

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF ENVIRONMENT, GEOGRAPHY AND APPLIED ECONOMICS		
DEPARTMENT	GEOGRAPHY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	GE081	SEMESTER	4
COURSE TITLE	Introduction to Remote Sensing		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS CREDITS
Lectures & Laboratory Exercises		3	5
COURSE TYPE	Compulsory		
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 introduce students to the basic principles, concepts and methods of Remote Sensing, with emphasis on understanding the interaction of electromagnetic radiation with the Earth's surface, the characteristics of satellite data, and the main stages of digital image processing and interpretation. Upon completion of the course, students will be able to identify basic Earth observation systems, understand the spectral signatures of different surfaces, apply basic preprocessing and analysis techniques to satellite images, and evaluate remote sensing applications in geography, environmental studies and natural resource management.
General Competences
• Understanding of the basic principles of Remote Sensing and Earth Observation. • Familiarity with the electromagnetic spectrum, spectral response and spectral signatures of surfaces. • Understanding of the main characteristics of digital satellite images and their spatial, spectral, radiometric and temporal resolutions. • Application of basic pre-processing, enhancement, classification and interpretation techniques for satellite images. • Development of skills in the use of Remote Sensing and GIS software for geospatial data analysis. • Connection of remote sensing data with applications in geography, the environment, agriculture and natural resource management.

(3) COURSE CONTENT

Introduction to Remote Sensing and Earth Observation. Basic concepts and historical development of Remote Sensing. The electromagnetic spectrum and basic principles of radiation. Interaction of electromagnetic radiation with the atmosphere, vegetation, soil, water and urban surfaces. Spectral signatures and interpretation of spectral response. Characteristics of digital images: spatial, spectral, radiometric and temporal resolution. Satellite Earth observation systems and basic sensors used in optical, thermal and microwave remote sensing. Basic stages of satellite image preprocessing: radiometric, atmospheric and geometric correction. Image enhancement techniques, histogram enhancement, spatial filters and spectral enhancement. Vegetation indices and other spectral indices. Principal Component Analysis. Basic principles of image classification and accuracy assessment. Introduction to radar remote sensing and thermal remote sensing. Applications of Remote Sensing in geography, land-use and land-cover mapping, vegetation monitoring, soil studies, water resources, urban areas and environmental monitoring.

(4) TEACHING AND LEARNING METHODS - ASSESSMENT

DELIVERY MODE	In person teaching • In the classroom • In the laboratory	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Electronic media are used during lectures, as well as specialised free, open-source and commercial software.	
TEACHING ORGANISATION	Activity	Semester Workload
	Lectures	23
	Laboratory teaching	14
	Exercises	12
	Assignment	20
	Independent study	60
	Total Course Workload	129
STUDENT ASSESSMENT	Language of assessment: Greek Assessment methods: The assessment method of the course is defined by the instructor at the beginning of the semester.	

(5) RECOMMENDED BIBLIOGRAPHY

- Chuvieco, E. (2025). Fundamental Principles of Satellite Remote Sensing: An Environmental Approach. Papazisis Publications. ISBN: 978-960-02-4555-4.
- 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