

Course name: Fluvial Geomorphology for Engineers

ECTS	6.0
Course status	<i>facultative</i>
Course final assessment /evaluation of outcomes	<i>Graded credit</i>
Prerequisite	<i>basics of physics, geography, river engineering</i>

Main field of study: Engineering and Water Management

Educational profile	<i>General academic</i>
Code of studies and education level	<i>bachelor</i>
Semester of studies	<i>winter or summer</i>
Language of instruction	<i>English</i>

Course offered by:

Name of faculty offering the course	<i>Environmental Engineering and Land Surveying</i>
Name of department offering the course	<i>Hydraulic Engineering and Geotechnics</i>
Course coordinator	<i>Dr. Eng. Karol Plesiński, 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:			
<i>FGE_K1</i>	<i>types of riverbeds. Knows channel forms of rivers and mountain streams and bedforms of lowland rivers. Knows fluvial forms associated with all water activities in the world.</i>	<i>IGW1_W04</i>	<i>T</i>
<i>FGE_K2</i>	<i>appropriate methods for checking hydrological and hydraulic calculations of facilities for maintaining rivers and mountain streams in good condition in accordance with the Water Framework Directive (WFD).</i>	<i>IGW1_W01 IGW1_W03</i>	<i>T</i>
<i>FGE_K3</i>	<i>basic engineering and geomorphological knowledge used in assessing the correct application of engineering solutions for rivers and mountain streams in relation to the WFD.</i>	<i>IGW1_W14</i>	<i>T</i>
SKILLS – student is able to:			
<i>FGE_S1</i>	<i>calculate hydrogeomorphological and sedimentological characteristics, shore and channel forming flows as well as mountain stream bed hydraulics, and is able to interpret the results obtained when assessing existing river and mountain stream maintenance devices simulating the operation of natural fluvial forms.</i>	<i>IGW1_U02</i>	<i>T</i>
<i>FGE_S2</i>	<i>use basic computer applications and perform hydrodynamic and hydromorphological calculations. Can describe phenomena and channelling processes useful for solving design issues in maintaining riverbeds and mountain streams.</i>	<i>IGW1_U06</i>	<i>T</i>
<i>FGE_S3</i>	<i>indicate the weaknesses and strengths of the adopted methodology, using professional nomenclature.</i>	<i>IGW1_U12 IGW1_U20</i>	<i>T</i>

SOCIAL COMPETENCIES – student is ready to:			
FGE_C1	<i>creative solving of unusual problems in the field of hydromorphology, hydrogeomorphology and river engineering.</i>	IGW1_K03	T
FGE_C2	<i>taking responsibility, and the importance and consequences for the environment and community of using known hydromorphological and geohydrological analysis methods.</i>	IGW1_K04	T

Teaching contents

Lectures:		15 hours
Topics	<ol style="list-style-type: none"> 1. Basic concepts and definitions of geomorphology. Fluvial sculpture – the morphogenetic activity of rivers. 2. Fluvial-denudation relief: river valleys, river terraces, inter-valley forms, levelled surfaces. 3. Theories of fluvial and denudation sculpture development. Karst sculpture. Sufis forms. The morphogenetic activity of glacial waters - glacial sculpture. 4. Geomorphology of lowland riverbeds and mountain streams. Fluvial processes shaping the catchment of rivers and streams. 5. Fluvial forms in riverbeds: bottom forms of lowland rivers and mountain stream channel forms. Linking fluvial geomorphology with hydromorphology and hydrogeomorphologia as well as ecohydrology. 6. Fundamentals of river engineering and hydraulics of river beds in the context of maintenance of these beds. Selected water constructions working as natural elements of riverbeds (e.g. in the context of grinding and plosses). 7. Coastal and dominant flows. 	
Accomplished learning outcomes		FGE_K1; FGE_K2; FGE_K3; FGE_C1; FGE_C2
Means of verification, rules and criteria of assessment		Choice test, 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	<ol style="list-style-type: none"> 1. Field trip. Objective: To acquaint students with field measuring tools used in fluvial geomorphology. Identification and observation of geomorphological processes occurring in the Carpathian river beds and the effects of their activities. 2. Analysis of a selected hydrogeomorphological process in a riverbed or river valley. Description of phenomena, processes and characteristics and their presentation. 3. Calculations and analysis of the edge flow as shaping the stream channel in the geomorphological sense. 	
Accomplished learning outcomes		FGE_S1; FGE_S2; FGE_S3
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. Radecki-Pawlik A., Hernik J. 2010. Cultural Landscapes of River Valleys.
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	<p><i>Uniwersytet Rolniczy w Krakowie, Eds., monografia, ss. 260.</i></p> <p>2. Colin R. Thorne, Richard David Hey, Malcolm David Newson. 1997. <i>Applied fluvial geomorphology for river engineering and management. John Wiley, s. 376.</i></p> <p>3. Gordon N.D., McMahon T.A., Finlayson B.L., Gippel C.J., Nathan R.J. 2004 <i>Stream Hydrology. An Interoduction for Ecologists. John Wiley & Sons, ltd, Chichester.</i></p>
Supplementary	<p>1. Radecki-Pawlik A. 2014. <i>Hydromorfologia rzek i potoków górskich – działy wybrane. Podręcznik Akademicki. Uniwersytet Rolniczy w Krakowie, s. 280.</i></p> <p>2. Klimaszewski M. 1973. <i>Geomorfologia. Wa-wa.</i></p>

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