



Subject card

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| Subject name and code | Maintenance and Diagnostics of Bridges, PG_00041245 | | | | | | |
| Field of study | Civil Engineering | | | | | | |
| Date of commencement of studies | February 2025 | | Academic year of realisation of subject | | 2025/2026 | | |
| Education level | second-cycle studies | | Subject group | | Optional subject group | | |
| Mode of study | Full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 1 | | Language of instruction | | Polish | | |
| Semester of study | 2 | | ECTS credits | | 3.0 | | |
| Learning profile | general academic profile | | Assessment form | | assessment | | |
| Conducting unit | Katedra Wytrzymałości Materiałów -> Faculty of Civil and Environmental Engineering | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr hab. inż. Mikołaj Miśkiewicz | | | | |
| | Teachers | | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 0.0 | 30.0 | 0.0 | 0.0 | 45 |
| | E-learning hours included: 0.0 | | | | | | |
| Learning activity and number of study hours | Learning activity | Participation in didactic classes included in study plan | | Participation in consultation hours | | Self-study | SUM |
| | Number of study hours | 45 | | 5.0 | | 25.0 | 75 |
| Subject objectives | The aim of the course is to familiarize students with the principles of maintaining and diagnostics of bridges. | | | | | | |
| Learning outcomes | Course outcome | | Subject outcome | | Method of verification | | |
| | [K7_U16] is able to estimate the technical condition of engineering object; can interpret the results of constructions and materials examination; | | The student is able to perform periodic inspection of the bridge. | | [SU1] Assessment of task fulfilment | | |
| | [K7_W13] has knowledge on state of the art methods on knowledge acquisition, filtration, processing and analysis | | The student has expanded knowledge of measurement methods and interpretation of results. | | [SW2] Assessment of knowledge contained in presentation | | |
| | [K7_W10] knows modern building materials as well as technologies and methods of its manufacturing and production of construction elements | | The student is able to select materials to repair bridges. | | [SW3] Assessment of knowledge contained in written work and projects | | |
| | [K7_U11] is able to plan and execute laboratory experiments to evaluate quality of construction materials and to determine strength of construction elements | | The student is able to perform diagnostic tests and interpret results. | | [SU2] Assessment of ability to analyse information | | |
| | [K7_W16] knows methods of diagnostics of engineering objects, has knowledge about different kinds of defects in constructions and its reasons; knows means of fixing and reinforcing of constructions. | | The student has expanded knowledge of measurement methods and interpretation of results. | | [SW1] Assessment of factual knowledge | | |

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| Subject contents | Lecture. 1. Basic problems of bridge maintenance. 2. Damages and failures of engineering objects 3. Inspections of bridge structures. 4. Exploitation of bridge structures. 5. Maintenance of road and rail engineering facilities. 6. Diagnostics of engineering structures. 7. Modernization of engineering facilities. Exercises. 1. Presentation and use of diagnostic methods 2. Inspection of the bridge 3. Assessment of the load capacity of the selected engineering object | | |
| Prerequisites and co-requisites | Required completion of the course "Bridges and tunnels", , "Mosty stalowe", "Mosty betonowe" (1st degree) | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Execution of the extended bridge inspection with the load capacity assessment | 60.0% | 50.0% |
| | Answers to questions about the content presented during the lecture. | 60.0% | 50.0% |
| Recommended reading | Basic literature | 1. A. Jarominiak, Podstawy utrzymania mostów, OWPRz, Rzeszów, 1999. 2. A. Madaj, W. Wolowicki, Budowa i utrzymanie mostów. WKŁ, Warszawa, 2001. 3. J. Bień, Uszkodzenia i Diagnostyka Obiektów Mostowych, WKŁ, Warszawa, 2010. 4. H. Czupek, A. Wysokowski: Trwałość mostów drogowych. WKŁ, Warszawa, 2005. 5. GDDKiA, Instrukcje przeprowadzania przeglądów drogowych obiektów inżynierskich. Zarządzenie nr 14 z dnia 7 lipca 2005 r. 6. PKP PLK, Instrukcja utrzymania kolejowych obiektów inżynierskich na liniach kolejowych do prędkości 200/250 km/h, Id-16, 2014 | |
| | Supplementary literature | K. Flaga, Diagnostyka obiektów mostowych z betonu. Mosty, Warszawa, 2015.E. Zabawa, Newralgiczny element. Utrzymanie drogowych obiektów mostowych. Autostrady, 2012.A. Jarominiak, A. Rosset, Katastrofy i awarie mostów. WKŁ, Warszawa, 1986 | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | What is the assessment of the suitability for use of a bridges?What factors have influence on the technical condition of the bridges?What are the strategies of managing the engineering infrastructures?List the strain measurement methods used in the diagnostics of the engineering infrastructures. | | |
| Work placement | Not applicable | | |

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