

COURSE SYLLABUS

Course code	1080-BU400-ISA-0408
Course name	Hydraulics and Hydrology
Course version	2027L
Level of education	first cycle programme
Form and mode of study	full-time study
Study profile	general academic profile
Field of study	Civil Engineering
Specialisation	-
Organizational unit	The Faculty of Civil Engineering
Implementing unit	The Faculty of Civil Engineering
Course unit	n/a
Course groups	-
Course status	Obligatory
Language of the course	English
Study stage code	BU000-S4-ISA-1080
Number of ECTS credits	2

Part I**01. Learning outcomes and the method of conducting classes**

Learning outcomes	see table "Learning outcomes"
Forms of classes and the number of hours in the semester	
tutorials	15,00 h
lectures	10,00 h

02. ECTS balance

Number of ECTS credits	2	
Course workload	Hours	ECTS
Total number of hours and ECTS credits for the course:		
Hours and ECTS credits for courses involving direct participation of academic teachers	27	1,08
Hours and ECTS credits involving student's independent work	23	0,92
Total	50	2,00
Number of hours involving direct participation of academic teachers:		
Hours connected with class participation	25	
Other synchronous hours	2	
Total	27	
Number of hours involving student's independent work:		
Hours for student's independent work	23	

03. Course content

Course content	Knowledge and skills in the field of hydraulics and hydrology.
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Table: Learning outcomes

Knowledge	
Outcomes code	W1
Description	The participant of the course acquires basic knowledge of issues in hydraulics and hydrology. This knowledge relates to linear and cubic structures.
Related field-of-study learning outcomes	K1_W13
Skills	
Outcomes code	U1

Part I	
Description	The participant of the subject is able to use mathematical tools and methodologies used in the design of drainage, retention basins, small bridges, and the circumference of pipe diameters.
Related field-of-study learning outcomes	K1_U01
Social competence	
Outcomes code	K1
Description	The participant of the subject acquires the competence of the scope in solving cognitive and practical problems and consulting experts in case of difficulties in solving the problem of hydraulics and hydrology on their own.
Related field-of-study learning outcomes	K1_K03
Part II	
04. Year and semester of studies	
Year	2027L
Semester	4
05. Course leader and course teachers	
Course leader	Szymon Firląg
tutorials	Szymon Firląg
lectures	Szymon Firląg
06. Course objective	
Course objective	The aim of the course Hydraulics and Hydrology can be described as multi-level, focused on providing future engineers with the necessary knowledge and skills to design, analyse and manage water-related systems. The main, overarching objective is: To prepare students to solve practical engineering problems related to water flow and its impact on structures and the environment, taking into account hydrological phenomena.
07. Teaching methods and techniques	
lectures	lecture, multimedia presentation
tutorials	exercise method, group work, individual work
08. Methods of verifying learning outcomes	
Knowledge	
Outcomes code	W1
Description	The participant of the course acquires basic knowledge of issues in hydraulics and hydrology. This knowledge relates to linear and cubic structures.
Verification methods	lectures: written test:written test tutorials: assessment of active class participation:assessment of activity during classes
Skills	
Outcomes code	U1
Description	The participant of the subject is able to use mathematical tools and methodologies used in the design of drainage, retention basins, small bridges, and the circumference of pipe diameters.
Verification methods	lectures: written test:written test tutorials: assessment of active class participation:assessment of activity during classes
Social competence	
Outcomes code	K1

Part II	
Description	The participant of the subject acquires the competence of the scope in solving cognitive and practical problems and consulting experts in case of difficulties in solving the problem of hydraulics and hydrology on their own.
Verification methods	lectures: written test:written test tutorials: assessment of active class participation:assessment of activity during classes
09. Required and recommended reading list	
Required reading	1. Hydraulics: o Chadwick, A., Morfett, J., Borthwick, M. - "Hydraulics in Civil and Environmental Engineering" o Douglas, J.F., Gasiorek, J.M., Swaffield, J.A., Jack, L.B. - "Fluid Mechanics" o Mays, L.W. (ed.) - "Water Resources Engineering" o Massey, B.S., Ward-Smith, J. - "Mechanics of Fluids" o Munjiza, A., et al. - "The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab®". 2. Hydrology: o Maidment, D.R. (ed.) - "Handbook of Hydrology". o Shaw, E.M., et al. - "Hydrology in Practice" o Viessman, W., Lewis, G.L. - "Introduction to Hydrology" o Ward, A.D., Trimble, S.W. - "Environmental Hydrology"
Recommended reading	1. Hydromechanika/CFD: o Versteeg, H.K., Malalasekera, W. - "An Introduction to Computational Fluid Dynamics: The Finite Volume Method". o Anderson, J.D. - "Computational Fluid Dynamics: The Basics with Applications". 2. Hydraulic Structures: o Novak, P., Moffat, A.I.B., Nalluri, C., Narayanan, R. - "Hydraulic Structures" (3. GIS: o Singh, V.P. - "Elementary Hydrology".
10. Other information	
Other information	-