Remote Sensing

COURSE OUTLINE

1. GENERAL

SCHOOL	Environment and Agricultural Engineering			
ACADEMIC UNIT	Department of Natural Resources Development & Agricultural Engineering			
LEVEL OF STUDIES	Master			
COURSE CODE	630023	**SEMESTER**	1st	
COURSE TITLE	Remote Sensing			
INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*			**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises			3	6
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).				
COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Specialised general knowledge			
PREREQUISITE COURSES:				
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek			
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (English)			
COURSE WEBSITE (URL)	http://www.afp.aua.gr/?page_id=71&lang=en			

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The "Remote Sensing" course is designed to present fundamental principles and innovative advances in Remote Sensing (RS) technologies and methods, specifically tailored for agriculture, geology, geomorphology, natural resources, natural disasters, etc. The course emphasises the efficiency and accuracy of RS data, coupled with spatial tools like Global Positioning System (GPS) and Geographic Information Systems (GIS), to facilitate informed decision-making in agricultural and geological applications. Students will explore the applications of RS, especially with advancements in satellite and Unmanned Aerial Systems (UAS). The course structure includes a combination of lectures, demonstrations, and hands-on exercises, utilising RS and GIS software, predominantly open-source.

This course aims to achieve scientific proficiency, knowledge acquisition, and an enhanced understanding of Remote Sensing advances and technological achievements for agricultural and geological applications. Upon completion, MSc degree students will:

- Learn the principles of Remote Sensing.
- Identify the sensors and images required for applying Remote Sensing practices.
- Acquire skills in acquiring, storing, managing, and processing remote sensing data.
- Utilise advanced techniques from different sources and sensors.
- Understand Digital Image Processing Techniques.

- Explore RS applications in agricultural and geological applications through participatory methods.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Production of new research ideas	*Others…*
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Teamwork
- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Respect for the natural environment
- Project planning and management

3. SYLLABUS

- Fundamentals of Remote Sensing (Psomiadis)
- Introduction to Earth observation and remote sensing techniques (Psomiadis)
- RS data acquisition and pre-processing (Psomiadis)
- RS data basic processing (Psomiadis)
- Creation of Indices (Psomiadis)
- RS data Classification (Psomiadis)
- Participatory tools (GIS, GNSS, etc.) for agricultural and geological applications (Psomiadis)
- Acquisition and Processing of UAS data (Psomiadis)
- Methods for mapping from S2 and/or S1 time series (Psomiadis)

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY
Face-to-face, Distance learning, etc.

Face-to-face & distance learning

- Lecture-Based Learning
- E-Learning
- Internships and Work-Study Programs
- Field Trips
- Guest Lectures
- Group Projects

USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY
Use of ICT in teaching, laboratory education, communication with students

- Basic software (windows, word, excel, PowerPoint, web, etc)
- AUA webmail
- AV material
- Powerpoint slides

TEACHING METHODS
The manner and methods of teaching are described in detail.
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.

The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS

Activity	***Semester workload***
Lectures	20
laboratory practice – field	10
Course total	***30***

STUDENT PERFORMANCE

I. Written final exam (30%) which includes:

EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	• Multiple Choice Questions • Short Answer Questions II. Three assignments & Case Studυ (70%)

5. ATTACHED BIBLIOGRAPHY

- Remote Sensing Digital Image Analysis, John A. Richards, 2013
- Remote Sensing and Image Interpretation, Lillesand, Kiefer and Chiepman, 2015