Course name: Introduction to Water Resource Management

ECTS	*3*
Course status	*facultative*
Course final assessment /evaluation of outcomes	*graded credit*
Prerequisite	*basics of geography, mathematics and information technology*

Main field of study: Landscape Architecture

Educational profile	*General academic*
Code of studies and education level	*bachelor*
Semester of studies	*winter*
Language of instruction	*English*

Course offered by:

Name of faculty offering the course	*Faculty of Environment Engineering and Land Surveying*
Name of department offering the course	*Sanitary Engineering and Water Management*
Course coordinator	*Dariusz Młyński, Assoc. Prof.*

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands:			
IRM_K01	*the managing of water resources in sustainable development conditions, considering their protection*	*IS1_W04*	*T*
SKILLS – student is able to:			
IRM_S01	*apply probability theory for water management purposes*	*IS1_U03*	*T*
IRM_S02	*develop hydrological characteristics of surface waters*	*IS1_U06*	*T*
SOCIAL COMPETENCIES – student is ready to:			
IRM_C01	*demonstrates an active attitude towards issues related to the management and protection of the country's water resources, recognizing the need for lifelong learning*	*IS1_C01*	*T*

Teaching contents

Lectures:	15 hours
Topics	1. *Preliminary Information: definitions of water management, history of water management, legal acts of water management in Europe.* 2. *Water Resources: types of water resources, characteristics of surface water resources.* 3. *Water Resource Measurements: water depths, velocities, and flow rates.* 4. *Environmental flows.* 5. *Water needs: water needs for agriculture, municipalities and industry.* 6. *Quantitative and qualitative protection of water resources.* 7. *Water management during droughts and Floods.*

Accomplished learning outcomes	*IRM_K01; IRM_C01*
Means of verification, rules and criteria of assessment	*Single-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:		15 hours
Topics	*1. Determination of natural characteristics of water resources.* *2. Determination of water needs for municipal, agricultural, and industrial use.* *3. Determination of environmental flows.* *4. Calculation of water management balance.* *5. Concept for improving the water management balance.*	

Accomplished learning outcomes	*IRM_S01; IRM_S02*
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%.*

Field practicals:		0 hours
Topics	-	

Accomplished learning outcomes	-
Means of verification, rules and criteria of assessment	-

References:

Basic	*1. Grigg N. 2022. Water Resources Management: Principles, Methods, and Tools. Publ. Wiley, USA* *2. Singh V.P., Kumar B. 1985. Water Resources Planning and Management. Publ. Springer, USA*
Supplementary	*1. Ponce V. M. 1989. Engineering Hydrology: Principles and Practices. Publ. Prentice Hall, Upper Saddle River, USA.* *2. Maidment D. V. 1993. Handbook of Hydrology. Publ. McGraw-Hill, USA*

Structure of learning outcomes

Area of academic study: R – Agricultural, forestry and veterinary sciences	0	ECTS **
Area of academic study: T – technical sciences	3	ECTS**

Structure of student activity

Contact hours	34	hrs.	1.4	ECTS**
Including: lectures	15	hrs.		
classes and seminars	15	hrs.		
consultations	2	hrs.		
participation in research	0	hrs.		
obligatory field trips	0	hrs.		
participation in examination	2	hrs.		
e-learning	0	hrs.	0	ECTS**
student own work	41	hrs.	1.6	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