



## Subject card

|  |  |  |   |                                     |  |            |     |
|--|--|--|---|-------------------------------------|--|------------|-----|
| Subject name and code  | Bridges, PG_00040225   |  |   |                                     |  |            |     |
| Field of study   | Civil Engineering  |  |   |                                     |  |            |     |
| Date of commencement of studies                                | February 2025  |  | Academic year of realisation of subject   |                                     | 2024/2025  |            |     |
| Education level  | second-cycle studies   |  | 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  | 1  |  | ECTS credits  |                                     | 2.0  |            |     |
| Learning profile   | general academic profile   |  | Assessment form   |                                     | assessment   |            |     |
| Conducting unit  | Department of Railway Engineering -> Faculty of Civil and Environmental Engineering  |  |   |                                     |  |            |     |
| Name and surname of lecturer (lecturers)                       | Subject supervisor   |  | dr hab. inż. Krzysztof Żółtowski  |                                     |  |            |     |
|  | Teachers   |  |   |                                     |  |            |     |
| Lesson types and methods of instruction                        | Lesson type  | Lecture  | Tutorial  | Laboratory                          | Project  | Seminar    | SUM |
|  | Number of study hours  | 30.0   | 15.0  | 0.0                                 | 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   |   | 2.0                                 |  | 8.0        | 55  |
| Subject objectives   | <p>The aim of the course is to supplement the basic knowledge of bridge engineering and its extension. During the lectures, basic concepts and issues related to the design of the bridge crossing and shaping of communication bridge structures are discussed. The following specific topics are discussed: types of bridge structures, bridge supports, foundations, piers, abutments,, concrete, reinforced concrete and prestressed spans, steel and composite spans, bridge equipment.</p> <p>As part of the exercises, students perform static and strength calculations of selected bridge construction issues.</p>                                |  |   |                                     |  |            |     |
| Learning outcomes  | Course outcome   |  | Subject outcome   |                                     | Method of verification   |            |     |
|  | [K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements   |  | Encyclopedic knowledge of bridge structures.  |                                     | [SW1] Assessment of factual knowledge                                |            |     |
|  | [K7_K03] can think and act creatively and enterprisingly and works for society   |  | Is able to assess and assign different types of bridge structures to commonly established groups by assigning a static scheme and mechanical features and purpose |                                     | [SK5] Assessment of ability to solve problems that arise in practice |            |     |
| Subject contents   | <p>Designing of bridge crossing, supports in bridge engineering. Small concrete, reinforced concrete and prestressed spans, cross-section shaping of beam and slab spans, prefabrication of concrete spans. Large reinforced concrete and prestressed spans, construction technology.</p> <p>Small steel and composite spans, shaping of the cross-section, prefabrication of steel spans, composite spans. Large steel beam spans, truss spans.</p> <p>Large bridges of composit construction: arched, cable stayed, ribbon, suspended.</p> <p>Bridge equipment: bearings, expansion joints, drainage, insulation, road surfaces and safety elements.</p> |  |   |                                     |  |            |     |
| Prerequisites and co-requisites                                | Completed course of building mechanics, material strength, metal constructions, concrete constructions   |  |   |                                     |  |            |     |
| Assessment methods and criteria                                | Subject passing criteria   |  | Passing threshold   |                                     | Percentage of the final grade  |            |     |
|  | test and passing exercises   |  | 50.0%   |                                     | 100.0%   |            |     |
| Recommended reading  | Basic literature   |  | Fritz Leonhardt. Bridges: Aesthetics and Design   |                                     |  |            |     |
|  | Supplementary literature   |  | internet  |                                     |  |            |     |
|  | eResources addresses   |  | Adresy na platformie eNauczanie:  |                                     |  |            |     |
| Example issues/<br>example questions/<br>tasks being completed |  |  |   |                                     |  |            |     |
| Work placement   | Not applicable   |  |   |                                     |  |            |     |

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