

## Environmental Technologies I (Soil Protection)

Code: MK5KVT1K03K117-EN

ECTS Credit Points: 3

Evaluation: exam

Year, Semester: 2<sup>nd</sup> year/1<sup>st</sup> semester

Number of teaching hours/week (lecture + practice): 2+1

### Topics:

Presentation of the causes and consequences of the most important soil degradation processes (acidification, salinisation, reduction of organic material content, soil contamination, structural depletion, soil compaction, wind and water erosion, soil sealing).

Description of the technical and agronomic possibilities of soil protection, chemical, mechanical soil amelioration and remediation, recultivation procedures suitable for mitigating adverse effects according to the following themes: forms of soil degradation; the importance of soil protection; the acidification of the environment and the soils; amelioration of acid soils; chemical, physical and biological improvement of sandy soils; natural and secondary (man-caused) sodium and salt accumulation; amelioration and land use possibilities of salt affected soils; soil structure degradation, soil compaction, improving the soil structure; problems with the soil - water system. Soil moisture regulation, improving the water management of soils; water erosion, technical and agronomic possibilities of erosion control; wind erosion and possibilities of erosion control; the concept and process of land recultivation (rehabilitation), technical and biological recultivation; technical and biological recultivation in mining exploitations and landfills; soil contamination; remediation of contaminated soils.

### Literature:

#### *Required:*

- Kátai J (2013): Applied Soil Science  
[https://www.tankonyvtar.hu/en/tartalom/tamop412A/2011\\_0009\\_Katai\\_Janos-Applied\\_Soil\\_Science/ch03s07.html](https://www.tankonyvtar.hu/en/tartalom/tamop412A/2011_0009_Katai_Janos-Applied_Soil_Science/ch03s07.html)

#### *Recommended:*

- Godone, D. (Ed.): Soil Erosion Issues in Agriculture Published: October 21st 2011; DOI: 10.5772/926, ISBN: 978-953-307-435-1
- Sarkar, A. K. (Ed.) Acid Soils: Their Chemistry and Management 2013 ISBN-10: 9381450382
- Gupta, S.K., Megh R. Goyal (Eds): Soil Salinity Management in Agriculture Technological Advances and Applications SBN: 9781771884433 E-Book ISBN: 978-1-315-36599-2 Pub Date: March 2017
- Hartge, K. H.; Horn, R.: Essential Soil Physics. An introduction to soil processes, functions, structure and mechanics. Eds.: Horton, R.; Horn, R; Bachmann, J; Peth, S. 2016. ISBN 978-3-510-65339-3, Soil Amelioration Presentation (PDF Available) 2017; Intensive Growers Association, Cedara College, Omnia, DOI:10.13140/RG.2.2.26686.08000;  
[https://www.researchgate.net/publication/316035053\\_Soil\\_Amelioration](https://www.researchgate.net/publication/316035053_Soil_Amelioration)

## Schedule

<b>1<sup>st</sup> week Registration week</b>	
<b>2<sup>nd</sup> week:</b> <b>Lecture:</b> Forms of soil degradation. The importance of soil protection. <b>Practice:</b> Practical assignments and case studies related to the lecture.	<b>3<sup>rd</sup> week:</b> <b>Lecture:</b> The acidification of the environment and the soils. <b>Practice:</b> Practical assignments and case studies related to the lecture.
<b>4<sup>th</sup> week:</b> <b>Lecture:</b> Amelioration of acid soils. <b>Practice:</b> Practical assignments and case studies related to the lecture.	<b>5<sup>th</sup> week:</b> <b>Lecture:</b> Chemical, physical and biological improvement of sandy soils. <b>Practice:</b> Practical assignments and case studies related to the lecture.
<b>6<sup>th</sup> week:</b> <b>Lecture:</b> Natural and secondary (man-caused) sodium and salt accumulation. <b>Practice:</b> Practical assignments and case studies related to the lecture.	<b>7<sup>th</sup> week:</b> <b>Lecture:</b> Amelioration and land use possibilities of salt affected soils. <b>Practice:</b> Practical assignments and case studies related to the lecture.
<b>8<sup>th</sup> week: 1<sup>st</sup> drawing week</b>	
<b>9<sup>th</sup> week:</b> <b>Lecture:</b> Soil structure degradation, soil compaction, improving the soil structure. <b>Practice:</b> Practical assignments and case studies related to the lecture.	<b>10<sup>th</sup> week:</b> <b>Lecture:</b> Problems with the soil - water system. Soil moisture regulation, improving the water management of soils. <b>Practice:</b> Practical assignments and case studies related to the lecture.
<b>11<sup>th</sup> week:</b> <b>Lecture:</b> Water erosion, technical and agronomic possibilities of erosion control. <b>Practice:</b> Practical assignments and case studies related to the lecture.	<b>12<sup>th</sup> week:</b> <b>Lecture:</b> Wind erosion and possibilities of erosion control. <b>Practice:</b> Practical assignments and case studies related to the lecture.
<b>13<sup>th</sup> week:</b> <b>Lecture:</b> The concept and process of land recultivation (rehabilitation), technical and biological recultivation. <b>Practice:</b> Technical and biological recultivation in mining exploitations and landfills.	<b>14<sup>th</sup> week:</b> <b>Lecture:</b> Soil contamination. <b>Practice:</b> Remediation of contaminated soils.
<b>15<sup>th</sup> week: 2<sup>nd</sup> drawing week</b>	

## Requirements

### A, for a signature:

Attending practices is compulsory. Attendance at the lectures is recommended. Students have to attend practice classes and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students cannot make up any practice class with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certification needs to be presented. Missed practice classes have to be made up for at a later date previously discussed with the tutor.

### B, for a grade:

The course ends in a written exam test.

The minimum requirement of the end-term test is 60%. The grade is given according to the following (score/grade): 0-59 = fail (1); 60-69 = pass (2); 70-79 = satisfactory (3); 80-89 = good (4); 90-100 = excellent (5).

If the score of the test is below 60, students can retake that test in conformity with the EDUCATION AND EXAMINATION RULES AND REGULATIONS.