MODULE INFORMATION SHEET

Name of Module Unit	**Principles of Soil Diagnostic Techniques**
Name in polish language	Techniki diagnozowania stanu gleb
Module type	compulsory / ~~elective~~
Form of studying	full-time day courses
Level of study	graduate course (M.Sc. level)
Type of study (for extra-mural courses)	-
Programme	Environmental Engineering
Speciality	Environment Protection Engineering
Responsible department	Chair of Environmental Protection and Management
Responsible person	dr hab inż. Andrzej Kulig, D.Sc. Ph.D. prof. WUT

Semester	Lectures(E)	Tutorials	Laboratory	Computer Exercises	Projects	ECTS
1	15			15	15	3

Learning outcomes (knowledge, skills, competences)

Student has in-depth **knowledge** of needs in terms of soil remediation and reclamation, techniques for soil diagnosis, soil contamination and basic remediation methods. Student has extensive knowledge of engineering graphics with the use of classical and numerical maps, using GIS software to visualize the spread of pollutants. The student has **skills** to apply appropriate numerical methods using the GIS environment to solve environmental engineering problems. The student can plan the procedure of hazard identification and assessment of the state of contaminated soil. The student has social **competences** - is aware of technical and non-technical aspects and effects of engineering activities and awareness of responsibility for jointly implemented activities.

Prerequisites

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Rules for integrated grade setting

Lectures (40%), computer exercises (30%), project (30%)

Recommended readings

1. Brimicombe A. (2010): GIS, environmental modelling and engineering. Boca Raton, Fla. etc.: CRP Press, Taylor & Francis Group
2. Pierzynski G., Sims J.T., Vance G.F. (2005) Soils and environmental quality. Boca Raton, Fla. etc.: CRP Press, Taylor & Francis Group
3. Wild A. (1993): Soils and the environment: an introduction. Cambridge University Press
4.Instructions for projects exercises.
5.Internet resources (credible website sources only!)

Contents of lectures (syllabus)

	Topics	Time (hrs.)	Scope (S / Ex)
1	Assessing of the soil condition	2	S
2	Principles and techniques of the soil diagnostics	3	S
3	Determination of the causes and extent of degradation of contaminated soils	5	S
4	Identification of needs in terms of their remediation and reclamation.	5	S
	Total	**15**	**hours**

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

Lecturers

Andrzej Kulig, D.Sc. Ph.D. prof. WUT

Assessment method

Exam

Contents of computer exercises

	Topics	Time (hrs.)	Scope (S / Ex)
1	Preparation of a project for the diagnosis of the area around the selected installation	5	S
2	Visualization of soil contamination performed in the GIS program	5	S
3	Proposal for neutralization of pollution	5	S
	Total	**15**	**hours**

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

Persons responsible for computer exercises

Mirosław Szyłak-Szydłowski, Ph.D., D.Sc.

Assessment method for computer exercises

Computer exercises task assessment

Contents of guided projects

	Topics	Time (hrs.)	Scope (S / Ex)
1	Implementation of a project involving the development of a program for diagnosing of contaminated soil along with an proposal of remediation methods.	15	S
	Total	**15**	**hours**

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

Persons responsible for guided projects

Andrzej Kulig, D.Sc. Ph.D. prof. WUT

Assessment method for guided projects

Project task assessment