Annex No. 9
to the Rector's Decision No. 35/19
as amended by Decision No. 12/22

## COURSE SPECIFICATION

| | | |
|---|---|---|
| Course code | full-time: | **B1-3-305a** |
| | part-time: | **BN1-4-404a** |
| Course title in Polish | **Budownictwo komunikacyjne** | |
| Course title in English | **Transport Engineering** | |
| Valid from academic year | **2023/2024** | |

## CURRICULAR ALIGNMENT

| | |
|---|---|
| Programme | **CIVIL ENGINEERING** |
| Level | **first-cycle** |
| Programme profile | **academic** |
| Mode of attendance | **full-time; part-time** |
| Specialism | **all** |
| Academic unit responsible for the course | **Department of Transport Engineering** |
| Course coordinator | **dr inż. Małgorzata Linek** |
| Approved by | **prof. dr hab. inż. Grzegorz Świt** |

## COURSE DESCRIPTION

| | | |
|---|---|---|
| Teaching block | | **major** |
| Course status | | **required** |
| Language of instruction | | **Polish** |
| Semester of delivery | full-time | **semester III** |
| | part-time | **semester IV** |
| Prerequisites | | **Fundamentals of Transport Engineering** |
| Exam (YES/NO) | | **YES** |
| ECTS | | **6** |

| **Mode of instruction** | | **lecture** | **class** | **lab** | **project** | **other** |
|---|---|---|---|---|---|---|
| **No. of hours per semester** | full-time | **15** | | **30** | **30** | |
| | part-time | **10** | | **24** | **24** | |

## Learning outcomes

| Category of outcome | Outcome code | Course learning outcomes | Corresponding programme outcome code |
|---|---|---|---|
| Knowledge | W01 | Students have knowledge of the location, classification and types of structures, and they know the basics of pavement structure design. | B1_W10<br>B1_W12<br>B1_W21 |
| | W02 | Students know basic design standards, regulations, and guidelines, as well as the basics of transport structures design. They have knowledge of building materials used in transport engineering. | B1_W08<br>B1_W09<br>B1_W18 |
| Skills | U01 | Students able to design cross-sections in the road alignment. | B1_U01<br>B1_U03<br>B1_U14 |
| | U02 | Students are able to design road grade solutions. | B1_U07<br>B1_U13 |
| | U03 | Students are able to perform laboratory road tests and carry out basic tests on road materials assessment quality. | B1_U13<br>B1_U16<br>B1_U23 |
| Competence | K01 | Students are able to work independently and cooperate in a team on an assigned task. They are aware of the responsibility for the safety of their individual and team's work. | B1_K01<br>B1_K05 |
| | K02 | Students are responsible for the reliability of the results obtained. | B1_K02 |
| | K03 | Students are able to formulate conclusions | B1_K04 |

## COURSE CONTENT

| Teaching mode* | Topics covered |
|---|---|
| lecture | Characteristics of various branches of transport engineering. |
| | Railroad engineering - infrastructure |
| | Highway engineering - infrastructure. Geometric design and topographic survey for roads and streets. Road pavement structures and design. |
| | Highway and airport engineering. Geometric and elevation design of maneuvering area components. Airfield pavement structures and dimensioning. |
| | The construction process of transport engineering structures. |
| lab | Occupational health and safety rules in the laboratory of road materials and pavement technology. |
| | Production of modern asphalt binders. |
| | Preparation of samples for determination of basic asphalt binder properties. |
| | Determination of needle penetration of ordinary and modified road binders according to PN-EN 1426. |
| | Determination of softening temperature using the Ring and Ball method according to EN 1427 |
| | Determination of fracture temperature of ordinary and modified asphalt using Fraass method according to PN-EN 12593. |
| | Determination of asphalt ductility according to PN-EN 13589. |

| | |
|---|---|
| project | Road circular curve design |
| | Selection of road cross-sections on the straight section and circular curve. |
| | Developing a topographic plan of a road section. |
| | Determination of the site longitudinal profile and the road vertical alignment |

