Course title:	Environmental Remedial Techniques
Course title in Polish:	Techniki odnowy środowiska
Course for discipline:	Civil Engineering, Geodesy and Transport

Semester:	8	**Status of course:**	faculty	**Language:**	english
Academic year:		**Catalog number:**			

Coordinator of course:	prof. dr hab. inż. Eugeniusz Koda
Lecturer od course:	prof. dr hab. inż. Eugeniusz Koda
Executing unit:	Institute of Civil Engineering, Department of Sustainable Construction and Geodesy
Ordering unit:	Doctoral School SGGW
Assumptions, goals and description of the course:	The aim of the course is (1) to introduce doctoral students to methods used for the reclamation, remediation and revitalisation of elements of the environment, degraded due to natural causes (floods, storms, windstorms, fires, erosion) and anthropogenic factors (industry, agriculture, mining, deforestation, urbanisation, disasters and accidents). Discussion of the main processes and forms of environmental degradation and ways of technical and biological restoration of the environment. Scope of risk management. Land, groundwater and surface water quality standards. Identifying the causes of degradation of soil, water resources and landscape, the desirability and scope of environmental improvement works, rational planning of environmental restoration projects taking into account natural needs and economic constraints, forecasting the effects of environmental restoration measures.
Didactic form, number of hours:	Lecture 10h
Teaching methods:	Multimedia lecture, calculation exercises,
Limit of people in the group:	15

Learning outcomes

KNOWLEDGE - the graduate knows and understands:	**SKILLS - the graduate is able to:**	**COMPETENCES - the graduate is ready to:**
To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues	Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline	Critically evaluate the achievments in the field/discipline represented
Major general development trends in the field/discipline		Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect
		Support the ethos of scientific circles and conduct independent research

The method of verification of learning outcomes:	Evaluation of student activity on the basis of observation during classes, evaluation of oral answer / speech on the implemented project
Form of documentation of achieved learning outcomes:	The content of questions on the subject matter of exercises, individual questions on completed student projects. Individual student evaluation sheets, entry in the eHMS system.
Elements and weights of the final grade:	Final evaluation: Oral credit (project defense), including: 25% - evaluation of the project and student activity on the basis of observation during the class, 25% -- answer to questions on the project, 50% - answer to questions on the topic of lectures.
Place of the course:	

Basic and supplementary literature

Primary literature:
1. Demars K.R., Richardson G.N., Yong R.N., Chaney R.C. Dredging, remediation and containment of contaminated sediments. STP 1293. ASTM. Philadelphia. 1995.
2. Environmental Analysis and Remediation. Ed. Meyers R., New York, 1998.
3. Hester R.E., Harrison R.M. Contaminated land and its reclamation. Thomas Telford ed. London, 1997.

Complementary literature:
1. Legal acts (laws, regulations) in the field of environmental law and access to environmental information, nature protection, geological and mining law, law on protection of agricultural and forest land, law on waste, water law, construction law and law on spatial development.
2. Scientific articles from Polish and foreign journals in the field of remediation techniques.
3. Materials from scientific and technical conferences in the field of remediation.
4. Documentary materials for sites and areas subjected to remediation selected for presentation.
5. Selected standards and industry guidelines.

Comments:	non

Estimated number of hours of work of the doctoral student necessary to achieve the assumed learning outcomes:	30h

Leraning outcomes reference to the second degree characteristics of the National Qualification Framework (level 8) covering doctoral competences:

Symbol:	**Learning outcomes:**	**8 level NQF**
SD1_KW01	To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues	P8S_WG
SD1_KW02	Major general development trends in the field/discipline	P8S_WG
SD1_KU05	Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline	P8S_UW

SD1_KK01	Critically evaluate the achievments in the field/discipline represented	P8S_KK
SD1_KK03	Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect	P8S_KK
SD1_KK08	Support the ethos of scientific circles and conduct independent research	P8S_KR