COURSE DESCRIPTION CARD - SYLLABUS

Course name
New materials and technologies [S2Bud1>NMiT]

Course

Field of study
Civil Engineering

Year/Semester
2/3

Area of study (specialization)
Structural Engineering

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
30

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

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Lecturers

Prerequisites

The student should have knowledge of building materials and concrete technology, general construction, concrete, metal and wooden structures, broadly understood construction technologies.

Course objective

The aim of the course is to show the latest achievements in the field of material engineering in construction applications and an overview of contemporary construction realizations on the construction site - high-rise construction.

Course-related learning outcomes

Knowledge:
KB_W05: knows in depth the currently used building materials and products, their properties and test methods, as well as the technologies of their production and assembly

Skills:
KB_U17: can obtain information and integrate it, make its creative interpretation and evaluation, draw conclusions, formulate and justify opinions on technologically advanced materials and structures

Social competences:
KB_K03: is ready to independently expand knowledge in the field of modern processes and technologies 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:
The knowledge acquired during the lecture is verified on a final test at the end of the semester. The exam consists of three blocks of questions. Two are indicated by the examiner, one - to be chosen by the student. Passing threshold - 70%.

Programme content

Lecture: tall buildings and aluminum-glass facades - world overview and characteristics, new concretes; methods of repairing concrete and reinforced concrete structures according to PN-EN 1504.
Classes: carrying out 4 laboratory exercises concerning concrete modification, obtaining the required mechanical properties, destructive and non-destructive control.

Course topics

Lecture: tall buildings and aluminum-glass facades - world overview and characteristics, ultra-high-performance concretes - new generations; architectural concretes - examples of buildings; cement concrete floors - applications; the role of fibers in concrete - selection rules; new generation coatings, methods of repairing concrete and reinforced concrete structures according to PN-EN 1504.
Classes: carrying out 4 laboratory exercises concerning concrete modification, obtaining the required mechanical properties, destructive and non-destructive control.

Teaching methods

Lecture: multimedia presentation + films from the implementation of selected objects.
Laboratory exercises: sample preparation and testing on measuring equipment.

Bibliography

Basic
1. Jasiczak J.: Nowoczesne materiały i technologie budowlane - wykłady dla studentów II stopnia kierunku budownictwo. Skrypt internetowy PP. S.171. 2018
2. Pawłowski A.Z.: Budynki wysokie. Wydawnictwo Politechniki Warszawskij, 2013,s.288.
3. Hajduk P.: Projektowanie podłóg przemysłowych. PWNWarszawa , 2013.
4. Urban T.: Wzmacnianie konstrukxji żelbetowych. PWN, Warszawa , 2015.
Additional
5. Orłowski Z.: Podstawy technologii betonowego budownictwa monolitycznego. PWN, Warszawa 2009.
6. Concrete industrial ground floors - A guide to design and construction.Concrete Society Technical Report No. 34.Third Edition.
7. Joan-Lluís Zamora i Mestre – Architect (DArch).Institut de Tecnologia de la Construcció de Catalunya (ITeC) (Institute of Construction Technology, Catalonia: DESIGN OF LIGHTWEIGHT FAÇADES.Architectural
Project Introduction Handbook.

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00