COURSE DESCRIPTION CARD - SYLLABUS

Course name
Technology of road materials [S1Bud1>TMD]

Course

Field of study
Civil Engineering

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

KNOWLEDGE: Student beginning this course should: - know at an advanced level basic building materials and their properties and technologies for their production; - know the basics of geology and soil mechanics. SKILLS: Student should: - be able to obtain information from literature, databases and other properly selected sources; - be able to plan and conduct simple laboratory experiments leading to the assessment of the quality of building materials and engineering structures, including the ability to clearly present and interpret the obtained results and draw conclusions.

Course objective

To acquaint students with the basic materials used in road construction, the technology of their production and incorporation into the road surface, as well as laboratory methods of their research.

Course-related learning outcomes

KNOWLEDGE: Student:
1. Knows the national standards in the field of materials used in road construction and legal acts necessary for the proper construction of the road surface;
2. Knows the rules of constructing road surfaces according to catalogues;

3. Knows the materials used in road construction and their properties, research methods, basic technologies of their production, specialist terminology.
SKILLS: Student:
1. Can perform basic laboratory tests of asphalts, fillers, mineral aggregates and asphalt mixtures, including presenting and interpreting the obtained results and drawing conclusions;
2. Is able to dimension road surface structures according to catalogues.
SOCIAL COMPETENCES: Student:
1. Is responsible for the reliability of the obtained results and their interpretation;
2. Understands the need for teamwork, is responsible for the safety of own and team work;
3. Is ready to independently supplement and expand knowledge in the field of modern processes and technologies in road construction.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Students" knowledge of the tactics of lectures and laboratory exercises is assessed with a written test, carried out at the last lecture in the semester. The writing test consists of 16 multiple-choice questions. The passing threshold is 50%. Students" skills are also checked during the last laboratory exercises by assessing individually prepared reports containing reports on laboratory tests.

Programme content

To communicate knowledge on: materials used in road construction, types of road construction, basics of road construction design according to catalogues, basic laboratory tests of materials used in road construction (asphalt binders, aggregates, asphalt mixtures).

Course topics

Lectures:
- Stone products in road construction;
- Precast concrete products in road construction;
- Classification and layout of road pavement layers;
- Principles of dimensioning road pavement structures according to catalogues;
- Road pavement substructure materials;
- Mineral-asphalt mixtures for road pavements;
- Road asphalts;
- Asphalt emulsions;
- Cement concrete for road pavements;
- Geosynthetics used for road construction.

Laboratory exercise:
- Determination of penetration and softening point of asphalts;
- Determination of elastic recoil of polymer-modified asphalts;
- Determination of stability and deformation of samples of mineral-asphalt mixtures;
- Determination of compaction index and void content of asphalt pavement layer.
- Preparation of a project of the composition of the mineral-asphalt mixture.

Teaching methods

Lecture: multimedia presentation
Laboratory exercises: multimedia presentation, examples given on the blackboard and laboratory tests - practical exercises.

Bibliography

Basic:
1. Piłat J., Radziszewski P., Król J., Technologia materiałów i nawierzchni asfaltowych, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2015.
2. Piłat J., Radziszewski P., Nawierzchnie asfaltowe, WKŁ, Warszawa 2010.
3. Gaweł I., Kalabińska M., Piłat J., Asfalty drogowe, WKŁ, Warszawa 2014.
4. Stefańczyk B., Mieczkowski P., Mieszanki mineralno-asfaltowe. Wykonawstwo i badania, WKŁ,

Warszawa 2008.
5. Szydło A., Nawierzchnie z betonu cementowego. Teoria, wymiarowanie, realizacja, Polski Cement, Kraków 2004.
6. Stefańczyk B. (red.), Budownictwo ogólne. Tom 1. Materiały i wyroby budowlane, Arkady, Warszawa 2009.
7. Bugajski M., Grabowski W., Geosyntetyki w budownictwie drogowym, Wydawnictwo Politechniki Poznańskiej, Poznań 1999.
Additional:
1. Stefańczyk B., Mieczkowski P., Dodatki, katalizatory i emulgatory w mieszankach mineralno-asfaltowych, WKŁ, Warszawa 2010.
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7. Wymagania Techniczne WT-4 2010, Mieszanki niezwiązane do dróg krajowych, GDDKiA Warszawa 2010.
8. Wymagania Techniczne WT-5 2010, Mieszanki związane spoiwem hydraulicznym do dróg krajowych, GDDKiA Warszawa 2010.
9. Dziennik Ustaw, 2022, poz. 1518 Rozporządzenie Ministra Infrastruktury z dnia 24 czerwca 2022 r. w sprawie przepisów techniczno-budowlanych dotyczących dróg publicznych.

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