subject, grades) Research experience Relative professional experience Level of knowledge of foreign languages (English, French) Topic of course assignment-presentation
Registration fees:	100000 GRD or 300 EURO (this amount does not include travel and living expenses)

Organization of courses:

This module's program is organized around a series of lectures, presentations of student assignments, fieldwork and teamwork.

Lectures will be given in Greek and French.

The schedule of common activities is between 9:00 – 13:00 & 17:30 – 20:30 hours. The distribution of the classes as well as the schedule of the lectures will be delivered to candidates at the beginning of the Summer School.

Certificates granted:

- Attendance certificate
- Completion certificate provided that assignments, participation to teamwork and generally to course activities have been considered satisfactory by the instructors.

For more information please contact the Laboratory of Local and Insular Development
- address: University of the Aegean, 17 Karadoni str., GR-81100 Mytilene, fax +30 251 36009
- e-mail: *gspi@aegean.gr*

Application Procedures and General Information

Admission

Admission to Summer School is open to Greek citizens and international students, according to specific conditions as noted for each module.

Enrollment

Candidates to the Summer School should submit the Registration Form, found at the end of this brochure, to the Secretariat of the Extended University Program. **The application deadline is April 30, 1999.**

Fees

Registration fees apply for **each course** according to the following student categories:

• EUP students under 25 yrs. Old	Free
• University of the Aegean other students	Free
• EUP students over 25 yrs. old	30000 GRD
• Greek citizens	50000 GRD
• International students	300 EURO

The fees should be paid before the beginning of the classes and are not refundable afterwards. **Travel and living expenses are not included.**

Identification Card

After registration, students are issued an identification card (ID) that enables them to attend summer courses, access the University libraries and participate in other University-related activities.

Health Insurance

Students willing to attend Summer School are obliged to have health insurance coverage from their place of origin.

Course Certificates

Certificates are granted to students who have fully attended and completed the coursework. Final examinations are given based on classroom and lab material at the end of the instruction period for each individual course. Students passing the course examinations are granted with Course(s) Certificates from the University of the Aegean, Department of Environmental Studies.

University Degree

Summer school courses are part of the EUP Environmental Cartography curriculum, leading to the regular 4-year University degree.

Libraries

Summer School students have a rightful access to the main library of the University of Aegean, as well as the Library of the Extended University Program and the Public Library of Mytilene.

Laboratories

Participation to laboratory work is included at the instruction time for each course.

Field Trips

The instructors, in collaboration with the University, organize field trips during the course schedule in various places of the island.

University of the Aegean

The University of the Aegean headquarters are centrally located in Mytilene. University Departments operate as well in Chios, Samos and Rhodes islands. The city of Mytilene hosts the Departments of Environmental Studies, Geography, Social Anthropology, and the Extended University Program of Environmental Cartography.

The island of Lesvos

Lesvos is an island of the Northeastern Aegean Sea, where literature and fine arts have flourished for centuries. The island is the birthplace of well known poets such as Sappho, Arion, Alkaios, Terpander, Odysseas Elytis, philosophers such as Pittakos, writers such as Argyris Eftaliotis, and folk-art painters such as Theophilos. Having a warm and mild climate, Lesvos is a scenic and majestic place for tourism and recreation around the year.

The city of Mytilene is the capital and main entry port of the island; the town has grown into the surrounding seaside hills. History has marked its traces through the city at monuments such as the Ancient Theater, the Fortress, and temples of the Byzantine and Muslim periods. The visitor can admire art collections from different periods at the Archeological Museum, the Byzantine Museum, and the Folk-Art Museum. More wonderful works of Greek artists such as Theophilos and Tsarouchis along with works of international artists such as Picasso, Chagall, Matisse are exposed at the Teriade Museum and the Library of the art critic Stratis Eleftheriadis (Teriade).

