

RESEARCH AND DEVELOPMENT



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Research Committee of the University of Thessaly
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Research projects

Sthenos: Human-centred systems for assistive environments

ASESCoBIS: isolating collagen from sponges and snails for use in cosmetics

Postgraduate Study Programme

Sustainable management of fisheries

Training the school managers of tomorrow

Ensuring high operational readiness in the military

Providing specialisation to health care graduates

M.Sc. Course in Urban and Regional Planning

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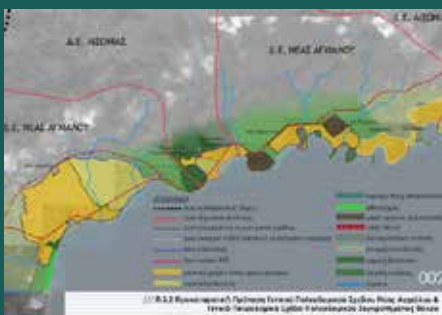
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M.Sc. in Urban and Regional Planning



Research Committee
University of Thessaly

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Introductory note

In the last few years Greece has been experienced a deteriorating financial environment. Greeks are faced with current and long-term financial problems. Yet, the difficult financial environment has been a challenge for Greeks to seek solutions to exit the financial crisis.

The University, a place for knowledge and research, should lead the effort to find solutions through research. Today more than ever before, researchers should increase their efforts to secure financial support from the European Union and to engage in research in areas that are of commercial interest.

Creating products of commercial interest: let it be our research goal.

Human-centred systems for assistive environments

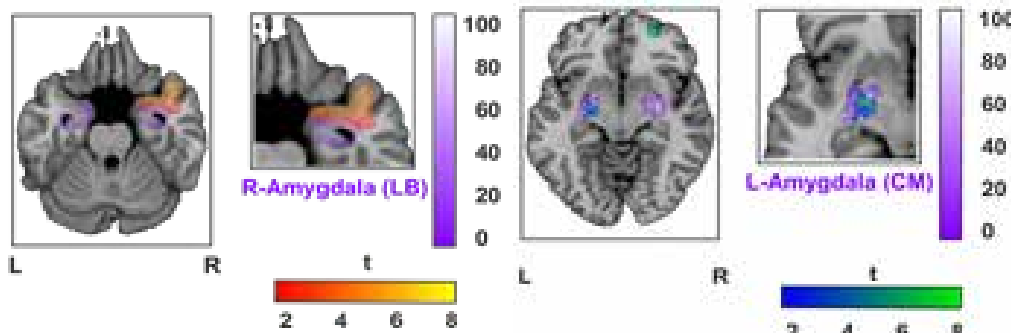
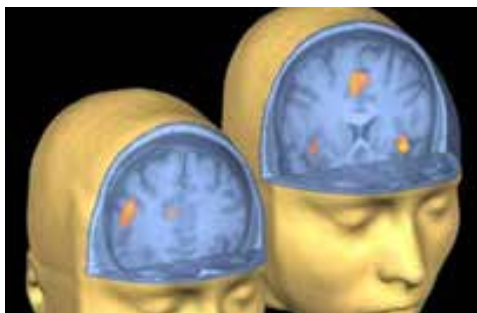
Sthenos project aims to develop non-invasive systems for the support of aged/disabled/chronic patients

The aging of the global population has obviated the need for systems to monitor people requiring assistance in their personal or hospital environment. The isolated processing of data coming from visual or other sensors has reached its limits; however, the incorporation of multimodal information may lead to enhanced functions and more robust recognition of emotional behaviour. So far, affective computing approaches have not taken into consideration cognitive models for the design of experimental protocols. Moreover, the potential of neurophysiology to model human brain responses to emotional stimuli has not been sufficiently investigated.

The Affective Computing for Biological Activity Recognition in Assistive Environments (Sthenos) project aims to develop methodologies and tools to compose pervasive human-centred systems, which will be able to understand the human state (identity, emotions and behaviour) in assistive environments using audiovisual and biological signals. The methodologies that it aims to develop will be able to offer services such as support for aged/disabled/chronic patients, the detection of critical situations from audiovisual content, biosignal and neurophysiology analysis for the detection of pathologies (such as Alzheimer’s disease), as well as for treatment follow-up.

