

MODULE INFORMATION SHEET

Name of Module Unit	Soil Protection – SP (Land protection)
Name in polish language	Ochrona gleb (Ochrona powierzchni ziemi)
Module type	compulsory / elective
Form of studying	full-time day courses
Level of study	undergraduate course (B.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environmental Engineering
Responsible department	Department of Environmental Protection and Management
Responsible person	Prof. nzw. dr hab. inż. Andrzej Kulig

Semester	Lectures(E)	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
4	15 (Exam)		30			5

Objectives (summary)

The purpose of the lecture is to give knowledge about basic soil characteristics, contamination and soil protection methods. Laboratories complete practical information about examination methods of physical and chemical characteristics of soils and give ability to make the field investigations and laboratory research.

Prerequisites

Chemistry, Environment Protection.

Rules of integrated grade setting

Total grade = Lecture grade x 0,5 + Laboratory grade x 0,5.

Recommended readings

1. Bednarek R., Dziadowiec H., Pokojaska U., Prusinkiewicz Z. (2004): *Badania ekologiczno-gleboznawcze*. Wydawnictwo Naukowe PWN, Warszawa.
2. Bednarek R., Prusinkiewicz Z. (2002): *Geografia gleb*. Wydawnictwo Naukowe PWN, Warszawa.
3. Białousz S., Skłodowski P. (1999): *Ćwiczenia z gleboznawstwa i ochrony gruntów*. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa.
4. *Gleboznawstwo* (1999): Podręcznik dla studentów. Wyd. IV popr. Pod red. Zawadzki S. PWRiL, Warszawa.
5. Jones A., Duck R., Reed R., Weyers J. (2002): *Nauki o środowisku. Ćwiczenia praktyczne*. Wydawnictwo Naukowe PWN, Warszawa.
6. Zawadzki S. (2002): *Podstawy gleboznawstwa*. PWRiL, Warszawa.
7. Instructions of laboratory's examinations.

Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Soil definitions (what is soil, ground, land?) and characteristics.	1	S
2	Physical and chemical properties (parameters) of soil.	3	S
3	Forms of soil degradation and need for protection of the most important soil functions.	2	S
4	Natural and anthropogenic soil erosion and organic matter decline – its environmental impacts.	2	S
5	Sources of soil pollution (mineral oil, heavy metals, PAHs, PCBs, pesticides) and pollutants characteristic. Fate of pollutants in soil and groundwater.	2	S
6	Soil investigation and quality standards (criteria) - why soil remediation? Approach to soil contamination (inventory, initial and detailed investigation).	2	S
7	Treatment of contaminated soil and groundwater: <i>in situ</i> (bioremediation, soil vapour extraction), groundwater/soil vapour treatment, <i>ex situ</i> - on/off site (landfarming, chemical extraction, thermal treatment).	2	S
8	Soil protection strategy – regulations and recommendations for soil protection (EU Soil Thematic Strategy).	1	S
Total		15	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Lecturers

Prof. nzw. dr hab. inż. Andrzej Kulig; dr inż. Agnieszka Pusz

Assessment method

Exam in a written format.

Contents of laboratory

	Topics	Time (hrs.)	Scope (S / Ex)
1	Discussion of the laboratory classes scope. Principals of the soil research. Methods of taking soil samples. Taking and preparation of soil samples for laboratory research.	3	S
2	Determination of the current and hygroscope humidity. Determination of the granulometry content with the organoleptic and ethmoidal wet methods.	3	S
3	Determination of the granulometry content of soils with Casagrande's method in modification by Prószyński.	3	S/Ex
4	Determination of the reaction, electrolytical conductivity and hydrolytic acidity. Calculation of the soil liming needs.	3	S
5	Sorptive proprieties of soils. Determination of the exchangeable alkaline cations content with Kappen method and calculation of the soil absorbing capacity and the degree of saturation of sorptive	3	S

	complex with alkaline cations. Preparation of the samples to determine the assimilable potassium in soils.		
6	Fertilizers (NPK). Determination of the potassium in soils. Preparation of the samples to determine phosphorus and nitrogen content in soils.	3	Ex
7	Determination of the assimilable forms of the nitrogen and phosphorus in soils.	3	Ex
8	Estimation of the aggressiveness of ground waters as regards ferroconcrete constructions based on the research of ground waters and building norms. Discussion and realization of the research.	3	Ex
9	Summary of the results of soils research. Presentation and discussion of the changes of physical and chemical characteristics in soil profile.	3	S
10	Final test. Catching up on laboratories. Completing classes.	3	S
Total		30	hours

S – topics listed in the legal study programme standards from 12.07.2007

Ex – extended topics

Persons responsible for laboratory

Prof. nzw. dr hab. inż. Andrzej Kulig; dr inż. Agnieszka Pusz

Assessment method for laboratory

Mandatory attendance at laboratory classes, the „entrance” tests, preparation and completion of the reports of each laboratory classes and final test.
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