ERASMUS MUNDUS MASTER PROGRAMME IN SOIL SCIENCE – emiSS

2020-2021 ACADEMIC YEAR - MODULE SYLLABUS

Name of course:	
AGROCHEMISTRY	
ECTS	*6*
Type of Course	*Compulsory*
Form of Examination	*Written Examination*
Prerequisites	*Basic knowledge in the soil science, agronomy, soil microorganisms, plant phisiology and biochemistry.*

Field of Study:	
Agriculture	
Education profile	*Academic*
Code of study form and level of education	*Master of Science*
Academic year/Semester	*First year/Spring Semester*
Specialization	*Agriculture*
Language of education	*English*

The lecturer module:	
The name of faculty	*Agricultural University Plovdiv BG, Faculty of Agriculture*
The name of department	*Ahrochemistry & Soil Science*

Educational outcomes:	
Description of the learning effect	
KNOWLEDGE - student knows and understands:	
1	*Student knows the soil fertility and the ability of the soil to supply plants with nutrients (nutrient availability in the soil)*
2	*Student knows the nutrient supply to the plant and the use of these substances by the plant in process of plant nutrition*
3	*Student knows the function and importance of macro and micro nutrients, the diagnosis of deficiency and excess symptoms.*
4	*Student knows the relation soil-plant (nutrient transport from soil to plants)*
5	*Student knows the mineral and organic fertilizers and the rules for their efficient use at different type of corps.*

SKILLS - the graduate can	
1	*Student obtains the necessary scientific information from literature, databases or other sources in order to broaden and deepen his/her knowledge of study topics.*
2	*Student has the competence to make some basic analysis for determination of available nutrients into the soil.*
3	*Student will has knowledge of application of basic fertilizers on main groups of crops – field crops, vegetables, permanent crops (fruit trees and vineyards)*

SOCIAL COMPETENCES - graduate:	
1	*Student shows activity during a discussion on various issues related to transformations of forms of nutritional elements into the soil*
2	*Student can organize fertilization of grown crops in their farms and/or advise farmers about fertilization of crops*
3	*Student can work for state organizations and private companies dealing with fertilization of crops*

Course objectives and content:

This course is to acquaint the graduate students with fundamental concepts of plant nutrition with essential nutrients – nitrogen, phosphorus and potassium and microelements. Students will get familier with soil and foliar nutrition of plants. Production and rules for application of the main types of fertilizers also will be studied.

Agrochemistry		*36 hours*
Subject of lecture	1	*Research methods used in Agrochemistry. Production and consumption of industrial fertilizers in the world and in Bulgaria 3 h*
	2	*Negative effects of the use of high N fertilizer norms and other fertilizers. 3 h*
	3	*Essential plant nutrients. Foliar fertilization. Physiological reaction of fertilizers 3 h*
	4	*Nitrogen plant nutrition. Soil as a source of nitrogen for plants 3 h*
	5	*Nitrogen fertilizers 3 h*
	6	*Phosphorus plant nutrition. Soil as a source of phosphorus for plants 3 h*
	7	*Midterm exam*
	8	*Phosphorus fertilizers 3 h*
	9	*Potassium plant nutrition. Soil as a source of potassium for plants h*
	10	*Potassium fertilizers 3 h*
	11	*Plant nutrition with microelements 3 h*
	12	*Soil as a source of microelements 3 h*
	13	*Fertilizers containing microelements 3 h*
	14	*Final exam*
The methods of verification and assessment criteria and principles		*For a positive grade: student should receive at least grade 4 on midterm exam and for final exams score should be greater than 4 (excellent is 6).*

Literature:	
Recommended Textbooks	1. Bergmann W, 1992. Nutritional disorders of Plants, Gustav Fischer Verlag Jena publisher, pp. 741. 2. Brady N. 1984, The nature and properties of soils, Macmillan Publishing Co., Inc. New York, 639 p. 3. Benton Jones, Jr. 2003. Agronomic Handbook, Management of Crops, Soils, and Their Fertility, CRC PRESS, pp 372. 4. Martin P. 1993, Tropical Soils and Fertilizer Use. Longman Scientific and Technical publishe, pp. 264. 5. Mengel K., E. Kirkby, 1987. Principles of Plant Nutrition. 6. Pan Ming Huang, Yuncong Li, Malcolm E. Sumner. 2011. Handbook of Soil Sciences: Properties and Processes, Second Edition, by CRC Press 1442 Pages. 7. Rowell D. Soil Science: Methods and Applications. Longman Group UK, 1994, 350 p.
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: agricultural, soil science, 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	*12*	*2*	*24*
Quiz			
Assignment	*8*	*2*	*16*
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: Ivan Manolov Sign:..... Date: 16.01.2020