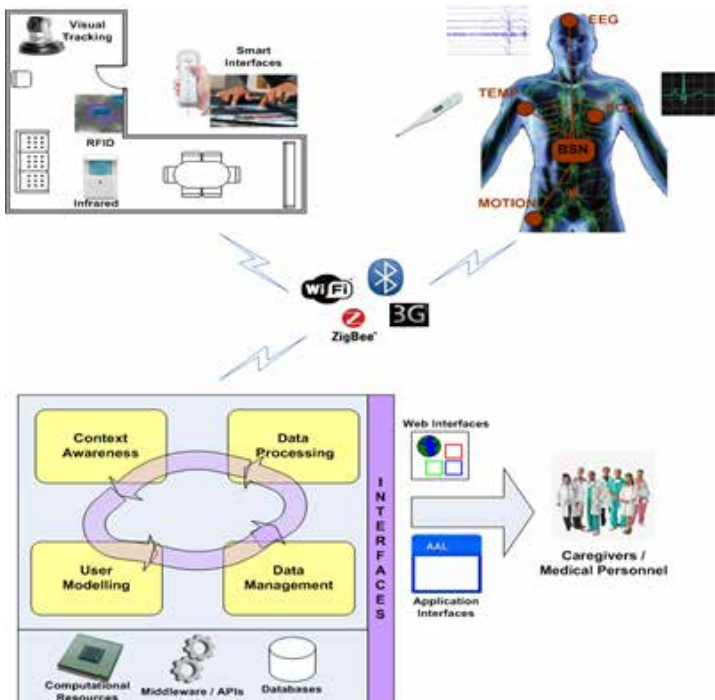
The project’s main research goals are to develop:

- Tools to recognize human behaviour from audiovisual content using the fusion of non-invasive sensors such as visual or audio. This type of behaviour includes motion patterns and trajectories and abnormal events such as falls
- Tools to identify affect and emotion from audiovisual data in a non-invasive way
- Tools to analyse neurophysiological data (EEG, ECG, SCR) in order to recognise emotional states and to perform follow-up studies
- Tools for dynamic multimodal human-machine interaction. In addition, visual attention mechanisms will be investigated and correlated to social behaviour
- An educational portal for researchers and professionals, where educational material and the created datasets will be freely accessible



Electrophysiological recording of emotions

Project director
Assistant Professor
Sandalidis Charilaos



Telemonitoring system

biological signals so as to enable an interaction mainly based on synthetic audiovisual information. The “human-centred computers” may be conventional computers, or even mobile devices (phones, tablets), which are intelligent, mobile, ubiquitous and pervasive (pervasive and ubiquitous) systems.

The Sthenos system will advance the state of the art by performing human activity and behaviour recognition in settings like an individual’s home without any restrictive assumptions about occlusions or illumination changes. The visual and audio content of the scene will be combined for optimal recognition and modelling results. Novel fusion techniques will be developed to enhance our current methods, such as our previous work concerning HMM-based fusion or tracking. Fusion before classification, classification per sensor and voting and state-level fusion will be investigated for emergency event (for example, a fall) detection. We will deploy results referring to combinations among speech, head, face, body tracking and motion data with techniques that are trained and tested on natural data recorded in real world scenarios. Sthenos associates contextual information with the observed affective behaviour, correlating observed emotional episodes to contextual events, effectively modelling the goals and intentions of the player. Sthenos will implement mechanisms to move back and forth between connectionist and knowledge-based representations, effectively benefiting from both worlds.

Another welcome feature of introducing knowledge technologies in the affect-sensing or behaviour recognition part is that the modelling domain relationships and extracted knowledge results emerge in an interoperable form, which can easily be reused. In our case, this can assist in moving from low-level, detectable features, such as the position and deformation of facial features and hand segments, to emotion-related concepts, such as the expressivity features, respecting theoretical knowledge in the process. This will be valuable in order to use also contextual information, besides developing non-verbal cues: the same facial expression from the part of the user may be related to a another goal or desire when different situations happen in his or environment – a smile as a response to different situations may correspond to joy or irony. User context information will be defined based on what the system already knows regarding the particular user, mostly related to goals and desires in the game environment, while the environment context corresponds to specific events in the game, either planned in the narrative or resulting from the actions of other players.