In the outskirts of Mytilene and within daily excursions, points-of-interest include the Roman Aqueduct of Moria, the Fortresses of Methymna, and Sigri where the world renown Petrified Forest is located. The Monasteries of Saint Raphael, Taxiarchis of Mantamados, Limonos of Kalloni, and the Church of the Holy Virgin of Agiassos are religious and historical centers that attract thousands of people throughout the year.

Accommodations

Students will find room and board in a series of hotels/hostels and restaurants located mainly within the city and the metropolitan area; special listing and pricing will be announced after the end of the enrollment period.

Cultural Events

During the summer season, various cultural attractions take place in the city of Mytilene and around the island (such as concerts, theatrical plays, lectures, festivals etc.) organized by public and private institutions.

Transportation and Banking

Lesvos can easily be accessed by airplane on a daily basis from Athens, Thessaloniki and Limnos. There are also connections with international airports by direct charter flights. Connections by boat are in effect all summer long with the harbors of Pireaus, Thessaloniki, Volos, Chios, Limnos, Kavala, Alexandroupolis, Samos, Patmos, Rhodes and Syros. Public transportation buses cover all main destinations within the island.

To facilitate financial exchanges in Mytilene, there are branches of the following Greek banks: National Bank, Ionian Bank, Commercial Bank, General Bank, Agricultural Bank, Alpha Credit Bank, ErgoBank, and Post Savings Bank. Automatic Teller Machines (ATMs) are available and major credit cards are accepted.

Participating Academic & Research Institutes

(in alphabetical order)

AUSTRALIA

Curtin University of Technology
- Tsakiri Maria, Lecturer, School of Spatial Sciences

University of Melbourne
- Fraser Clive, Associate Professor, Department of Geomatics

CANADA

McMasters University
- Kanaroglou Pavlos, Professor, Department of Geography and Geology

FRANCE

Centre d'Etudes de Saclay
- Paronis Dimitrios, Laboratoire des Sciences du Climat et de l'Environnement

Museum National d'Histoire Naturelle
- Couvet Denis, Professeur en Biologie de la Conservation, CRBPO

Université d'Aix-Marseille III
- Maniere Roger, Professeur d'Ecologie, Ambassade de France à Athènes

Université de Bretagne Occidentale
- Bioret Frédéric, Professeur Assistant de Biologie, Faculté des Lettres et Sciences Sociales Victor Segalen
- Brigand Louis, Professeur Assistant de Géographie, Faculté des Lettres et Sciences Sociales Victor Segalen

Université de Corse
- Biggi Michel., Dr. Institut du développement des Iles Méditerranéennes
- Meistersheim Anne, Directeur de l'IDIM. Professeur, Institut du développement des Iles Méditerranéennes

Université Pierre et Marie Curie, Paris VI
- Barbault Robert, Deputy Directeur, Centre National de la Recherche Scientifique Institut Federatif d'Ecologie Fondamentale et Appliquée, CNRS-FR3
- Loreau Michel, Professeur Institut Federatif d'Écologie
- Sarrazin François, Professeur Assistant, Laboratoire d'Ecologie

GREAT BRITAIN

Imperial College of Science, Technology and Medicine
- Lawton John, Professor CBE FRS Director, NERC Centre for Population Biology

University of Oxford
- Jansen Vincent, Professor, Department of Zoology

GREECE

Aristotle University of Thessaloniki
- Karteris Michael, Professor, Laboratory of Forest Management and Remote Sensing, Department of Forestry and Natural Environment
- Papadopoulou Maria, Assistant Professor, Department of Cadastre, Photogrammetry and Cartography, School of Rural and Surveying Engineering
- Patias Petros, Associate Professor, Department of Cadastre, Photogrammetry and Cartography, School of Rural and Surveying Engineering
- Tsakiri-Strati Maria, Assistant Professor, Department of Cadastre, Photogrammetry and Cartography, School of Rural and Surveying Engineering

Army Geographic Agency
- Halaris George, Rural and Surveying Engineer, Department of Digital Data Processing and Digital Cartography

