



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Road construction I [N1Bud1>BD1]

### 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

part-time

Requirements

compulsory

### Number of hours

Lecture

20

Laboratory classes

0

Other (e.g. online)

0

Tutorials

10

Projects/seminars

20

### Number of credit points

4,00

### Coordinators

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### Lecturers

### Prerequisites

**KNOWLEDGE:** General knowledge of mathematics and physics. Knowledge of the principles of descriptive geometry and technical drawing as well as drawing up drawings using CAD programs; Knowledge of cartographic projections and basic geodetic works in construction. Basic knowledge of geology; Detailed knowledge in the field of soil mechanics and foundations of buildings; Advanced knowledge of building materials and their properties. **SKILLS:** The ability to read architectural, construction, installation and geodetic drawings and to prepare graphic documentation in a traditional way and with the use of selected CAD programs; The ability to use information technologies, Internet resources and other sources to search for information. **SOCIAL COMPETENCE:** The ability to adapt to new and changing circumstances, as well as to define priorities in the implementation of the task set by yourself and others. Responsibility for the reliability of the results of their work and their interpretation; Conduct in accordance with the principles of ethics.

## Course objective

Providing the basic elements of engineering knowledge in the field of road construction and design of road structures (i.e. roads, road intersections and road junctions). Developing basic skills to present the road structure, road intersection and road junction in the design and use phase. Preparing a graduate to participate in the process of designing and building a road, road intersection and road junction.

## Course-related learning outcomes

### KNOWLEDGE:

1. Student has detailed knowledge of road design guidelines and related technical conditions and standards;
2. Student knows the rules of constructing road construction objects;
3. Student has a basic general knowledge of the design of road transport infrastructure facilities.

### SKILLS:

1. Student can classify road elements;
2. Student is able to dimension the basic elements of the road;
3. Student knows how to prepare the road design documentation at the level of the preliminary design (program concept) with the use of basic CAD programs;
4. Student is able to apply the provisions of construction law and legal acts concerning road design.

### SOCIAL COMPETENCES:

1. Student is responsible for the reliability of the obtained results and their interpretation;
2. Student is ready to critically assess their knowledge and the content received, as well as to critically evaluate the results of their own work.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: Final test (in the form of a test) during the last lectures in the semester in the field of material provided during the lectures (according to the study plan).

Exercises and projects: Substantive and aesthetic evaluation of the prepared project documentation, systematic work (entries in the consultation card and attendance at classes), defense of the project (written or oral form). The subject and content of the project are given on the thematic card.

## Programme content

The subject is divided into 2 parts:

- 1) Design of vehicular roads
- 2) Design of road intersections.

The subject discusses the design of roads and road intersections. The division of roads, basic concepts of road engineering, computer software for road design are presented.

## Course topics

### Lectures:

History of road construction in the world and in Poland. The importance of road infrastructure in the country's economy. Basic legal acts in the field of road construction. General characteristics of the road and its users. Technical and functional classification of roads. The road "life" cycle. Basic road elements. Types of road routes and rules of road routing. Shaping the geometric elements of the road in the plan and in the longitudinal section. Road in cross section. Elements of road surface drainage. Calculation of the volume of excavations and embankments. Basic classification and characteristics of single and multi-level road and street junctions, i.e. an interchange that uses grade separation. Collision of intersections and interchanges (types of maneuvers performed by drivers). Shaping and dimensioning of the elements of the intersection approaches and the junction area. Shaping and dimensioning of interchange elements. Traffic calming methods at street intersections. Basic methods of used traffic organization systems.

### Exercises:

Discussion of issues supporting the implementation of design exercises along with a discussion of sample design solutions.

## Projects:

Design exercise 1: Developing elements of design documentation for a section of a two-way public road.

Design exercise 2: Developing elements of design documentation for a road or street intersection.

## Teaching methods

Lecture - information lecture / problem lecture / lecture with multimedia presentation.

Exercises - multimedia presentation + case study.

Projects - case study.

## Bibliography

### Basic

1. Rozporządzenie Ministra Infrastruktury z dn. 24 czerwca 2022 r. w sprawie przepisów techniczno-budowlanych dotyczących dróg publicznych (Dz.U. 2022, poz. 1518).
2. Rozporządzenie Ministra Infrastruktury z dnia 16 stycznia 2002 roku w sprawie przepisów techniczno-budowlanych dotyczących autostrad płatnych, Dz. U. Nr 12, poz. 116 ze zmianami.
3. PN-S-02205:1998 Drogi samochodowe - Roboty ziemne - Wymagania i badania.
4. PN-S-02204:1997 Drogi samochodowe - Odwodnienie dróg.
5. Wytyczne projektowania skrzyżowań drogowych. Generalna Dyrekcja Dróg Publicznych, Warszawa 2001.

### Additional

1. Sandecki T. i inni, Komentarz do warunków technicznych, jakim powinny odpowiadać drogi publiczne i ich usytuowanie - Część I: wprowadzenie, Biuro Projektowo-Badawcze Dróg i Mostów.
2. Sandecki T. i inni, Komentarz do warunków technicznych, jakim powinny odpowiadać drogi publiczne i ich usytuowanie - Część II: zagadnienia techniczne, Biuro Projektowo-Badawcze Dróg i Mostów.
3. Edel R., Odwodnienie dróg, wyd. 4, Wydawnictwa Komunikacji i Łączności, Warszawa 2008, s. 412, ISBN 978-83-206-1717-7.
4. Szling Z., Pacześniak E., Odwodnienia budowli komunikacyjnych, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2004, s. 225, ISBN 83-7085-777-9.
5. Krystek Ryszard (praca zbiorowa). Węzły drogowe i autostradowe, Wydawnictwo Komunikacji i Łączności, Warszawa 1998.
6. Szczuraszek T. Bezpieczeństwo ruchu miejskiego, WKiŁ, Warszawa 2006.
7. Tracz M., Allsop R.E. Skrzyżowania z sygnalizacją świetlną, WKiŁ, Warszawa 1990.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	120	4,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	50	2,00