Course Syllabus

Title (Greek)	Title (English)	Main instructor	Co-lecturers
Τηλεπισκόπηση στην Γεωργία	Remote Sensing in Agriculture	Psomiadis E.	

Course

This course will present the fundamental principles of Remote Sensing (RS) technologies and methods in crop monitoring, management, and production. It will focus on the efficiency and accuracy of Remote Sensing data, along with other synergistic spatial tools such as the Global Positioning System (GPS) and Geographic Information Systems (GIS), for storing and analyzing spatial data and make better decisions in agriculture, land development, environmental protection, and restoration. Specifically Remote Sensing with the innovative spectral, temporal, and spatial advances of satellites and Unmanned Aerial Systems can be a powerful tool in the context of agriculture in assessment of crop area extent, management of water resources, identification of pest attacks and diseases, yield assessment studies, land suitability assessment for agriculture disaster management and precision agriculture.

Participants will apply their new skills to one of several case studies in topics on agriculture, pest management, crop monitoring, water resource management and risk assessment among others. This course will offer a mixture of lectures, demonstrations and hands-on exercises using RS and GIS software (mainly open-source).

Learning objectives

This course will be focused on scientific achievement, acquisition of knowledge and enhancement of comprehension of information regarding the Remote Sensing advances and technological achievements for crop monitoring, management, and production. MSc students will practice knowledge-based critical thinking and solution offering about Remote Sensing (Satellite and UAS) and synergistic for crop production.

The MSc degree students completing this course will be able to:

- Learn the principals of Remote Sensing
- Identify the sensors and image needed to apply Remote Sensing practices
- Learn how to acquire, store, manage and process remote sensing data.
- Use advance techniques from different sources and sensors for mapping and monitoring crops
- Understand Digital Image Processing Techniques in Agriculture Resource Management
- Understand Precision farming using RS for Crop management
- Expose participants in RS applications in water, soil and disease/pest management in agriculture
- Understand participatory method in agriculture resource management in context of RS

Week	Course Contents
1st	Fundamentals of Remote Sensing (Psomiadis)
2nd	Introduction to Earth observation and remote sensing techniques (Psomiadis)
3rd	RS data acquisition and pre-processing (Psomiadis)
4th	RS data basic processing (Psomiadis)
5th	Creation of Vegetation-Soil Indices and Biophysical parameters (Psomiadis)
6th	RS data Classification (Psomiadis)

7th	Participatory tools (GIS, GNSS, etc.) for crop monitoring and management
8th	Acquisition and Processing of UAS data
9th	Methods for cropland/crop type mapping from S2 and/or S1 time series
10th	Concepts and methods for LAI/FVC/fAPAR/Chlorophyll retrieval and crop time series for growth monitoring

Assignments –

1. RS data acquisition and processing (Vegetation Indices and Classification)

2. Technologies and applications for integrated RS monitoring and management of crops

3. RS data and participatory tools for crop management

Exams, marking and student assessment

Assignments (three): 70%, Written exams: 30%

Proposed reference material

- Scientific papers, given by the lecturers