MODULE OUTLINE

1. GENERAL INFORMATION

SCHOOL	SCHOOL OF APPLIED ARTS AND SUSTAINABLE DESIGN			
PROGRAM COURSE	Protection of Cultural Heritage and Monuments of Nature from the Effects of Climate Change			
LEVEL OF STUDY	POSTGRADUATE			
MODULE CODE	CCC60	**YEAR OF STUDY**	2nd	
MODULE TITLE	Telematics and metrics			
INDEPENDENT TEACHING ACTIVITIES *in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits*			**HOURS**	**CREDITS**
Weekly teaching hours 18-19* 30 weeks			560	20 ECTS
COURSE TYPE Compulsory, Optional, Optional mandatory	Compulsory			
PREREQUISITE MODULES:	NONE			
LANGUAGE OF INSTRUCTION AND EXAMS	English			
THE MODULE IS OFFERED TO ERASMUS STUDENTS	No (due to annual duration of the module)			
MODULE WEBSITE (URL)	https://www.eap.gr/en/protection-of-cultural-heritage-and-monuments-of-nature-from-the-effects-of-climate-change/topics/#ccc60 Each module has its own space in the Learning Management System of EAP (https://study.eap.gr/login/index.php), with controlled access (use of code) for students and teaching staff.			

2. LEARNING OUTCOMES

Learning Outcomes

- *The course learning outcomes, specific knowledge, skills and competences of an appropriate (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:*

Upon successful completion of the course, students will:

- Get acquainted with the basic techniques, methodologies, and metrics of telematics utilized to monitor earth ecosystems, focusing on cultural heritage elements.
- Understand the basic principles of remote sensing, including satellite and in-situ

platforms, and how they are applied at different scales (i.e., monuments, world heritage cities, sites of natural heritage) in relation to climate change.
- Familiarize with GIS mapping and its applications on cultural heritage to assess impacts from climate change and other relevant environmental stressors.
- Recognize the significance of and benefits from Earth observations to support climate change adaptation and mitigation actions, emphasizing on cultural heritage protection international initiatives.
- Learn about and be able to use brand new innovative Earth observation approaches, including tools and services, to assess and evaluate climate change impacts on cultural heritage.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies,
Adapting to new situations
Decision-making
Individual/Independent work
Group/Team work
Working in an international environment
Working in an interdisciplinary environment
Introduction of innovative research
Project planning and management
Respect for diversity and multiculturalism
Environmental awareness
Social, professional and ethical responsibility and sensitivity to gender issues
Critical thinking
Development of free, creative and inductive thinking
……
(Other…….citizenship, spiritual freedom, social awareness, altruism etc.) …….

Search for, analysis and synthesis of data and information by the use of appropriate technologies,
Adapting to new situations
Decision-making
Individual/Independent work
Project planning and management
Critical thinking
Development of free, creative and inductive thinking

3. Module CONTENT

This Course Module (TU) deals with topics in the science of telematics offering a comprehensive picture of the wide range of Earth observation applications and relevant metrics to address climate change and other environmental impacts on cultural and natural heritage.

There the following units:

Unit 1. Ground-based metrics and telematics.

Unit 2. Passive and active remote sensing technologies.

Unit 3. Satellite-based metrics and telematics.

Unit 4. GIS mapping.

The first Unit aims to introduce you to methods of surveying natural and man-made spatial objects. It also aims to understand the use of surveying instruments, the measurement of lengths, angles, slopes, and polygonal lines, as well as the methods of horizontal surveying and levelling, tachaeometry, the three-dimensional coordination and finally the drawing methods for topographic diagramms.

The second Unit aims to introduce you to remote sensing technologies and their multiple applications. You will be introduced to the basic terms and concepts needed in order to be able to understand the context and the specialised implementation aspects of remote sensing on cultural heritage. The overall aim is to provide an introduction to the theoretical background as well as to practical issues and then focus on selected good practices that underpin the modern and partially still untapped potential of remote sensing in tackling cultural heritage protection.

The third Unit aims to introduce you to the satellite-based metrics and to multiple applications under the general scope of Earth observations. In particular, you will be introduced to data and products derived from the Copernicus program, giving special attention to climate and cultural-related services in order to be able to understand the contribution of remote sensing in protecting cultural heritage from climate change impacts. The overall aim is to provide an introduction to multiple research and application perspectives of the aforementioned services.

The fourth Unit aims to introduce you the basic concepts, theoretical and practical, related to the subject of Geographic Information Systems (GIS). The main goal is to present the fundamental GIS principles and the necessary techniques in order to mapping and create data and then, analyzing, managing and visualizing. Furthermore, the unit will close with multidisciplinary GIS applications and the role of GIS in environmental study, protection and management focusing on the natural environment.

4. TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	Distance education with five Group Tutorial Meetings (OSS) during the academic year on weekends.
USE OF INFORMATION AND	We use :

<table>
<tr><td>COMMUNICATION TECHNOLOGY
Use of ICT in teaching, Laboratory Education, Communication with students</td><td>Remote meetings tools (cisco webex),
Presentation software (e.g. power point),

Additionally, the students use office automation tools, web browsers and e-reader for digital books.</td></tr>
<tr><td>MODULE DESIGN
Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc

The study hours for each learning activity as well as the hours of selfdirected study are given following the principles of the ECTS.</td><td>
<table>
<tr><th>Activity</th><th>Annual Workload</th></tr>
<tr><td>5 Group tutorial meetings x 4 hours</td><td>20</td></tr>
<tr><td>5 Horizontal tutorial OSS (* 2 hours)</td><td>10</td></tr>
<tr><td>Activities and Multiple Choice Exercises (32 x0.5 hours)</td><td>16</td></tr>
<tr><td>Preparation of 4 assignments (4 x 20 hours)</td><td>60</td></tr>
<tr><td>Examination</td><td>3</td></tr>
<tr><td>Individual study</td><td>451</td></tr>
<tr><td>Total module workload (hours)</td><td>560</td></tr>
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</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS
Detailed description of the evaluation procedures.

Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work, other……etc.

Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students</td><td>The written assignments make up to 30% of the final grade. Students have to take the final exams at the end of the academic year. To take part in the exams you need to have acquired a sum of 20 in at least three (3) out of four (4) assignments.

There are all the criteria posted, both in each written assignment (in the study) and in the general regulation:
https://www.eap.gr/wp-content/uploads/2022/03/kanonismos-spoudwn-isxys-apo-to-didaktiko-etos-2022-2023.pdf</td></tr>
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(6) SUGGESTED BIBLIOGRAPHY

- *Suggested bibliography:*

Book 1. Remote sensing and global environmental change (2011)
Book 2. Satellite technology: principles and applications (2014)
Book 3. Urban remote sensing: monitoring, synthesis and modeling in the urban environment (2011)
Book 4. Scale issues in remote sensing (2014)
Book 5. Remote Sensing Imagery (2014)
Book 6. Satellite communications systems engineering: atmospheric effects, satellite link design and system performance (2017)
Book 7. Wireless Sensor Systems for Extreme Environments: Space, Underwater, Underground, and Industrial (2017)
Book 8. Earth observation for land and emergency monitoring (2017)
Book 9. Satellite communications systems: systems, techniques and technology (2020)