



## Subject card

|   |  |  |                                     |            |                   |         |     |
|---|--|--|-------------------------------------|------------|-------------------|---------|-----|
| Subject name and code                       | , PG_00064623  |  |                                     |            |                   |         |     |
| Field of study                              | Civil Engineering  |  |                                     |            |                   |         |     |
| Date of commencement of studies             | October 2023   | Academic year of realisation of subject                  |                                     |            | 2024/2025         |         |     |
| Education level                             | first-cycle studies  | Subject group  |                                     |            |                   |         |     |
| Mode of study                               | Part-time studies  | Mode of delivery   |                                     |            | at the university |         |     |
| Year of study                               | 2  | Language of instruction                                  |                                     |            | Polish            |         |     |
| Semester of study                           | 3  | ECTS credits   |                                     |            | 4.0               |         |     |
| Learning profile                            | general academic profile   | Assessment form  |                                     |            | exam              |         |     |
| Conducting unit                             | Katedra Wytrzymałości Materiałów -> Faculty of Civil and Environmental Engineering   |  |                                     |            |                   |         |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   | mgr inż. Lucyna Grabarczyk                               |                                     |            |                   |         |     |
|   | Teachers   | mgr inż. Lucyna Grabarczyk                               |                                     |            |                   |         |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial                            | Laboratory | Project           | Seminar | SUM |
|   | Number of study hours  | 15.0   | 0.0                                 | 15.0       | 0.0               | 0.0     | 30  |
|   | 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  | 30   | 0.0                                 |            | 0.0               | 30      |     |
| Subject objectives                          | Acquainted with the classification and determination of technical characteristics of concrete components, concrete mixtures and hardened concrete; selection of concrete components and determination of concrete composition, classification and use of concrete, basic technological processes in concrete production. |  |                                     |            |                   |         |     |

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| Learning outcomes  | Course outcome  | Subject outcome   | Method of verification   |
|  | [K6_K03] Can effectively, clearly and unambiguously convey information, describe activities and communicate their results/outcomes to engineers or a wider audience using appropriate communication methods and tools.  | The student is able to prepare research results in the form of a presentation, analyze and present them to the group.   | [SK4] Assessment of communication skills, including language correctness |
|  | [K6_W05] Demonstrate knowledge and understanding of research methods (obtaining information, simulations, experimental methods) in the field of civil engineering.  | The student selects appropriate ingredients (type of aggregate, cement, admixture, additive) and methods of designing ordinary concrete.  | [SW3] Assessment of knowledge contained in written work and projects     |
|  | [K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.  | The student knows the properties of concrete components. The student is able to perform basic tests of concrete mix and concrete.   | [SU1] Assessment of task fulfilment                                      |
|  | [K6_W02] Demonstrate knowledge and understanding of the processes and established methods of analysis / solution of engineering issues & problems in the field of civil engineering and of their limitations.   | The student knows the basic ingredients of concrete. The student knows the basic methods of testing the components of concrete, concrete mixture and concrete. The student designs ordinary concrete. The student knows the methods of transporting concrete mix. The student knows concrete care methods. The student is able to design concrete in accordance with PN-EN 206:2014   | [SW3] Assessment of knowledge contained in written work and projects     |
| [K6_U01] Apply knowledge and understanding of mathematics as well as sciences and engineering disciplines underlying civil engineering to solve engineering problems and issues. | The student designs concrete taking into account the purpose, method of placing and compacting the concrete mixture.  | [SU3] Assessment of ability to use knowledge gained from the subject  |  |
| Subject contents   | The origin and definition of concrete. Concrete components: binders, aggregates, admixtures, additives according to current standards. Basic properties of binders. Lime and gypsum binders; types and properties. Cement types and classifications. Main and secondary components, chemical and mineral composition. Special cements. aggregates; classification, origin, properties. Make-up water. Admixtures and additions. Concrete mix - consistency, workability, homogeneity. Selected methods of concrete mix composition design. Concrete mix testing. Concrete testing. Analysis of concrete test results. Concrete mix production. Vibrate. Effect of temperature on young concrete. Concrete care. |   |  |
| Prerequisites and co-requisites  |   |   |  |
| Assessment methods and criteria  | Subject passing criteria  | Passing threshold   | Percentage of the final grade  |
|  | Test  | 50.0%   | 50.0%  |
|  | Report on laboratory tests  | 100.0%  | 50.0%  |
| Recommended reading  | Basic literature  | 1. Jamrózy Z.; Beton i jego technologie. PWN Warszawa, 2000<br>2. Kluz T., Eman K.: -Projektowanie betonów. Arkady Warszawa 1969.<br>3. Neville A. M.: Właściwości betonu, Polski Cement Kraków 2000<br>4. Małolepszy J.; Deja J; Brylicki W, Gawlicki M: -Technologia betonu. Metody badań<br>5. Piasta J., Piasta W.: - Beton zwykły.<br>6. <a href="https://pl.scribd.com/doc/54313994/Technologia-betonu">https://pl.scribd.com/doc/54313994/Technologia-betonu</a> |  |

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|  | Supplementary literature   | 1. Praca zbiorowa. Budownictwo ogólne tom 1 i 2 Arkady 2005, 2006<br><br>2. Bukowski B.; Kuczyński: Budownictwo betonowe. Tom I i II. Arkady, Warszawa 1977  |
|  | eResources addresses   | Adresy na platformie eNauczanie:<br>Technologia betonu - NST - 2024/25 - Moodle ID: 41835<br><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41835">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=41835</a> |
| Example issues/<br>example questions/<br>tasks being completed | 1. Discuss the components of concrete.<br>2. Discuss 1 concrete design method.<br>3. Discuss the test methods for concrete mix and concrete. |  |
| Work placement   | Not applicable   |  |

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