



## Subject card

|                                             |                                                                                                                                                                                                                           |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Mechanics of Materials B, PG_00069308                                                                                                                                                                                     |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
| Field of study                              | Civil Engineering                                                                                                                                                                                                         |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2023                                                                                                                                                                                                              |                                                          | Academic year of realisation of subject                                                                                                                          |                                     | 2026/2027                                                                                                            |            |     |
| 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                                                                                                                                                     |                                     | 1.0                                                                                                                  |            |     |
| Learning profile                            | general academic profile                                                                                                                                                                                                  |                                                          | Assessment form                                                                                                                                                  |                                     | assessment                                                                                                           |            |     |
| Conducting unit                             | Department of Mechanics of Materials and Structures -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology                                                                     |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                        |                                                          | prof. dr hab. inż. Jacek Chrościelewski                                                                                                                          |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                  |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                               | Lecture                                                  | Tutorial                                                                                                                                                         | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                     | 15.0                                                     | 0.0                                                                                                                                                              | 0.0                                 | 0.0                                                                                                                  | 0.0        | 15  |
|                                             | E-learning hours included: 0.0                                                                                                                                                                                            |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
|                                             | eNauczanie source address: <a href="https://enauczanie.pg.edu.pl/2025/course/view.php?id=2230">https://enauczanie.pg.edu.pl/2025/course/view.php?id=2230</a>                                                              |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
| 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                                                                                                                                                                                                     | 15                                                       |                                                                                                                                                                  | 1.0                                 |                                                                                                                      | 9.0        | 25  |
| Subject objectives                          | Determining the influence of time and environment on the strength properties of materials. Discussing the concepts of creep and relaxation. Discussing fracture. Understanding materials such as composites and auxetics. |                                                          |                                                                                                                                                                  |                                     |                                                                                                                      |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                            |                                                          | Subject outcome                                                                                                                                                  |                                     | Method of verification                                                                                               |            |     |
|                                             | [K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment                                                     |                                                          | The student has knowledge of the impact of materials used in the investment process on the environment                                                           |                                     | [SW1] Assessment of factual knowledge                                                                                |            |     |
|                                             | [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.                          |                                                          | The student has knowledge of professional, ethical and social responsibility related to activities in the construction industry                                  |                                     | [SK3] Assessment of ability to organize work<br>[SK5] Assessment of ability to solve problems that arise in practice |            |     |
|                                             | [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.                        |                                                          | The student solves design tasks and problems. He or she is able to prepare a report on the activities performed, such as calculations or design tasks.           |                                     | [SU1] Assessment of task fulfilment                                                                                  |            |     |
|                                             | [K6_W06] Demonstrates practical knowledge and understanding of materials, devices and tools, processes and technologies in the field of civil engineering (and their limitations).                                        |                                                          | The student has theoretical and practical knowledge of materials used in the construction industry, understands their properties, and is able to determine them. |                                     | [SW1] Assessment of factual knowledge                                                                                |            |     |
|                                             | [K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint                                                                            |                                                          | The student is able to design building structures made of various building materials, knows their properties and impact on the natural environment.              |                                     | [SU1] Assessment of task fulfilment                                                                                  |            |     |

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| Subject contents                                               | Course content – lecture<br><br>The influence of time and environment on the strength properties of materials.<br>Selected issues related to creep and relaxation.<br>Selected issues related to fracture.<br>Selected issues related to the stability of frame elements.<br>Selected issues related to modern materials, such as composites and auxetics. |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |
| Prerequisites and co-requisites                                | Basic knowledge of:<br>- structural mechanics<br>- strength of materials<br>- experimental methods in the strength of materials                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                   | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                  | Percentage of the final grade |
|                                                                | test                                                                                                                                                                                                                                                                                                                                                       | 60.0%                                                                                                                                                                                                                                                                                                                                                                                                                                              | 100.0%                        |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                           | Bielewicz E.: Wytrzymałość materiałów. Politechnika Gdańska, Gdańsk 1968, 1972, 1977, 1980, 1984, 2001, 2006.<br>Dyląg Z., Jakubowicz A., Orłowski Z.: Wytrzymałość materiałów, tom I, Wydawnictwa Naukowo-Techniczne, 2003.<br>Dyląg Z., Jakubowicz A., Orłowski Z.: Wytrzymałość materiałów, tom II, Wydawnictwa Naukowo-Techniczne, 2003.<br>Chróścielewski J.: Materiały pomocnicze do wykładu z Mechaniki Materiałów (na portalu eNauczanie). |                               |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                   | Jastrzębski P., Mutermilch J., Orłowski W.: Wytrzymałość materiałów. Arkady, Warszawa 1974.                                                                                                                                                                                                                                                                                                                                                        |                               |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |
| Example issues/<br>example questions/<br>tasks being completed | What is creep?<br>What is relaxation?<br>What rheological models describe creep/relocation phenomena?                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |
| Practical activities within the subject                        | Not applicable                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                               |

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