FOTOPO Ltd.
- Stamboulоglou E., Dr., Rural and Surveying Engineer

Institute of Geology and Mineral Exploration
- Stefouli Marianthi, Dr., Geologist, Laboratory of Remote Sensing

National Agricultural Research Foundation
- Toulios Leonidas, Dr., Research Scientist, Institute of Soils Cartography and Classification

National and Kapodistrian University of Athens
- Kallos George, Assistant Professor, Department of Physics, Department of Applied Physics, Laboratory of Meteorology

National Observatory of Athens
- Sifakis Nikolaos Dr., Research Scientist

National Technical University of Athens
- Avgerinou Kolonia-Sofia, Assistant Professor, Department of Architecture Engineering
- Karathanassi Vassilia, Dr., Department of Rural and Surveying Engineering

Natural History Museum of the Lesvos Petrified Forest
- Zouros Nikolaos, Dr., Geologist, Director

Panteion University
- Anthopoulou Theano, Dr., Department of Political and Social Anthropology

University of the Aegean
- Aggelidis Mihalis, Associate Professor, Department of Environmental Studies
- Akriotis Triantafyllos, Assistant Professor, Department of Environmental Studies
- Aloupi Maria, Chemist, Department of Environmental Studies
- Delladetsimas Pavlos, Assistant Professor, Department of Geography
- Giourga Christina, Assistant Professor, Department of Environmental Studies
- Halvadakis Kostas, Associate Professor, Department of Environmental Studies
- Hatzopoulos Ioannis, Professor, Department of Environmental Studies
- Kalabokidis Kostas, Dr., Environmental Cartography
- Kokkosis Haris, Professor, Department of Environmental Studies
- Marmaras Emmanuel, Associate Professor, Department of Geography
- Matsinos Ioannis, Assistant Professor, Department of Environmental Studies
- Meliadou Alexandra, Dr., Instructor, Department of Environmental Studies
- Soulakellis Nikolaos, Lecturer, Department of Geography
- Spilanis Ioannis, Assistant Professor, Department of Environmental Studies
- Terkenli Theano, Assistant Professor, Department of Geography
- Troumbis Andreas, Professor, Department of Environmental Studies

University of Ioannina
- Katsoulis Vassilios, Professor and Director, Laboratory of Meteorology

NETHERLANDS

Wageningen Agricultural University
- Jongman Robert, Dr., Department of Environmental Sciences, Land Use Planning Group

PORTUGAL

University of Coimbra
- Freitas Helena, Associate Professor, Departamentos de Botanica

SWITZERLAND

University of Zurich
- Schmidt Bernhard, Professor, Institüt für Umweltwissenschaften

UNITED STATES OF AMERICA

California State University
- Munjy Riad A. Halim, Professor, Department of Civil and Geomatics Engineering

University of Maine
- Aggouri Peggy, Assistant Professor, Department of Spatial Information Science and Engineering
- Stefanidis Antonios, Research Assistant Professor, National Center of Geographic Information and Engineering

UNIVERSITY OF THE AEGEAN
ENVIRONMENTAL CARTOGRAPHY
EXTENDED UNIVERSITY PROGRAM

SUMMER SCHOOL 1999

REGISTRATION FORM

LAST NAME:_____

FIRST NAME: _____

TITLE:_____

ORGANIZATION:_____

ADDRESS:_____ **CITY:** _____

COUNTRY: _____ **POSTAL (ZIP) CODE:**_____

TELEPHONE:_____ **FAX:**_____

E-MAIL: _____

COURSE: _____

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COMMENTS: _____

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DATE **SIGNATURE**

Please attach a brief curriculum vitae (including education, occupation, experience) and the academic credentials requested for the enrollment in each course/module selected.
*The registration deadline is **April 30, 1999**.*

CURRICULUM VITAE

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UNIVERSITY OF THE AEGEAN
ENVIRONMENTAL CARTOGRAPHY
EXTENDED UNIVERSITY PROGRAM

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www.aegean.gr/environmental-cartography