**Nazwa przedmiotu:**

Building Materials II

**Koordynator przedmiotu:**

Piotr Woyciechowski, Dr hab.inż.

**Status przedmiotu:**

Obowiązkowy

**Poziom kształcenia:**

Studia I stopnia

**Program:**

Civil Engineering

**Grupa przedmiotów:**

 Obligatory

**Kod przedmiotu:**

1080-BU000-ISA-0412

**Semestr nominalny:**

3 / rok ak. 2021/2022

**Liczba punktów ECTS:**

6

**Liczba godzin pracy studenta związanych z osiągnięciem efektów uczenia się:**

presence on the lectures 30 h,
presence on the laboratory classes 45 h,
preparing to the laboratory classes 25 h,
reading of technical literature 15 h,
preparing of Reprots form laboratory classes 25 h,
consultations 4h,
preparing multimedial presentation 15 h,
preparing to the examination (sem 2 and 3) 13 h,
repetition befor examination 2h,
writen and oral examination 3h,
total 177 h.

**Liczba punktów ECTS na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich:**

presence on the lectures 30 h,
presence on the laboratory classes 45 h,
consultations 4h,
repetition befor examination 2h,
writen and oral examination 3h,
total 84 h ECTS 3,5

**Język prowadzenia zajęć:**

angielski

**Liczba punktów ECTS, którą student uzyskuje w ramach zajęć o charakterze praktycznym:**

presence on the laboratory classes 45 h,
preparing to the laboratory classes 25 h,
preparing of Reports form laboratory classes 25 h,
preparing multimedial presentation 15 h,
total 110 h ECTS 4

**Formy zajęć i ich wymiar w semestrze:**

|  |  |
| --- | --- |
| Wykład:  | 30h |
| Ćwiczenia:  | 0h |
| Laboratorium:  | 45h |
| Projekt:  | 0h |
| Lekcje komputerowe:  | 0h |

**Wymagania wstępne:**

Basic knowledge about building materials I (sem. 2),completed laboratory Building Materials 1 (sem. 2).

**Limit liczby studentów:**

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**Cel przedmiotu:**

Recognition of processes taking place in building materials; knowledge about scope of use and quality control of building materials and building products.

**Treści kształcenia:**

Binders classification, main characteristics. Lime. Gypsum. Cement. Paste and mortar. Standards and classification of cement concrete. Concrete constituents and its role in concrete mix and concrete. Aggregates and cement. Properties of fresh concrete mixture and hardened concrete. Concrete mix design. Physicochemical processes taking place during setting and hardening of concrete in different conditions. Concrete quality control. Products made of paste, mortar and concrete. Testing of basic characteristics of cement (setting time, compression strength), lime (reactivity, fineness, strength, volume changes, setting time), gypsum (setting time, strength, sieve analysis). Standard test for normal and lightweight aggregates. Composition of aggregate blend for normal concrete (iteration method).Evaluation influence of water reducing admixtures on rheological properties of fresh concrete mixture. Concrete mix design: various methods (tree equations, paste method, Paszkowski method), designing of lightweight concrete, concrete mixture production technology, sample moulding and curing, hardened concrete testing (strength, density).Testing technical properties of products made of mortar and concrete (hollow blocks, precast concrete).

**Metody oceny:**

Written and oral exam (Building materials 1and 2) after 3 semester. Laboratory: drawing up documentation of each test, colloquia.

**Egzamin:**

tak

**Literatura:**

[1] Mamlouk M., Zaniewski J.; Materials for Civil and Construction Engineers or other equivalent books;
[2] Instructions for laboratory works (internal edition of KIMB) Standards and Instructions (EN, ASTM, ACI).

**Witryna www przedmiotu:**

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**Uwagi:**

## Charakterystyki przedmiotowe

### Profil ogólnoakademicki - wiedza

**Charakterystyka W1:**

The Graduate has knowledge of the classification, standardization, properties and production of binders, aggregates, plastics used in construction, has a basic knowledge of building mortars, has knowledge about the main characteristics and application of ordinary and lightweight concrete.

Weryfikacja:

quizes, written and oral exams.

**Powiązane charakterystyki kierunkowe:** K1\_W08

**Powiązane charakterystyki obszarowe:** P6U\_W, I.P6S\_WG.o

### Profil ogólnoakademicki - umiejętności

**Charakterystyka U1:**

Graduate has the ability to perform tests on the basis of materials standards and procedures for mineral binders, construction aggregates, mortars, light and ordinary cement concretes , selected plastic products; has a basic ability to design and verify the composition of cement mortars and ordinary and light cement concretes; know how to assess compliance of the material properties with the requirements.

Weryfikacja:

assessment of the correctness of the reports of individual laboratory tests, evaluation of control samples made by the student in order to assess the correctness of the material design.

**Powiązane charakterystyki kierunkowe:** K1\_U21, K1\_U15, K1\_U12

**Powiązane charakterystyki obszarowe:** P6U\_U, I.P6S\_UW.o, III.P6S\_UW.o

**Charakterystyka U2:**

The graduate is able to work on laboratory task in team and to present its results communicatively and in accordance with standard rules for specified tests.

Weryfikacja:

Assessment of the commitment and efficiency of the team members in carrying out research; monitoring whether all members of the research team have demonstrated proficiency in all aspects of team report.

**Powiązane charakterystyki kierunkowe:** K1\_U23

**Powiązane charakterystyki obszarowe:** P6U\_U, I.P6S\_UO

### Profil ogólnoakademicki - kompetencje społeczne

**Charakterystyka K1:**

Understands the importance of and can apply the principles of sustainable development in the design and selection of building materials. Is sensitive to the preservation of natural mineral resources.

Weryfikacja:

Quiz.

**Powiązane charakterystyki kierunkowe:** K1\_K04, K1\_K05, K1\_K06

**Powiązane charakterystyki obszarowe:** P6U\_K, I.P6S\_KO