

# **MELIORATION AND LAND DRAINAGE**

Course Code/Course ID : 06.4-WI-ISP-mel.-P-S14\_genQK270

Type of course: compulsory

Teaching language: English

Director of studies: dr hab. inż. Michał Drab, prof. UZ

Name of lecturer: IEE teachers

Form of instruction	Number of teaching hours per semester	Number of teaching hours per week	Semester	Form of receiving a credit for a course	Points ECTS
<b>Full-time studies</b>					7
Lecture	30	2		Grade with notes	
Project	30	2		Grade with notes	

## **THE AIM OF THE LECTURE**

The aim of the course is to learn the basic knowledge of land improvement including: types of land improvement and drainage, dewatering: green areas, arable land and urban areas. Teaching students about stages of land improvement investments including project work.

## **ENTRY REQUIREMENTS**

Formal: credits for the subjects: basics of studies about earth, basics of environmental protection, technical drawing.

Informal: knowledge of pedology, geology, climatology and hydrology.

## **SCOPE OF COURSE TOPICS**

The program of lectures: Basic notions from the field of pedology: soil forming processes, physical, chemical and biological characteristics. Knowledge from the field of hydrology and metrology: wastes, evaporating, kinds of water in soils, surface outlets, winds. Causes of an excess of water in soils. Disadvantages of an excess of water in soils. Reasons for dewatering soils. Knowledge of ditches and canals. Learning about rivers: water movements, formation of river beds, designing river regulation. Possibilities of dewatering soils without drainage ditches. Types of drainage for mineral and peat soils. Designing soil drainage in different conditions. Types of surface irrigation. Dewatering industrial and urban areas..

Program of projects: design the regulation of air-water balance in soils of selected area.

## **TEACHING METHODS**

Giving methods: lecture information - problem.

Searching methods: analyzing by students the conditions and effects of phenomena for different areas; practical exercise – preparing a project for the land improvement of particular areas.

## LEARNING OUTCOMES

Symbol	Learning outcomes after completion of the course. Student:	The reference to the effects of education in the field of technical sciences
<b>Knowledge</b>		
IS1A_W00	characterises conditions determining the quantity of water in soils	T1A_W03; InzA_W03
IS1A_W00	identifies causes of the occurrence of particular conditions for water management in soils	T1A_W04; InzA_W03
IS1A_W00	explains methods of solving problems of water management in soils (land improvement systems)	T1A_W07; InzA_W01; InzA_W02; InzA_W05
<b>Skills</b>		
IS1A_U00	prepares a project for the land improvement of particular areas in particular conditions	T1A_U14; T1A_U15; T1A_U16; InzA_U08
IS1A_U00	assesses the usefulness of the solution of a problem	T1A_U09; T1A_U10; T1A_U13; InzA_U03; InzA_U05; InzA_U07
IS1A_U00	assesses benefits resulting from the implementation of a project	T1A_U13; InzA_U03; InzA_U07
IS1A_U00	reports and present results of research work	T1A_U03; T1A_U04
<b>Social competence</b>		
IS1A_K00	is active in project procedures initiated by administrative communes and municipal authorities	T1A_K03; InzA_K01
IS1A_K00	suggests solutions of problems connected to land improvement	T1A_K02; InzA_K01

## ASSESSMENT CRITERIA

The basis for passing the project classes is the attendance at all classes, systematic preparation for each class and preparation, and then - submission on time and passing the project.

Examination: the condition to take the exam is to obtain a positive grade from the laboratory exercises - the exam is in writing (2 problem questions, 2 accounting tasks).

Grading scale: 0 ÷ 50% - insufficient, 51 ÷ 60% - satisfactory, 61 ÷ 70% - satisfactory plus, 71 ÷ 80% - good, 81 ÷ 90% - good plus, 91 ÷ 100% - very good. The basis for determining the cumulative rating is the weighted average obtained by adding: 0.7 lecture scores, 0.3 grades from laboratory exercises. The weighted average is rounded to two decimal places. The total rating is based on the weighted average according to the rule: below 3.24 - sufficient, from 3.25 to 3.74 - satisfactory plus, from 3.75 to 4.24 - good, from 4.25 to 4.74 - a good plus, from 4.75 - very good.

The total mark for this course is the weighted average obtained by adding: 0.6 lecture grade and 0.4 evaluation from project classes.

## SELF STUDENT'S WORK

Independent student work (set up to: classes, exams, reading literature, dissertations, projects, presentations, reports, speeches): 90 h;

Contact hours (classes, tutorials, exams, etc.): 90 h.

### **RECOMMENDED READING**

1. C.J. Ritsema, L.W. Dekker. Soil Water Repellency: Occurrence, Consequences, and Amelioration. Elsevier 2003
2. D. Butler, J. Davies. Urban Drainage. Spon Press 2011
3. P. Smart, J.G. Herbertson. Drainage Design. Springer 1992

### **OPTIONAL READING**

1. B.S. Maslov. Agricultural Land Improvement: Amelioration and Reclamation - Volume I. EOLSS Publications 2009

### **REMARKS**