COURSE DESCRIPTION CARD - SYLLABUS

Course name
Construction engineering and management [S1Bud1>IPB]

Course

Field of study
Civil Engineering

Year/Semester
4/7

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
20

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
30

Number of credit points

6,00

Coordinators

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Lecturers

Prerequisites

Knowledge: Student knows the basics of construction, building physics, properties of building materials, technologies for the implementation of general construction works, the basics of planning and calculation of construction works, and is able to carry out a basic analysis of the construction process. Skills: Student is able to distinguish the basic structural elements of the building and determine their static system as well as the existing loads and impacts on the structural element. He knows the types of phenomena affecting the building and the scope of their impact. Can calculate construction works and plan their course in time. Social competences: Student is aware of the fact that the process of repair / renovation and modernization as part of the revitalization of the building is complex and will require cooperation with various entities / participants in the construction process.

Course objective

The specificity of construction in the context of project management, revitalization of building real estate, the life cycle of an object, determining the technical condition of buildings and building elements, methods of description, durability of buildings and building elements. Repairs / renovations of buildings with concrete / reinforced concrete, brick, steel, wooden and prefabricated structures. Repairs and modernization of the attic and the underground floor. Superstructure, reconstruction and expansion of buildings. Demolition and demolition works. Adaptation of buildings for people with reduced mobility. Costing and planning repair / renovation and modernization works. Tools helpful in designing and planning the implementation of projects and supporting the facility maintenance process (designing and simulating the construction process based on the main simulation methods, ie Dynamic Systems, Discrete Events, Agent Simulations).

Course-related learning outcomes

Knowledge:
Student knows what elements of the building life cycle and revitalization in relation to the building and its surroundings include.
He knows the scope of repairs / renovations and the possibility of modernization in buildings of various structures and purposes, including adapting the building to people who are not fully mobile.
He knows what the description of the technical condition of the building and its elements is, knows how the costs of repair / renovation and modernization works are estimated and plans the course of these works in time.
He knows the detailed rules for the development of construction project procedures in relation to quality management and is able to apply them in simulations.
Knows and understands the need to assess and maintain the technical conditions of the structure, using modern solutions (monoitoring, simulation, IoT).

Skills:
Student is able to use various sources that provide information about the building.
Can describe the building, its elements and elements of the building surroundings, can describe and define the type and scope of damage to building elements and elements of the building surroundings.
Can propose the scope of repair and modernization works in the building, and estimate the costs of these works and plan their course in time.
Uses advanced and specialized tools to obtain support software on the construction site.
Uses the acquired knowledge and is able to choose the appropriate simulation method or tools for solving technical tasks.

Social competences:
Student is able to formulate an opinion on the technical condition of the building and its elements.
Understands the importance of obtaining information about the building, from all possible sources, and cooperation with entities involved in the building management process and at the stage of repair / renovation and modernization works.
Knows what is the simultaneous consideration of the technical, economic and social aspect at the stage of determining the scope of repair / renovation and modernization works.
Takes responsibility for the reliability of work results and their interpretation.
It is ready to self-graduate and expand knowledge in the field of modern processes and technological solutions in construction.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Written test of the lecture.
Completion of an exercise covering the description and assessment of the technical condition of a selected building.
Implementation of a project containing three main simulation methods (exercises).

Programme content

Basics of revitalization in relation to buildings and their surroundings. Description of the technical

condition of the building, its elements and surroundings. Determining repair / renovation and modernization needs for the building and its surroundings. An example (presentation and application) of software for determining the technical condition and scope of repair / renovation and modernization works in a residential building - EPIQR system. Calculation, planning and organization of the course of repair and modernization works.
Presentation of basic simulation methods (their genesis and development), as well as the introduction and discussion of modern technologies used on the construction site (Internet of Things, Machine Learning)

Course topics

none

Teaching methods

Informative (monographic) lecture with multimedia presentation.
Project - problem method: case study, project method (team work).

Bibliography

Basic
1. Rewitalizacja nieruchomości w procesie odnowy miast, Bielniak S., Wyd. Uniw. Ekonom. w Krakowie, Kraków, 2009
2. Remonty i modernizacje budynków, zesp. autorów pod red. M. Abramowicza, Wyd. Verlag Dashofer, Warszawa, wyd. aktualiz. 2009
3. Zabezpieczenie eksploatacyjne, remonty i modernizacje obiektów budowlanych, Linczowski Cz., Stelmaszczyk G., Wyd. Pol. Świętokrzyskiej, Kielce, 2004
4. Wybrane zagadnienia eksploatacji i napraw elementów budowlanych w budynkach, Kalinowska H., CIIW Inwestprojekt, Łódź, 1999
5. Budynki i budowle. Planowanie okresu użytkowania. PN-ISO 15686-części 1- 3,:2005, PKN, Warszawa, 2005
6. Kaplinski O., Modeling of construction processes. A managerial approach., PAN, Warszawa 1997
7. Grigoryev I., AnyLogic in Three Days: Modeling and Simulation Textbook, Fifth edition, 2018
Additional
1. Zużycie obiektów budowlanych oraz podstawowe nazewnictwo budowlane, Baranowski W., WACETOB, Warszawa, 2000
2. Remonty budynków mieszkalnych - poradnik, Zaleski S. i inni, Arkady, Warszawa, 1995

Breakdown of average student's workload

	Hours	ECTS
Total workload	150	6,00
Classes requiring direct contact with the teacher	60	3,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	90	3,00