

Hydraulic Engineering

The aim of the Programme is to train highly qualified engineering specialists capable of conducting scientific or applied research, evaluating water structures and their impact on the environment using advanced scientific methods, integrating knowledge of different fields to solve theoretical and practical water management problems, analyse and model environmental changes, engineering phenomena and processes using the latest information technologies.

Description of learning outcomes	Intended learning outcomes of the Programme	Study courses of the Programme
Knowledge and abilities	To creatively apply the basics of natural sciences and mathematics and the basic principles of civil engineering and law to solve new engineering problems in hydraulic engineering, taking into account the latest achievements in the field of civil engineering.	Restoration of Disturbed Water Ecosystems; Building Legal Regulation; Optimization of Hydraulic Construction Works Processes
Engineering analysis	To collect the information necessary for engineering activities, systematize, analyze and use it to solve solutions by applying theoretical and research methods, to see and solve standard and non-standard engineering problems when detailed information is lacking.	Research Methodology; Optimization of Civil Engineering Works; Reliability of Building Structures; Research Work -1
	To apply water regime calculation and forecasting methods in the design of hydraulic structures, organizing the construction and operation of these structures, evaluate theoretical and practical innovations and respond to changing conditions.	Urban Hydrology; Optimization of Civil Engineering Works
Engineering design	To design modern water management structures and engineering systems taking into account long-term environmental impact forecasts, to provide project proposals on water quality improvement and rational use.	Computer Design of Hydraulic Structures; Restoration of Disturbed Water Ecosystems; Urban Hydrology
Fundamental and	To identify, systematize and evaluate the data required for the engineering activities of hydraulic engineering using databases and other sources of scientific and engineering information.	The Research of Hydraulic Structures; Research Work -1

applied research	To plan and perform analytical, modelling and experimental research necessary for the organization of construction, reconstruction and operation of hydraulic structures, to critically evaluate research data, substantiate and present conclusions to stakeholders of various backgrounds.	The Research of Hydraulic Structures; Hydrologic Modelling System; Research Methodology; Reliability of Building Structures; Research Work -2; Final Work of Master Degree
Solution of engineering tasks	To identify and solve water engineering problems, understand the applied methods and methodologies and their limitations, to choose engineering equipment and software, know the principles of organization of engineering activities, use modern technologies that conserve land and water resources.	Management of Investment Projects; All elective courses
Personal and social abilities	To work independently and in a team, to be a team leader, to communicate matter-of-factly with the engineering community and the general public on a national and international scale.	All courses
	To understand holistically the impact of engineering solutions on society and the environment, to be guided by professional integrity and ethical values, to understand the responsibility for hydraulic engineering activities, to evaluate and administer local and international projects in the fields of water protection, management and civil engineering.	All courses

	Study courses	ECTS	Contact work hours	Independent work hours	The form of assessment
I semester	<i>Study field courses</i>				
	<i>Compulsory :</i>				
	Computer Design of Hydraulic Structures	6	60	100	Written exam
	The Research of Hydraulic Structures	6	60	100	Written exam
	Restoration of Disturbed Water Ecosystems	6	60	100	Written exam
	Building Legal Regulation	6	60	100	Written exam
	Urban Hydrology	6	60	100	Written exam
	Totally in the semester:	30	300	500	
II se	Study courses	ECTS	Contact work hours	Independent work hours	The form of assessment

	<i>Study field courses</i>				
	<i>Compulsory :</i>				
	Hydrologic Modelling System	6	60	100	Written exam
	Optimization of Hydraulic Construction Works Processes	6	60	100	Written exam
	Research Work -1	6	3	157	Defence of research results
	<i>Study courses of another study field(-s)</i>				
	<i>Compulsory :</i>				
	Research Methodology	6	60	100	Written exam
	Management of Investment Projects	6	60	100	Written exam
	Totally in the semester:	30	243	557	
III semester	Study courses	ECTS	Contact work hours	Independent work hours	The form of assessment
	<i>Study field courses</i>				
	<i>Compulsory :</i>				
	Reliability of Building Structures	6	60	100	Written exam
	Research Work -2	6	3	157	Defence of research results
	<i>Elective:</i>	18	180	300	
	<i>Study field courses</i>				
	Environment Protection Structures	6	60	100	Written exam
	Technology of Drainage and Irrigation	6	60	100	Written exam
	Restoration of Water Bodies	6	60	100	Written exam
	Modelling of Seepage	6	60	100	Written exam
	Water Power Plants	6	60	100	Written exam
	Reconstruction of Hydraulic Structures	6	60	100	Written exam
	Wastewater Treatment Technologies	6	60	100	Written exam
Decision Support Systems For Water Management	6	60	100	Written exam	

	Building Information Modelling (BIM) in Hydraulic Engineering	6	60	100	Written exam
	Modelling of Water Supply and Sewer Systems	6	60	100	Written exam
	Inland Waterways Engineering	6	60	100	Written exam
	<i>Study courses of another study field(-s)</i>				
	Spatial Data Analysis	6	60	100	Written exam
	Management of International Projects	6	60	100	Written exam
	Totally in the semester:	30	243	557	
IV semester	Study courses	ECTS	Contact work hours	Independent work hours	The form of assessment
	Master Thesis	30	14	786	Defence of final thesis
	Totally in the semester:	30	14	786	
	Totally in the programme:	120			
	Totally for the study field courses:	90			
	Totally for the study courses of another study field:	12			
	Totally for the elective courses:	18			
	Totally for the final work:	30			

Faculty of Engineering
Group of Fields of Study Engineering Sciences
Lenght of the Programme 2 years
ECTS credits 120
Name of the Qualification Master of Engineering Sciences

Contacts

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