



## Subject card

|                                             |                                                                                                                                                                  |                                                          |                                |                                     |                   |            |     |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------|-------------------------------------|-------------------|------------|-----|
| Subject name and code                       | , PG_00069273                                                                                                                                                    |                                                          |                                |                                     |                   |            |     |
| Field of study                              | Remonty i modernizacje budynków                                                                                                                                  |                                                          |                                |                                     |                   |            |     |
| Date of commencement of studies             | October 2022                                                                                                                                                     | Academic year of realisation of subject                  |                                |                                     | 2025/2026         |            |     |
| Education level                             | first-cycle studies                                                                                                                                              | Subject group                                            |                                |                                     |                   |            |     |
| Mode of study                               | Full-time studies                                                                                                                                                | Mode of delivery                                         |                                |                                     | at the university |            |     |
| Year of study                               | 4                                                                                                                                                                | Language of instruction                                  |                                |                                     | Polish            |            |     |
| Semester of study                           | 7                                                                                                                                                                | ECTS credits                                             |                                |                                     | 3.0               |            |     |
| Learning profile                            | general academic profile                                                                                                                                         | Assessment form                                          |                                |                                     | assessment        |            |     |
| Conducting unit                             | Department of Building Structures and Material Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology     |                                                          |                                |                                     |                   |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                               |                                                          | dr hab. inż. Łukasz Skarżyński |                                     |                   |            |     |
|                                             | Teachers                                                                                                                                                         |                                                          | dr hab. inż. Łukasz Skarżyński |                                     |                   |            |     |
| Lesson types                                | 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                                                       |                                | 4.0                                 |                   | 26.0       | 75  |
| Subject objectives                          | The aim of the course is for students to acquire knowledge about possible solutions for strengthening masonry, wooden, steel and reinforced concrete structures. |                                                          |                                |                                     |                   |            |     |

| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                      | Subject outcome                              | Method of verification                                                                                                                                                                                                                                                                         |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | [K6_K01] Is aware of the key aspects of professional, ethical and social responsibility related to management, business operation, decision making and opinion formulation in civil engineering.                                                                                                                                                                                    | Student has general knowledge in this field. | [SK5] Ocena umiejętności rozwiązywania problemów występujących w praktyce<br>[SK1] Ocena umiejętności pracy w grupie                                                                                                                                                                           |
|                                 | [K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint                                                                                                                                                                                                                                      | Student has general knowledge in this field. | [SU2] Ocena umiejętności analizy informacji                                                                                                                                                                                                                                                    |
|                                 | [K6_W06] Demonstrates practical knowledge and understanding of materials, devices and tools, processes and technologies in the field of civil engineering (and their limitations).                                                                                                                                                                                                  | Student has general knowledge in this field. | [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym<br>[SW2] Ocena wiedzy zawartej w prezentacji                                                                                                                                                                                 |
|                                 | [K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment                                                                                                                                                                                                               | Student has general knowledge in this field. | [SW2] Ocena wiedzy zawartej w prezentacji                                                                                                                                                                                                                                                      |
|                                 | [K6_U06] Conduct engineering activities in civil engineering subject area, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.                                                                                                                                                                                  | Student has general knowledge in this field. | [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania<br>[SU4] Ocena umiejętności korzystania z metod i narzędzi<br>[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu<br>[SU2] Ocena umiejętności analizy informacji<br>[SU1] Ocena realizacji zadania |
| Subject contents                | <p>Course content – lecture</p> <ol style="list-style-type: none"> <li>1. Analysis of legal conditions.</li> <li>2. Methodology for strengthening masonry structures.</li> <li>3. Methodology for strengthening timber structures.</li> <li>4. Methodology for strengthening steel structures.</li> <li>5. Methodology for strengthening reinforced concrete structures.</li> </ol> |                                              |                                                                                                                                                                                                                                                                                                |
|                                 | <p>Course content – exercises</p> <ol style="list-style-type: none"> <li>1. Design task for strengthening a masonry element.</li> <li>2. Design task for strengthening a wooden element.</li> <li>3. Design task for strengthening a steel element.</li> <li>4. Design task for strengthening a reinforced concrete element.</li> <li>5. Presentation of design tasks.</li> </ol>   |                                              |                                                                                                                                                                                                                                                                                                |
| Prerequisites and co-requisites |                                                                                                                                                                                                                                                                                                                                                                                     |                                              |                                                                                                                                                                                                                                                                                                |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                            | Passing threshold                            | Percentage of the final grade                                                                                                                                                                                                                                                                  |
|                                 | Project                                                                                                                                                                                                                                                                                                                                                                             | 50.0%                                        | 40.0%                                                                                                                                                                                                                                                                                          |
|                                 | Colloquium                                                                                                                                                                                                                                                                                                                                                                          | 50.0%                                        | 60.0%                                                                                                                                                                                                                                                                                          |

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|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                             | <p>1. Maślowski E., Spiżewska D.: Wzmacnianie konstrukcji budowlanych. Arkady 1999.</p> <p>2. Małyszko L., Orłowicz R.: Konstrukcje murowe zarysowania i naprawy. Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie 2000.</p> <p>3. Konstrukcje murowe Lech Rudziński Politechnika Świętokrzyska 2006.</p> <p>4. Naprawy Elementów Budowlanych w budynkach mieszkalnych realizowanych metodami uprzemysłowionymi. Inwestprojekt Łódź 1994.</p> <p>5. Trwałość i skuteczność napraw obiektów budowlanych. Dolnośląskie Wydawnictwo Edukacyjne 2007.</p> <p>6. Mitel A., Stachurski W., Suwalski J.: Awarie konstrukcji betonowych i murowych. Arkady 1973.</p> <p>7. Materiały Konferencyjne: Warsztat Pracy Projektanta Konstrukcji WPPK. Ustroń-Wisła-Szczyrk 1998-2008.</p> <p>8. Materiały informacyjne firm zajmujących się opracowywaniem i wdrażaniem nowych rozwiązań technologicznych oraz konstrukcyjno-materiałowych w budownictwie ogólnym.</p> |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                     | No requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Example issues/<br>example questions/<br>tasks being completed | <p>1. Develop a reinforcement for the masonry pillar between the windows.</p> <p>2. Develop a reinforcement for the rafters of a wooden collar beam roof.</p> <p>3. Develop a reinforcement for the steel roof truss girder.</p> <p>4. Develop a reinforcement for the structural elements of a reinforced concrete slab-ribbed ceiling.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Practical activities within<br>the subject                     | Not applicable                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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