

Course name: River Training Close to Nature

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
Language of instruction	English

Course offered by:

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

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands:			
RTN_K1	<i>types of water structures close to nature, their division and classification, and the need for their use. Has expanded and in-depth knowledge of the impact of water facilities on the hydrological regime and riverbed hydraulics, and on river ecosystems.</i>	IGW2_W02 IGW2_W04	T
SKILLS – student is able to:			
RTN_S1	<i>identify and describe the impact of water devices on the environment and assess the impact of these devices on the hydraulic conditions of water flow in the river; design an object close to nature.</i>	IGW2_U04 IGW2_U05	T
SOCIAL COMPETENCIES – student is ready to:			
RTN_C1	<i>solve problems in the field of river engineering in an unusual way, by using near-nature protection of riverbeds against linear and backward erosion.</i>	IGW2_K04	T

Teaching contents

Lectures:	15 hours
Topics	<ol style="list-style-type: none"> 1. Hydrological introduction. 2. Water Framework Directive. 3. Fluvial processes in natural rivers. 4. Hydromorphological characteristics of rivers. 5. Hydraulic parameters of water flowing in river channels. River dynamics and riverbed stability.

	6. Close to nature river structures. 7. Methods of river training close to nature. 8. The examples of river naturalization projects.
Accomplished learning outcomes	RTN_K1; RTN_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. Evaluation of the river restoration – Problem 1. 2. Evaluation of the river restoration – Problem 2. 3. Evaluation of the river restoration – Problem 3.
Accomplished learning outcomes	RTN_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. Bartnik W., Banasik K., Książek L., Radecki-Pawlik A., Strużyński A. 2005. Forecasting of fluvial processes on the Skawa River within back-water reach of the Świnna Poręba reservoir, Publications of the Institute of Geophysics, Polish Academy of Sciences, Computational modeling for the development of sustainable water-resources systems in Poland, US-Poland Technology Transfer Program, monographic volume E-5 (387), Warszawa. 2. Mokwa M., tymków P., Wężyk P. 2009. Identification of flow resistance coefficients in floodplain forests using terrestrial laser scanning. <i>Studia Geotechnica et Mechanica</i> , XXXI. 3. CEN 2004. Water Quality – Guidance standard for assessing the hydromorphological features of rivers. EN-14614. European Comitee for Standarization, Brussels.
Supplementary	1. Dyrektywa 2007/60/WE Parlamentu Europejskiego i Rady z dn. 23 października 2007 r. w sprawie oceny ryzyka powodziowego i zarządzania. 2. Identification and Destignation of Heavily Modified and Artificial Water Bodies, Common Implementantion Strategy for the WFD 2000/60/EC. 3. Przedwojski et. al., 2000. River training techniques.

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