

**Course name:****Restoration ecology of post-industrial sites**

ECTS	2
Course status	<i>optional, facultativ</i>
Course final assessment /evaluation of outcomes	<i>graded credit</i>
Prerequisite	

**Main field of study:****Forestry**

Educational profile	General academic
Code of studies and education level	MSc
Semester of studies	summer
Language of instruction	English

**Course offered by:**

Name of faculty offering the course	Faculty of Forestry
Name of department offering the course	Department of Forest Ecology and Silviculture
Course coordinator	prof. dr hab. inż. Marcin Pietrzykow

**Learning outcomes:**

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands			
EPB_W1	the concepts and treatments of reclamation of post-industrial sites: the course of biological reclamation, the development of new ecosystems and their dynamics, criteria for assessing the success of reclamation, some issues of ecological engineering and ecology of restoring post-industrial sites	EPB2_W01 EPB2_W02	RL
EPB_W2	the dynamic concepts and management of the post-mining ecosystem through the development of the forest ecosystem in post-mining areas, the process of soil formation and plant succession, classification of mine soils, criteria for assessing the reclamation of ecosystem productivity, nutrient circulation; post-industrial landscape management	EPB2_W03 EPB2_W05	RL
SKILLS – student is able to			
EPB_U1	assess the risk of successful reclamation in post-mining areas, plan basic technical and biological methods for stabilizing extremely contaminated and eroded post-industrial areas, and assess the correctness of basic components	EPB2_U05 EPB2_U06	RL
			RL
SOCIAL COMPETENCIES – student is ready to:			
EPB_K1	working in a group, managing a small team and preparing presentations and discussing research results	EPB2_K02 EPB2_K06	RL
EPB_K2	discussions on: reclamation of post-industrial sites, strategies of reclamation based on the example of selected post-mining areas	EPB2_K04	RL

**Teaching contents**

Lectures		12 hours
Topics	Reclamation - introduction, definition, background Balance of post-mining areas, landscape reconstruction Reclamation treatments, examples of reclamation strategies depending on climate, geology and economy - transcontinental review Dynamic concepts and ecosystem management: development of the forest ecosystem in post-mining areas, soil formation process and plant succession, mine soil classification, reclamation assessment criterion, ecosystem productivity, nutrient cycle Risk assessment in post-mining areas, drainage of acid mines, technical and biological methods for stabilizing extremely contaminated and eroded post-industrial areas	
Accomplished learning outcomes	EPB_W1, EPB_W2	

Means of verification, rules and criteria of assessment		oral credit
Classes:		18 hours
Topics	Workshops: discussion on reclamation of post-industrial sites, strategies for reclamation on the example of selected post-mining areas One-day field visit in post-mining areas: landscape management of post-mining areas, reclamation measures, forest management in post-mining areas, sustainable development of post-mining areas; practical morphology of mine soils and description of vegetation Final evaluation of experience and conclusions - presentation of a case study	
Accomplished learning outcomes		EPB_U1, EPB_K1, EPB_K2
Means of verification, rules and criteria of assessment		essay / report

#### References:

Basic	<p>1. Courtney, R., Pietrzykowski, M. 2017. Soil quality indices for evaluation of acid mine spoil. Chapter 2 (in:) Bio-Geotechnologies for mine site rehabilitation, Eds: Majeti NV Prasad, Paulo Favas, and Subodh K Maiti. Elsevier, Amsterdam-Oxford-Cambridge, p. 33 - 48.</p> <p>2. Pietrzykowski M. 2015. Reclamation and reconstruction of terrestrial ecosystems on mine sites - ecological effectiveness assessment. (Chapter 5), in: J.N. Govil et al. (ed.), Series: Energy Science and Technology, Coal Energy (Volume 2), Studium Press LLC, New Delhi, Houston, USA, p. 121-151. (available on-line at: <a href="http://wl.ur.krakow.pl/zasoby/3/chapter_Pietrzykowski2014.pdf">http://wl.ur.krakow.pl/zasoby/3/chapter_Pietrzykowski2014.pdf</a>)</p> <p>3. Pietrzykowski M., Krzaklewski W. 2017. Reclamation of mine lands in Poland. Chapter 27 (in:) Bio-Geotechnologies for mine site rehabilitation, Eds: Majeti NV Prasad, Paulo Favas, and Subodh K Maiti. Elsevier, Amsterdam-Oxford-Cambridge, p. 493-513.</p>	
Supplementary	<p>1. Barnhisel R. I., Darmody R. G., Daniels W. L., (ed.). 2000. Reclamation of drastically disturbed lands. Number 41 in the series Agronomy, Madison, Wisconsin USA Publishers</p> <p>2. Pietrzykowski M., Krzaklewski W., 2007. An assessment of energy efficiency in reclamation to forest. Ecological Engineering, 30, 341-348.</p>	

#### Structure of learning outcomes

Area of academic study: R – Agricultural sciences, L - Forestry	2 ECTS **
---	-----------

#### Structure of student activity

Contact hours	34	hrs.	1,4 ECTS**
Including:			
lectures	12	hrs.	
classes and seminars	18	hrs.	
consultations	2	hrs.	
participation in research	0	hrs.	
obligatory traineeships	0	hrs.	
participation in examination	2	hrs.	
e-learning	0	hrs.	.... ECTS**
student own work	16	hrs.	0,6. ECTS**

\*Areas of academic study in the fields of: H- humanities; S - social studies; P – biological sciences; T – technological sciences; M- medical, sport and health sciences; R – Agricultural, forestry and veterinary sciences; A – the arts

\*\* stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes