

ERASMUS MUNDUS MASTER PROGRAMME IN SOIL SCIENCE – emiSS
2020-2021 ACADEMIC YEAR - MODULE SYLLABUS

Name of course:	
<i>Plant Nutrition and Metabolism</i>	
ECTS	6
Type of Course	<i>Compulsory</i>
Form of Examination	<i>Written Examination</i>
Prerequisites	<i>Basic knowledge in the soil science, plant physiology and biochemistry, agricultural science.</i>

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

The lecturer module:	
The name of faculty	<i>Agricultural University – Plovdiv, Faculty of Agronomy</i>
The name of department	<i>Plant physiology and biochemistry</i>

Educational outcomes:	
Description of the learning effect	
KNOWLEDGE - student knows and understands:	
1	<i>Student knows the role of nutrients and their use for agricultural purposes</i>
2	<i>Student knows the methods for nutrient application and factors influencing the nutrient uptake and transportation</i>
3	<i>Student knows the principles of the metabolism of crucial nutrients like nitrogen, sulfur, and phosphorus</i>
4	<i>Student understands the relationship between nutrients and plant yield and quality</i>
SKILLS - the graduate can	
1	<i>Student obtains the necessary scientific information from literature, databases or other sources.</i>



2	<i>Student shows the ability to correctly interpret results and draw conclusions for plant status and mineral content.</i>
---	--

SOCIAL COMPETENCES - graduate:

1	<i>Student shows activity during a discussion on various issues related to plant mineral nutrition and metabolism.</i>
2	<i>Student has the competence to participate in agricultural research and discuss their results.</i>

Course objectives and content:

This course is to acquaint graduate students with fundamental concepts of advanced plant mineral nutrition and metabolism.

The main topics concern relationships among macro- and micronutrient uptake and transportation, the physiological role of macro and micronutrients; metabolism of nitrogen, sulfur, and phosphorus; nutrients and plant physiological disorders; nutrients and yield and quality.

		Plant Nutrition and Metabolism	36 hours
Subject of lecture	1	<i>Physiological role of macronutrients for plants – AV – 3h</i>	
	2	<i>Physiological role of micronutrients for plants – AV – 3h</i>	
	3	<i>Uptake of mineral nutrients by plant roots – AV – 3h</i>	
	4	<i>Influence of external factors on nutrient uptake – AV – 3h</i>	
	5	<i>Nitrogen assimilation by plants – LK – 3h</i>	
	6	<i>Biological fixation of nitrogen by plants – LK – 3h</i>	
	7	<i>Assimilation of sulphur and phosphorus by plants – LK – 3h</i>	
	8	<i>Midterm exam</i>	
	9	<i>Transport of mineral nutrients in plants – AV – 3h</i>	
	10	<i>Nutrients uptake in problematic soils and plant functional disorders – AV – 3h</i>	
	11	<i>Foliar uptake of mineral nutrients – AV – 3h</i>	
	12	<i>Plant mineral status and crop yield – AV – 3h</i>	
	13	<i>Plant mineral status and crop quality – LK – 3h</i>	
	14	<i>Final exam</i>	

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- Chesworth J.M., Stuchbury T., Scaife J.R.1998. <i>Agricultural biochemistry</i> . Chapman and Hall 2- Arteca, R., 1995. <i>Plant Growth Substances</i> . Chapman & Hall 3- Nelson D., M. Cox, <i>Lehninger Principles of Biochemistry</i> , 2000
Complementary	<i>Current publications in scientific journals related to course issues and some course materials supported by lecturer.</i>


Structure of learning outcomes:

The area of study: agricultural, plant physiology and biochemistry, environmental science, natural resources

6 ECTS*

The structure of student activity:

<i>Learning Activities</i>	<i>Amount</i>	<i>Time (h)</i>	<i>Total workload (h)</i>
Participate in lecture	12	3	36
Participate in midterm exam	1	2	2
Individual study for midterm exam	6	2	12
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	6	2	12
Consultations			
Participate in researches	8	2	16
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 AV: Andon Vasilev

Sign:.....

Date: 16.01.2020

of Lecturer LK: Lyubka Koleva

Sign:.....

Date: 16.01.2020