

COURSE OUTLINE

1. GENERAL

SCHOOL	SCHOOL OF ENVIRONMENT, GEOGRAPHY AND APPLIED ECONOMICS		
DEPARTMENT	GEOGRAPHY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	GE2500	SEMESTER	7
COURSE TITLE	SPECIAL TOPICS IN REMOTE SENSING		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS CREDITS
LECTURES & LABORATORY EXERCISES		3	5
COURSE TYPE	Elective		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATION:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes, in English		
COURSE WEBPAGE (URL)			

2. LEARNING OUTCOMES

Learning Outcomes
The aim of the course is to deepen students' understanding of modern and advanced methods for analysing remote sensing data, with emphasis on practical applications for monitoring and mapping the human and natural environment. Upon successful completion of the course, students will be able to: • recognise and interpret the spectral signatures of different objects, materials and surfaces of the Earth's surface, • select appropriate remote sensing data and preprocessing procedures according to the problem and application, • apply land use/land cover mapping methodologies using Machine Learning algorithms, • implement basic change detection techniques using Earth Observation data and GeoAI approaches, • design an integrated remote sensing study for applications in geography, the environment and natural resource management.
General Competences
Through lectures, laboratory exercises and the completion of an applied assignment, students develop the following general competences: • Search, analysis, synthesis and evaluation of remote sensing data and geospatial information. • Use of Information and Communication Technologies and specialised remote sensing/GIS software. • Ability to work independently and collaborate in laboratory and applied activities. • Critical thinking, decision-making and evidence-based selection of analytical methodologies. • Design and management of an integrated study based on remote sensing data. • Production, interpretation and communication of thematic maps and results to scientific and applied audiences.

3. COURSE CONTENT

The aim of the course is to deepen students' understanding of modern and advanced methods for analysing remote sensing data, with emphasis on practical applications for monitoring and mapping the anthropogenic and natural environment. Within the course, students will become familiar with the spectral signatures of different objects and surfaces, the use of spectral libraries and the basic methods for assessing spectral separability. This knowledge will contribute to understanding fundamental principles of remote sensing for identifying, discriminating and mapping natural and human-made features of the Earth's surface. In parallel, students will be taught methodologies for land use and land cover mapping using Machine Learning algorithms, as well as change detection techniques from Earth Observation data using GeoAI, with emphasis on natural disasters and other environmental changes. The course also includes an introduction to thermal remote sensing and its basic applications, as well as topics related to the collection and exploitation of data from UAVs/RPAS. Through theoretical teaching and practical applications, students will acquire knowledge of the main stages of collecting, processing, analysing and interpreting remote sensing data, with the aim of applying them to contemporary problems in geography, the environment and natural resource management.

4. TEACHING AND LEARNING METHODS - ASSESSMENT

DELIVERY MODE	In person - In the classroom - In the laboratory														
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of electronic media in lectures and specialised commercial and open-source software for the processing remote sensing and geospatial data. Indicatively: GIS/Remote Sensing software, data analysis environments and open satellite data platforms.														
TEACHING ORGANISATION	<table><tr><th><i>Activity</i></th><th><i>Semester Workload</i></th></tr><tr><td>Lectures</td><td>33</td></tr><tr><td>Laboratory sessions</td><td>8</td></tr><tr><td>Exercises</td><td>8</td></tr><tr><td>Assignment</td><td>20</td></tr><tr><td>Independent study</td><td>60</td></tr><tr><td>Course Total</td><td>129</td></tr></table>	<i>Activity</i>	<i>Semester Workload</i>	Lectures	33	Laboratory sessions	8	Exercises	8	Assignment	20	Independent study	60	Course Total	129
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Course Total	129														
STUDENT ASSESSMENT	Language of assessment: Greek Assessment methods: The assessment criteria and weighting of each assessment are announced at the beginning of the semester.														

5. RECOMMENDED BIBLIOGRAPHY

- Liu, J. G., & Mason, P. J. (2024). Image Processing and GIS for Remote Sensing. Scientific editors of the Greek edition: George P. Petropoulos & Michael Foumelis. Disigma Publications
- Jensen, J. R. (2015). Remote Sensing of the Environment: An Earth Resource Perspective. NTUA Publications.