For more information, please visit: www.sthenos.gr/en

The non-invasive services of the proposed system are expected to prove more attractive to users but may be less accurate. The feasibility and reliability of novel services provided by non-invasive methods, such as audiovisual content processing, will be evaluated, as opposed to invasive ones, such as neurophysiological types.

The main objective of the project is the development of a methodology and an affective computing system for the recognition of physiological states and biological activities in assistive environments. The proposed research aims to develop human-centred computers that can understand the user’s state (identity, emotions and movements) using audiovisual and

Making the most of sponges and snails

Asescobis project aims to isolate collagen from sponges and snails for use in cosmetics



www.asescobis.gr

*Dr Jane Castritsi Catharios
Lead scientist on the project*

A significant natural resource, sponges are a part of the myth, history and culture of Greece and are directly connected to the county's traditions. Kalymnos island and Trikeri are the only areas in Greece where sponge fishery has survived.

In addition, snail farming represents an innovative agricultural sector with significant growth prospects in Greece.

The main objective of the Aegean Sea Sponges and Edible Snails as Alternative Sources of Collagen and Bioactive Substances (Asescobis) project is the production of collagen from commercial marine sponges (fished, farmed, or sponge residues generated during the trimming procedure) as well as from organically fed snails. Its intermediate objectives are the establishment of a pilot sponge mariculture and the enrichment of the fishing grounds as well as the establishment of a pilot plant to produce organically fed snails. The final objective is the isolation of collagen from the sponges and snails. This collagen, produced at a laboratory level, will be incorporated in cosmetic products such as creams and cream soaps.

The budget of the project was €733,260 and was co-financed by the European Regional Development Fund and Greece within the framework of the National Strategic Reference Framework (ESPA) for 2007–2013. With different ratios, private participation covered the difference between the total budget and public funds.

Some 35 individuals, most of them natural scientists and specialised technicians, were involved in the implementation of the project, which ended on 30 June 2015.

Most of the research was conducted at the University of Thessaly, which also coordinated the project. The other participants, from both the public and private sectors, were:

- Department of Food Quality & Chemistry of Natural Products of the Mediterranean Agronomic Institute of Chania
- National and Kapodistrian University of Athens
- Selonda Aquaculture SA
- Dalcochem SA

The scientific findings of the Asescobis project led to the conclusion that the team is capable of producing collagen from endemic Mediterranean species, thus assuring the quality of the product and exploiting the natural resources of the country.

Upon completion, the project will contribute to the achievement of the objectives, scope and priorities of the ESPA. In this regard, it supports the cooperation between the research bodies and enterprises for the implementation of common research and technological projects which support green development, the competitiveness of both Greek enterprises and higher educational institutions, thus improving the quality of life of Greek citizens.



For more information, please visit

www.asescobis.gr

Sustainable management of fisheries

MSc programme in Sustainable Management of Aquatic Environment trains graduates in environmental management, fisheries and aquaculture

The master of science programme in the Sustainable Management of Aquatic Environment was devised to meet a number of challenges and opportunities: coupled with the realisation that the deterioration of the aquatic environment was threatening biodiversity and livelihoods and that capture fisheries production internationally, although it has been relatively stable in the past decade, has given rise to concerns about the state of marine stocks, was the fact that the aquaculture sector has expanded enormously to account for almost half of total food fish supply.

In 2004, the Department of Ichthyology and Aquatic Environment of the University of Thessaly began offering the MSc course, in cooperation (in terms of academic personnel and facilities) with the Department

of Fisheries and Aquaculture and Management of the Technological Education Institute (TEI) of Messolonghi and the Department of Forestry and Natural Environment the Department of Biosystems Engineering, both of TEI Larissa.

The course is devised to cover the increased educational, professional and research requirements in aquatic environmental management, fisheries and aquaculture.

The department also of-





fers postgraduate studies to PhD level.