## METHODS OF LEARNING OUTCOMES VERIFICATION

| Learning outcome | Verification methods | | | | | |
|---|---|---|---|---|---|---|
| | Oral examination | Written examination | Test | Project | Report | Other |
| W01 | X | X | X | X | X | |
| W02 | X | X | X | X | X | |
| U01 | | | X | X | X | |
| U02 | | | X | X | X | |
| U03 | | | X | X | X | |
| K01 | X | X | X | X | X | |
| K02 | | | X | X | X | |
| K03 | X | X | X | X | X | |

## ASSESSMENT

| Teaching mode | Assessment type | Assessment criteria |
|---|---|---|
| lecture | examination | *Obtaining at least 50% of the points from the written examination and minimum a passing grade on the oral examination* |
| lab | mark-based | *Obtaining a passing grade or higher on the report and at least 50% of the points from the in-class test* |
| project | mark-based | *A passing grade or higher on the project and at least 50% of the points from the in-class test* |

## STUDENT WORKLOAD

| ECTS weighting | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Activities | Student workload | | | | | | | | | | | |
| | | full-time | | | | | part-time | | | | | | |
| 1. | Scheduled contact hours | W | C | L | P | S | W | C | L | P | S | h | |
| | | 15 | | 30 | 30 | | 10 | | 24 | 24 | | | |
| 2. | Other (office hours, exams) | 4 | | 2 | 2 | | 4 | | 2 | 2 | | h | |
| 3 | **Total number of contact hours** | **83** | | | | | **66** | | | | | h | |
| 4. | **Number of ECTS credits for contact hours** | **3,3** | | | | | **2,6** | | | | | ECTS | |
| 5. | **Independent study hours** | **67** | | | | | **84** | | | | | h | |
| 6. | **Number of ECTS credits for independent study** | **2,7** | | | | | **3,4** | | | | | ECTS | |

| | | | | |
|---|---|---|---|---|
| 7. | **Practical hours** | **120** | **124** | h |
| 8. | **Number of ECTS credits for practical hours** | **4,8** | **5,0** | ECTS |
| 9. | **Total workload** | **150** | **150** | h |
| 10. | **ECTS credits for the course**<br>*1 ECTS credit =25 student learning hours* | **6** | | ECTS |

**READING LIST**


1. Edel R.: Odwodnienie dróg, Wydawnictwo Komunikacji i Łączności, Warszawa, 2017.
2. Młodożeniec W. S.: Budowa dróg. Podstawy projektowania. Wydawnictwo Bel Studio, Wydanie IV, 2020.
3. Nita P.: Betonowe nawierzchnie lotniskowe. Teoria i wymiarowanie konstrukcyjne, WITWL, Warszawa, 2005.
4. Nita P.: Projektowanie lotnisk i portów lotniczych, WKiŁ, Warszawa, 2014.
5. Nita P., Linek M., Wesołowski M.: Betonowe i specjalne nawierzchnie lotniskowe. Teoria i wymiarowanie konstrukcyjne, WITWL, Warszawa, 2021.
6. Rydzykowski W., Wojewódzka-Król K.: Transport, PWN, Warszawa, 2008.
7. Rozporządzenie Ministra Infrastruktury z dnia 24 czerwca 2022 r. w sprawie przepisów techniczno-budowlanych dotyczących dróg publicznych (Dz. U. 2022, poz. 1518, z późniejszymi zmianami).
8. Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 31 sierpnia 1998 r. w sprawie przepisów techniczno-budowlanych dla lotnisk cywilnych, z późniejszymi zmianami.
9. Ustawa z dnia 21 marca 1985 r. o drogach publicznych (Dz.U. 2023, poz. 645, z późniejszymi
zmianami).
10. Ustawa z dnia 28 marca 2003 r. o transporcie kolejowym (Dz. U. 2003, nr 86, poz. 789, z późniejszymi zmianami).
11. Normy badawcze (aktualne wydania).