COURSE DESCRIPTION CARD - SYLLABUS

Course name
Hydraulic structures and hydrology [S1BZ1E>BWiH]

Course

Field of study
Sustainable Building Engineering

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
English

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other
0

Tutorials
15

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

KNOWLEDGE: A student entering this subject should cover the application of physics, chemistry, strength of materials and structural mechanics. There are also means of collecting information from control sources and having the ability to cooperate within a team. SKILLS: A student starting this subject should be able to apply, obtain information from sources, use their interpretation, draw conclusions, formulate and justify opinions and have access to information about cooperation within a team. SOCIAL COMPETENCES: A student taking this subjects should be aware of the responsibility for the reliability achieved by their works and their interpretation, should have the resources to supplement and expand knowledge in the field of construction in detail, and should also have extended limitations related to construction restrictions and restrictions on further education myself.

Course objective

Characteristics of modern water management in relation to the role of hydrotechnical structures. Basic information regarding water construction facilities. Definitions and divisions of hydrotechnical facilities. Basic knowledge of river hydrology, damming structures on rivers - weirs. . General characteristics of water dams, concrete dams. Earthen dams. Dam reservoirs. Current implementation of hydrotechnical investments in Poland. Stability of damming structures - basics of designing hydrotechnical structures. Hydroelectric power plants. Foundations of hydrotechnical structures, quays. Hydrotechnical regulatory structures, water stages, coastal engineering. Locks. Inland canals. Flood protection, flood embankments - construction and methods of strengthening them. Special water structures. Sea ports. Breakwaters. Foundations of hydrotechnical structures, techniques for implementing the foundations of locks and weirs, technologies for repairing hydrotechnical structures. Presentation of selected implementations of various types of hydrotechnical structures. Development of basic hydrological curves. Calculation of runoff from urban catchments.

Course-related learning outcomes

Knowledge:
1. The student has knowledge about water engineering facilities, their types, functioning and possible uses.
2. Knows the principles of calculating hydraulic parameters necessary to solve complex engineering tasks related to the design of hydrotechnical facilities.
Skills:
1. The student is able to analyze the suitability of individual hydrotechnical structures for purposes related to water management.
2. The student is able to perform basic design calculations for a selected hydrotechnical structure
Social competence:
1. The student is responsible for the reliability of the results obtained and their interpretation
2. The student is ready to critically evaluate the knowledge he has and the content he receives, as well as critically evaluate the results of his own work
3. The student is aware of the impact of the adopted engineering solutions on the environment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during lectures is verified as part of a written test consisting of two parts: the first part - construction - related to water engineering issues and the second part related to hydrology issues.
The knowledge acquired during auditorium exercises is verified as part of a written final test conducted in the last weeks of classes.
The basic evaluation criterion is obtaining the appropriate number of points. The passing threshold is above 50% of points. Grading scale:
over 90 to 100% of points - very good (A)
over 80 to 90% of points - good plus (B)
over 70 to 80% of points - good (C)
over 60 to 70% of points - sufficient plus (D)
over 50 to 60% of points - satisfactory (E)
up to 50% of points - unsatisfactory (F)

Programme content

Various types of hydrotechnical structures, their applications and design features, and methods of calculating hydraulic parameters necessary to design selected hydrotechnical structures.

Course topics

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Teaching methods

Lecture: informative lecture, problem lecture, demonstration
Auditorium exercises: practice method (subject exercises, practice)

Bibliography

1. Visscher D.C., Hager W.H. Dam hydraulics. Wiley 1998.
2. Vanicek I., Vanciek M. Earth Structures In Transport, Water and Environmental Engineering. Springer 2008.

Breakdown of average student's workload

	Hours	ECTS
Total workload	60	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00