This programme in Sustainable Management of Aquatic Environment aims to give students:

- an understanding of the scientific principles that underpin the sustainable management of the aquatic environment in the fields of aquaculture, fisheries, protection and conservation of the aquatic ecosystem as well as

the processing and trade of fish and fishery products

- a sound training in relevant practical, investigative, research and generic skills
- the necessary knowledge and skills for a successful career in the private, public and academic sectors
- Provision of background knowledge for eventual continuation at PhD level

The MSc curriculum courses are organised in the following thematic categories:

- fisheries
- aquaculture
- biodiversity
- aquatic animal nutrition, aquafeed technology
- fish physiology
- parasitic and infectious fish diseases
- genetics and molecular biology of aquatic fauna and flora
- processing technology, hygiene and preservation of fish and seafood
- marketing of aquatic products
- economic evaluation of aquatic natural resources
- sustainable management of aquatic resources
- hydrology, limnology, plankton and benthic ecology
- oceanography

More information on the course is available at www.pms.apae.uth.gr or by contacting:

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Training the school managers of tomorrow

Graduate programme prepares teachers to assume the administration and management of Greek schools

The graduate programme Organisation and Administration of Education prepares teachers to meet the intellectual and practical challenges involved in the administration and management of Greek schools.

The objective of the course, which is offered by the Department of Primary Education of the University of Thessaly, is to train teachers to assume management positions in the Greek educational system in a wide array of formal and informal educational settings.

Graduates will be prepared to provide leadership in schools as educators, administrators and facilitators of educational change.

The programme also seeks to cultivate in participants the knowledge and the desire to create positive learning experiences for all stakeholders within the school context – teachers, students and parents – by monitoring changes in society, addressing multiculturalism as an opportunity and transforming the school to an organisation that learns.

For more information, please visit: www.pre.uth.gr/new/en



Ensuring high operational readiness in the military

TITLE: Ensuring high operational readiness in the military

SUBTITLE: *MSc programme in Military Fitness Wellbeing provides military leaders with the skills and knowledge to promote physical and mental fitness*

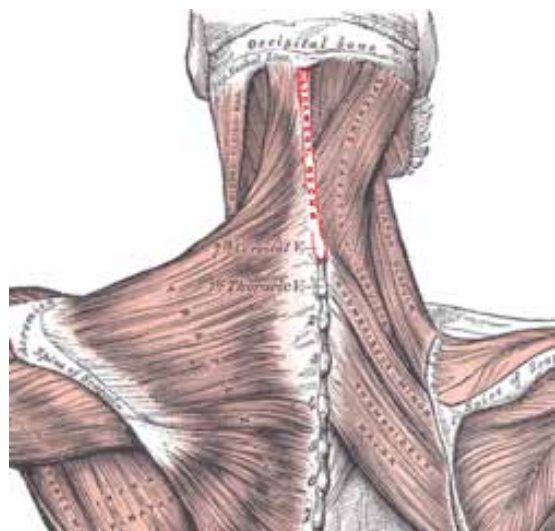
Given the demanding global operational environment, which is marked by asymmetric threats, crisis management, interaction with international allies, etc., the MSc programme in Military Fitness Wellbeing recognises adequate physical and mental fitness as critical elements for a military leader to maintain a high operational readiness.

The goals of the programme are:

- To produce proficient graduates-leaders in uniform with appropriate skills and knowledge in physical and mental fitness
- To develop military personnel who are well-informed about aspects of physical fitness in order to prevent injury and to promote health and operational readiness
- To cultivate critical thinking and an analytical approach to the examination of existing literature and promote research related to the physical fitness of the armed forces
- To apply advanced techniques in the analysis and design of complex programmes that aim to improve the physical efficiency and operational capacity of the armed forces
- To promote research in the area of military science and contribute towards the production of new knowledge in the broader field
- To promote cooperation with relevant national and international research centres and universities, companies and social institutions, and to collaborate with related professional and interprofessional teams
- To increase the mobility of international students and academic staff

Tuition fees for the 18-month programme, which is conducted in English and Greek, are €3,900.

For more information, please contact +30 24310 47019, email msc@pe.uth.gr or visit postgrad.pe.uth.gr/militaryfitness/



Providing specialisation to health care graduates



Postgraduate programme in Primary Health Care aims to produce all-round health care experts

The postgraduate studies programme in Primary Health Care, offered by the School of Medicine of the University of Thessaly in cooperation with the Department of Nursing of the Technological Education Institute (TEI) of Larissa, aims to provide specialisation to health science graduates of universities and TEIs in the important area of primary health care.

The many difficulties in all aspects of medical and nursing care (quality of service, management and economy) make the development of scientists with specialist knowledge in this health area necessary.

The programme draws on the extensive knowledge and experience of the faculty members of the Medical School and Department of Nursing to provide a high-class postgraduate education.

