Course name: ***Ecological Corridors Restoration***

ECTS	6.0
Course status	facultative
Course final assessment /evaluation of outcomes	graded credit
Prerequisite	basics of open channel hydraulics

Main field of study: ***Engineering and Water Management***

Educational profile	General academic
Code of studies and education level	master of thesis
Semester of studies	winter or summer
Language of instruction	English

Course offered by:

Name of faculty offering the course	*Environment Engineering and Land Surveying*
Name of department offering the course	*Hydraulic Engineering and Geotechnics*
Course coordinator	*Dr. Eng. Andrzej Strużyński, Ph.D.*

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands:			
ECR_K1	*the needs and methods of close-to-nature river training. As long as the Water Frame and Flood directives are in force, student can introduce the new river structures and river training methods. The main objective of the course is understanding which practices can be used in different parts of rivers.*	*IGW2_W04* *IGW2_W13*	*T*
SKILLS – student is able to:			
ECR_S1	*identify and describe the impact of water structures on the river continuum and assess their impact on the hydraulic conditions of water flow in the river; design objects leading to improve the river habitats.*	*IGW2_U03* *IGW2_U05* *IGW2_U12*	*T*
SOCIAL COMPETENCIES – student is ready to:			
ECR_C1	*solve problems in the field of river engineering in an unusual way, by using near-nature protection of riverbeds against linear and backward erosion.*	*IGW2_K04*	*T*

Teaching contents

Lectures:	15 hours
Topics	*1. Variability of natural rivers* *2. River continuum theories* *3. River discontinuum* *4. Human impact on river morphology* *5. Influence of anthropopressure on river dynamics*

	6. River restoration technics and methods *7. Computer aided river restoration*

Accomplished learning outcomes	*ECR_K1; ECR_C1*
Means of verification, rules and criteria of assessment	*Written exam. Positive assessment should be given at least 50% of correct answers to given questions: <50% – insufficient (2.0); 50–60% – sufficient (3.0); 61–70% – satisfactory plus (3,5); 71–80% – good (4.0); 81–90% – good plus (4,5); 91–100% – very good (5.0). The share of the lecture grade in the final grade is 50%.*
Classes:	30 hours
Topics	*1. DTM input data.* *2. Natural parameters.* *3. Data export to HEC-RAS 2D.* *4. Building 2D model.* *5. Introducing natural structures.*
Accomplished learning outcomes	*ECR_S1*
Means of verification, rules and criteria of assessment	*Passing reports on exercises - a grade from exercises is an arithmetic average of formative grades. The share of the grade for the project exercises in the final grade of the subject is 50%.*

References:

Basic	*1. Przedwojski et. al., 2000. River training techniques.* *2. Hauer C., Tritthart M., Habersack H. 2008. Computer-aided mesohabitat evaluation, Part I: Background, model concept, calibration and validation based on hydrodynamic numerical modeling in: Altinakar Kokpinar, Darama, Yegen & Harmancioglu (Eds.). Int. Conf. on Fluvial Hydraulics – Fiver Flow 2008 3, 1967–1974.* *3. Poole G.C. 2002. Fluvial landscape ecology: addressing uniqueness within the river discontinuum. Freshwater Biology 47, Blackwell Science Ltd. 641–660.*
Supplementary	*1. Vannote R.L. Minshall G.W. Cummins K.W. Sedell J.R. & Cushing C.E., 1980. The river continuum concept. Canadian Journal of Fisheries and Aquatic Science, 37, 130–137.* *2. Zevenbergen C., Cashman A., Evelpidou N., Pasche E., Garvin S., Ashley R. 2011. Urban flood management. CRC Press. Taylor&Francis Group.* *3. Identification and Destignation of Heavily Modified and Artificial Water Bodies, Common Implementantion Strategy for the WFD 2000/60/EC.*

Structure of learning outcomes

Area of academic study: R – Agricultural, forestry and veterinary sciences	0.0 ECTS **
Area of academic study: T – technical sciences	6.0 ECTS**

Structure of student activity

Contact hours	57	hrs.	2.3 ECTS**
Including: lectures	15	hrs.	
classes and seminars	30	hrs.	
consultations	10	hrs.	
participation in research	0	hrs.	

obligatory traineeships	0	hrs.		
participation in examination	2	hrs.		
e-learning	0	hrs.	0.0	ECTS**
student own work	93	hrs.	3.7	ECTS**

*Areas of academic study in the fields of: A – the arts; H – humanities; M – medical, sport and health sciences; N – natural sciences; P – biological sciences; R – agricultural, forestry and veterinary sciences; S – social studies; T – engineering and technology

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