



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Materiały budowlane/Building materials

Course

Field of study

Sustainable Building Engineering

Area of study (specialization)

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Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

English

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

3

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

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Prerequisites

Knowledge: basic knowledge of building materials chemistry, mathematics, physics.

Skills: can use and analyse information from available literature sources.

Social competences: awareness of the need for continuous updating and supplementing of knowledge and skills.

Course objective

To introduce the students with the basic knowledge of proper selection and evaluation of quality and suitability of building materials both at the design and construction stage.



Course-related learning outcomes

Knowledge

Have knowledge in the fields of mathematics, physics, chemistry, biology and other fields of sciences suitable to formulate and solve problems concerning sustainable building engineering (civil engineering, environmental engineering and architecture).

Have knowledge of most frequently applied building and installation materials and their properties, research methods, basic elements of their design, performance and assembly technologies, methods for evaluation and maintenance of structure technical condition.

Skills

Are able to obtain information from literature, databases and other properly selected information sources; can integrate the obtained information, interpret and evaluate it, as well as draw conclusions, formulate, discuss and justify opinions.

Social competences

Take responsibility for the accuracy and reliability of working results and their interpretation.

Understand the need of team work, are responsible for the safety of their own work and team's work.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written examination on the date given at the beginning of the semester. A short oral answer at the beginning of the exercises. Colloquium at the end of the semester on the material for laboratory exercises.

Programme content

Lecture

Basic information on building material standardization. Technical properties of building materials. General classification of building materials. Test methods. Durability of building materials. Stone materials. Aggregates (light, ordinary and heavy) - properties, functional characteristics. Building ceramics - division, properties and application. Biological corrosion of wood. Asphalt and waterproofing materials - division, characteristics and application. Thermal and acoustic insulation materials, taking into account the latest nanotechnology. Metals - division, characteristics and application. Binding materials. Common and special cements, lime, gypsum. Concrete - division, properties and application. Wood - properties and applications. Basic information about plastics - division, properties and application. Building glass - division, properties and application. Attestation and quality control of building materials and products. Building mortars - division, properties and application. Preliminary information on concrete mix design. Recycling of building materials.

Laboratory

Testing of binders (correct amount of water in cement slurry, setting time, making cement beams and determining the actual strength class of cement after 28 days of curing, testing the specific surface).



Examination of natural and crushed aggregates (sieve analysis, bulk density in loose and densed state, shape indicator, dust content). Testing of ceramics (external characteristics, class designation strength, soluble salt content, basic defects, permeability and bending strength testing of tiles). Testing of the paper (modified and oxidized), tensile strength, elongation at tension. Testing of oxidized and modified asphalt (penetration, softening temperature). Testing of plastics and rubber (flame analysis of plastics, determination of hardness, testing of paint coating thickness, rubber abrasion).

Teaching methods

Informational lecture with elements of the case method, laboratory method (teamed experiments conducted by students), e-learning methods

Bibliography

Basic

Mamlouck Zaniewski, Materials for Civil and Construction Engineers, Third Edition.

Additional

Materials prepared by the teacher. Description and instructions for laboratory exercises.

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	35	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) ¹	40	1,0

¹ delete or add other activities as appropriate