The objective of the programme is to provide students with knowledge and skills in:

- The promotion and growth of research in health care sciences
- The study of health care models, as presented in Greek and international literature
- The development of techniques and the determination of measures regarding the promotion of both physical and mental health

- The design of health care programmes for the community, workplace and family
- The management of organisations and institutions that provide health care services
- Dealing with life-threatening and dangerous situations
- The study and characterisation of both care and behaviour associated with health in certain population groups with specific cultural habits (such as repatriates, economic migrants, Greek Muslim community, Roma)

In addition, course participants are trained in techniques and methods regarding:

- The analysis and evaluation of health care behaviour and situations pertaining to rural populations, etc
- The research and identification of factors that have a negative influence on the health of the general population and favour disease development
- The analysis and evaluation of the dynamics that influence the (financial) cost of health care
- The evaluation of goods and products related to health, health services, programmes and health promotion programmes
- Health marketing and management programmes
- Qualitative and quantitative research in health sciences

The postgraduate programme in Primary Health Care, which runs for two (calendar) years, includes mandatory and elective courses and classes and traineeships. Participants are required to complete 120 ECTS (European credit transfer and accumulation system) credits.

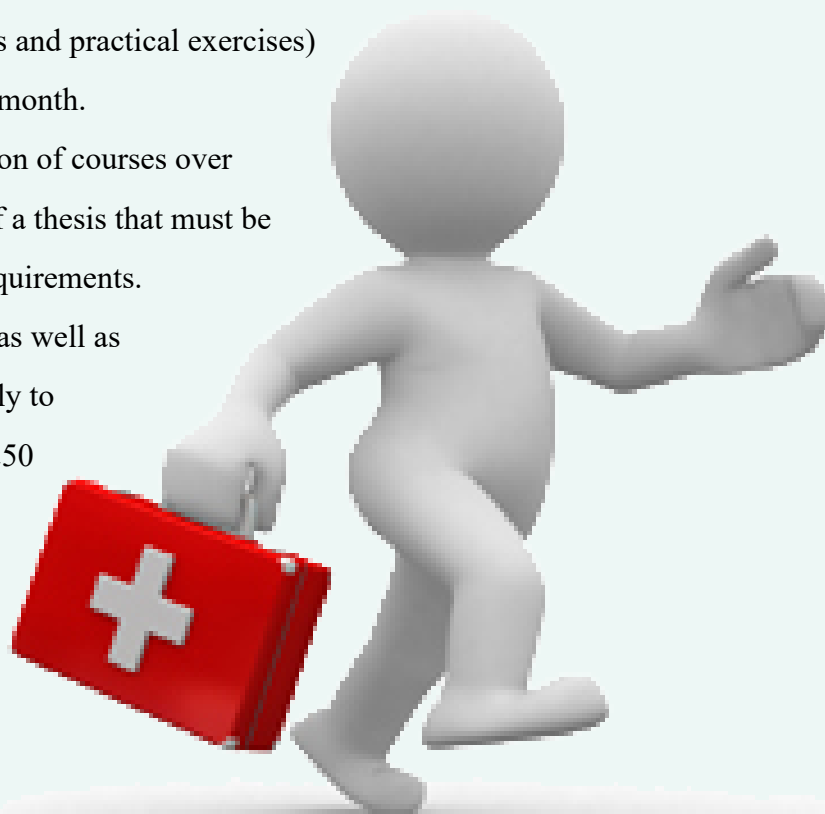
Each course lasts 26 hours (comprising lectures and practical exercises) and runs for four days (Thursday to Sunday) each month.

Mandatory attendance and successful completion of courses over the two academic years, followed by the writing of a thesis that must be completed within four months, are basic course requirements.

Graduates of university or TEI health schools, as well as equivalent institutions abroad, are welcome to apply to participate in the programme. Tuition fees are €1,250 per semester.

