ERASMUS MUNDUS MASTER PROGRAMME IN SOIL SCIENCE – emiSS

2020-2021 ACADEMIC YEAR - MODULE SYLLABUS

Name of course:	
REMOTE SENSING AND GIS in SOIL SCIENCE	
ECTS	*6*
Type of Course	*Elective*
Form of Examination	*Written Examination*
Prerequisites	*Basic knowledge in the Remote Sensing (RS) and Geographical Information System (GIS)*

Field of Study:	
Agriculture	
Education profile	*Academic*
Code of study form and level of education	*Master of Science*
Academic year/Semester	*First year/Fall Semester*
Specialization	*Remote Sensing (RS) and Geographical Information System (GIS)*
Language of education	*English*

The lecturer module:	
The name of faculty	*Ondokuz Mayıs Univ. Faculty of Agriculture*
The name of department	*Soil Science & Plant Nutrition*

Educational outcomes:	
Description of the learning effect	
KNOWLEDGE - student knows and understands:	
1	*Student knows to gain fundamental concepts and techniques using computer GIS and RS program*
2	*Student knows the use of Remote Sensing (RS) and Geographical Information System (GIS) for environmental and agricultural purposes*
3	*Student knows interpretation of the aerial photographs and satellite images*
SKILLS - the graduate can	
1	*Student obtains the necessary scientific information from literature, databases or other sources*
2	*Student shows the ability to correctly interpret results and draw conclusions from thematic maps.*
3	*Student knows how to create soil and land database and produce thematic maps*

SOCIAL COMPETENCES - graduate:

1	*Student shows activity during a discussion on various issues related to soil and land resources*
2	*Student has the competence to participate in land resource research and discuss their results*

Course objectives and content:

This course is to acquaint the graduate students with fundamental concepts of advanced soil physics.

Relationships among solid, liquid and gas phases, total potential of soil water, water flow in planar, radial and spherical symmetries, heat transport in soil system, saturated and unsaturated flow, solutions for some flow problems.

Remote Sensing and GIS in Soil Science		*36 hours*
Subject of lecture	*1*	*Fundamental concepts and history of RS and advantages of RS, 3 h*
	2	*Atmospheric effects, resolution properties of RS and RS platforms, 3 h*
	3	*Remote sensing satellites and their properties, image processing 3 h*
	4	*Image classification and analysis (supervised and unsupervised), arithmetic processes, 3 h*
	5	*Using of satellites image for studies of land and soil, 3 h*
	6	*Land use and land cover classification according to Corine and USGS methodologies, 3 h*
	7	*Midterm exam*
	8	*Basic mapping information (scale, projections, map types, coordinate systems etc..) 3 h*
	9	*Spatial and non-spatial information systems 3 h*
	10	*Land information systems, what is GIS and its historical development 3 h*
	11	*GIS elements and their main functions, data collections 3 h*
	12	*Patial data preparation (import and export, georefenecing) 3 h*
	13	*Data arrangements (digitizing, vector and raster spatial data arrangement, styles), database management preparation of report and map designs 3 h*
	14	*Final exam*
The methods of verification and assessment criteria and principles		*For a positive grade, sum of 40% of midterm (100%) and 60% of final (100%) exams should be greater than 60.*

Literature:

Recommended Textbooks	*1- Levin, N. 1999. Fundamentals of Remote Sensing, International Maritime Academy, Trieste, Italy* *2- Tempfil K., Kerle N., Huurneman, C.G., Janssen F.L.L. 2009.Principles of Remote Sensing, ITC, The Netherlands.* *3- Rolf, A and Huisman, O. 2009. Principles of Geographic Information Systems. ITC, The Netherlands.* *4- ESRI, 2014. ArcGIS for Desktop.*
Complementary	*Current publications in scientific journals related to course issues and some course materials supported by lecturer.*

Structure of learning outcomes:

The area of study: RS&GIS, environmental science, natural resources ***6 ECTS****

The structure of student activity:

Learning Activities	***Amount***	***Time (h)***	***Total work-load (h)***
Participate in lecture	*12*	*3*	*36*
Participate in midterm exam	*1*	*2*	*2*
Individual study for midterm exam	*6*	*3*	*18*
Individual study for lectures	*12*	*1*	*12*
Laboratory study	*10*	*2*	*20*
Quiz			
Assignment	*10*	*2*	*20*
Participate in final exam	*1*	*2*	*2*
Individual study for final exam	*6*	*3*	*18*
Literature critical review			
Oral exam			
Individual study for problem solution	*11*	*2*	*22*
Consultations			
Participate in researches			
Mandatory practices and internships			
	Total workload (h)		***150***

*ECTS Credits = Total Workload (Hours) / 25 (Hours/1 ECTS) = 150 / 25 = 6 ECTS

Name Surname of Lecturer : Sign:. Date: