

56S1-GOSPWODGL

SOIL WATER MANAGEMENT

ECTS: 3.0

HOURS PER SEMESTER/WEEK: LECTURES: 15/1; CLASSES: 30/2

FIELD OF THE STUDY: Environmental protection

Level of study: First-cycle (Engineer's degree) program

Course status: optional *

Year of the study: IV

COURSE CONTENTS

LECTURES: Soil water management. Soil water balance. Water properties of various soil types. Forms and scope of human interference in the water cycle in the soil environment. Water needs and shortages. Permissible soil moisture levels, air content, oxygen diffusion and required groundwater levels. Factors determining soil capillary seepage. Environmental hazards resulting from excessive soil compaction. The presence of defective genetic levels indicating excessive moisture. The impact of phytomelioration and agromelioration treatments on the improvement of air-water, physicochemical, biochemical and biological properties of soils. Principles of regulation of water relations of organic soils. Subsidence and disappearance of drained peatlands. Soil droughts. Protection of organic soils from drying out.

CLASSES: Soil moisture dynamics. Retention properties of soils - methods of their determination. Influence of the structure and properties of the soil profile on the air and water conditions of soils. Water conductivity of soils at full and incomplete saturation - methods of measurement and calculation. The phenomenon of capillary seepage in the soil. The phenomenon of infiltration and methods of its description. Mathematical description of water management in the soil profile. Possibilities and ways of increasing soil water retention.

EDUCATIONAL PURPOSE: Familiarize students with the criteria of water management in soils, balancing soil water resources and with the methods of recognizing air and water conditions in soils.

LEARNING OUTCOMES

Knowledge. Demonstrates knowledge of soil water management criteria and ways of determining soil water balances. Has structured and theoretically based knowledge in the field of recognizing air and water conditions in soils.

Skills. He can determine the elements of the water balance of different types of soils. He can assess air and water conditions in soils.

Social competences. Understands the need for continuous improvement of professional skills in the assessment of the impact of soil air and water conditions on the environment. He is aware of the importance and understands the non-technical aspects of soil water management.

TEACHING FORMS AND METHODS

Lectures. Lecture with a multimedia presentation.

Classes. Auditorium and design exercises.

FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES

Lectures. Colloquium partly test, partly with open questions and tasks.

Classes. Project with his presentation. Written colloquium partly test, partly with open questions and tasks.

BASIC LITERATURE

1) Srivastava P.K., Gupta M., Tsakiris G., Quinn N.W. 2020. Agricultural Water Management: Theories and Practices. Elsevier Science Publishing Co Inc., ss. 490. 2) Mishra S.R. 2014. Soil and Water Management. Discovery Publishing House Pvt Ltd, ss. 304. 3) Ali M. H. 2010. Fundamentals of Irrigation and On-farm Water Management: Volume 1. Springer New York, NY, ss. 560.

ADDITIONAL LITERATURE

1) Shepard M. 2019. Water for Any Farm: Restoration Agriculture Water Management Techniques for Any Farm. Acres U.S.A., Inc.

THE TEACHER/TEACHERS CONDUCTING THE CLASSES:

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