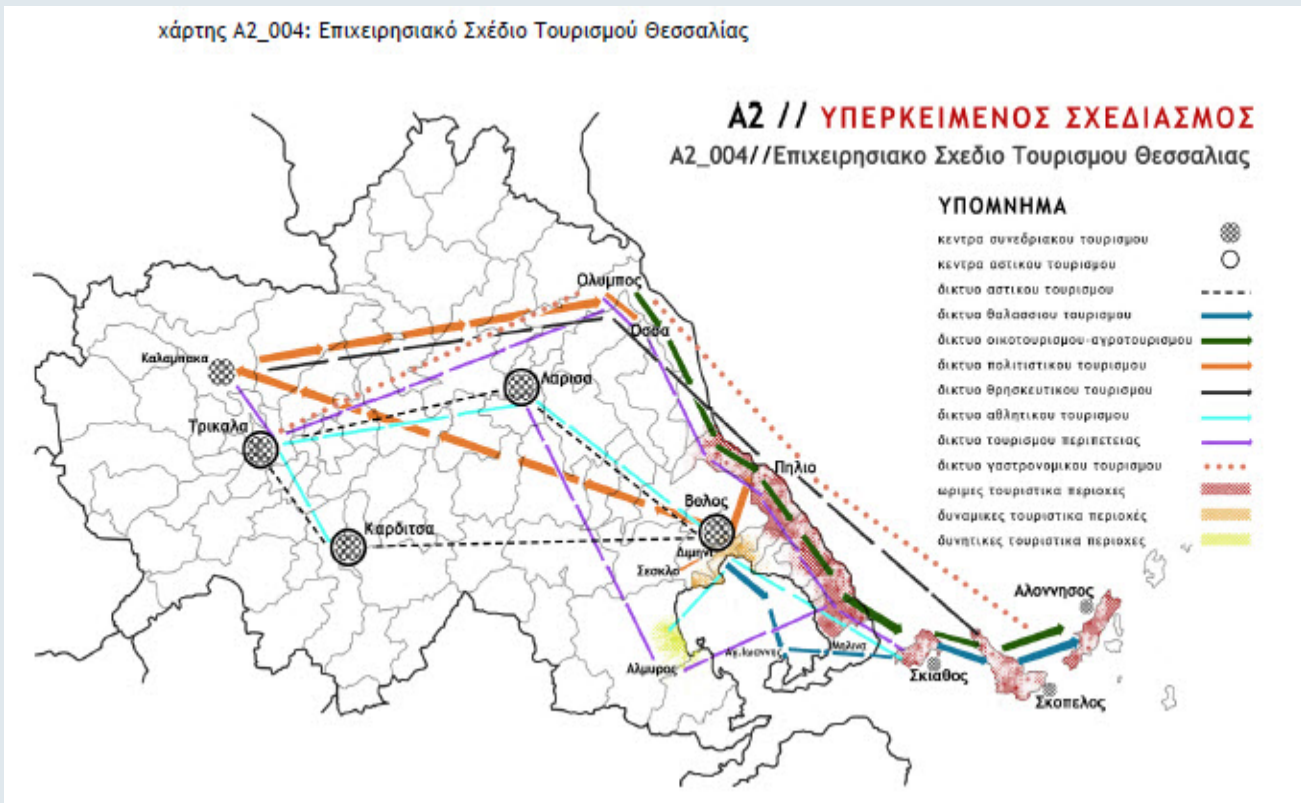
For more information, please visit

acare.med.uth.gr/en/



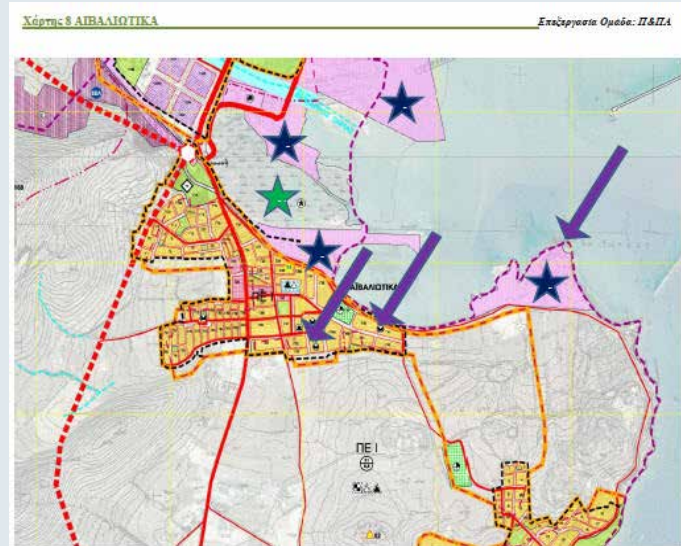
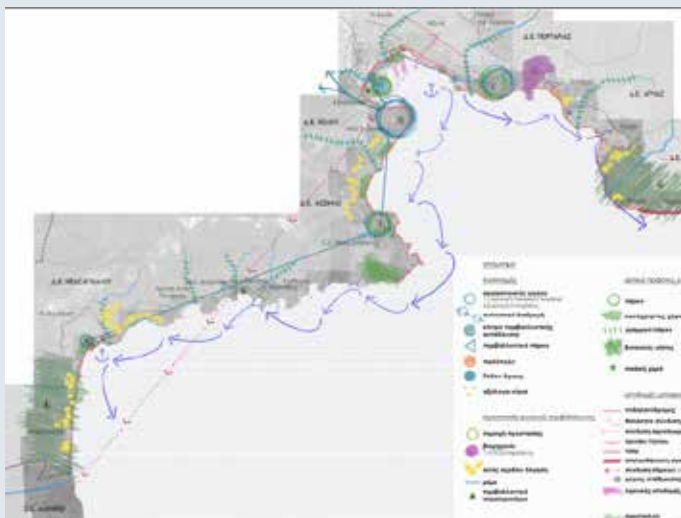
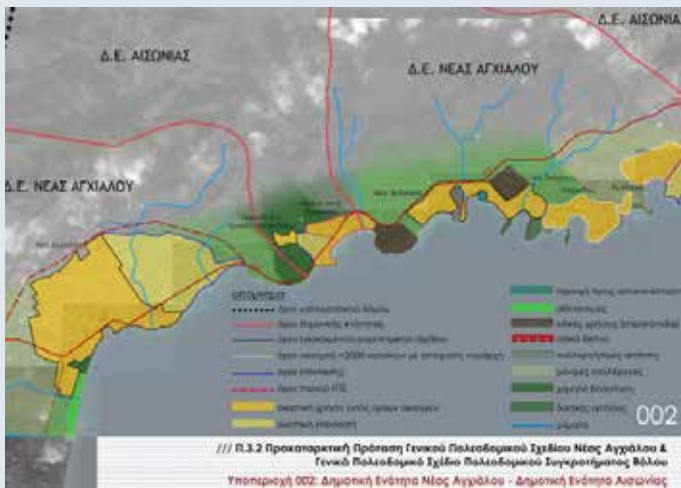
M.Sc. Course in Urban and Regional Planning

χάρτης A2_004: Επιχειρησιακό Σχέδιο Τουρισμού Θεσσαλίας



The postgraduate programme in Urban and Regional Planning of the University of Thessaly aims to combine high academic standards with the employment prospects of graduates. The main objective of the programme is to train scientists of various backgrounds to issues related to Urban and Regional Planning adopting a multi-disciplinary approach most suitable to the essence of the specific fields. The programme is in some aspects complementary to the undergraduate programme of the Department and together they provide a well-focused approach to planning from the viewpoint of spatial sciences.

The M.Sc. programme consists of two semesters of coursework and a thesis. The first semester comprises four compulsory courses covering subjects from a theoretical viewpoint. The second se-



mester includes a compulsory course and four elective courses focusing on implementation and in-depth research. During the first semester a series of Greek and international experts on the fields relevant to Urban and Regional Planning are invited to speak at a weekly afternoon seminar. Compulsory courses are taught every year, whereas elective availability depends on the number of students that select them. The list of courses offered is announced in the beginning of the year. Students have to choose at least two courses in their specialisation. Teaching and examinations are in Greek while the bibliography may either be Greek or international.

The M.Sc. students are selected based on their academic background, professional and/or scientific achievements and experience, a written test in English and, finally, a personal interview. The attendance to the programme may be full time or part time. The minimum duration for graduation is 12 months. Fees cover the operational costs of the programme, annual student scholarships and fees for the invited lecturers.

Submission of the M.Sc. thesis concludes the successful completion of the programme. M.Sc. dissertations are supervised by one or two members of staff within the Department. Dissertations should exhibit advanced theoretical knowledge, competence in practice and implementation, critical thinking and the ability to promote and advance research. The subjects may be theoretical or applied and may be developed in cooperation with private or public bodies. The presentation and support of each thesis takes place in front of a three member departmental evaluating committee.

For more information please visit:

For more information please visit:

www.prd.uth.gr/en/courses/postgrad_urban_and_regional_planning



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