GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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| Subject name and code | Complicated concrete structures, PG_00041063 | | |
| 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 | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |
| 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 | 4.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Concrete Structures -> Faculty of Civil and Environmental Engineering | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Marek Wesołowski | |
| | 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 | 15.0 | 0.0 | 60 |

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 | 60 | 5.0 | 35.0 | 100 |

Subject objectives

Designing methods of a R-C tanks, shell structures and folded plates.

Learning outcomes

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry construtions and its details | Student defines designing methods of a R-C tanks, shell structures and folded plates. | [SU3] Assessment of ability to use knowledge gained from the subject |
| [K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements | Student defines designing methods of a R-C tanks, shell structures and folded plates. | [SW1] Assessment of factual knowledge |
| [K7_W15] has deep and adequate knowlege of civil engineering, within offered specialization and profile | Student defines designing methods of a R-C tanks, shell structures and folded plates. | [SW1] Assessment of factual knowledge |
| [K7_W04] has knowledge on advanced strength of materials, modeling and optimisation of materials and constructions; has knowledge of fundamentals of Finite Element Method and general nonlinear analysis of engineering constructions and systems | Student defines designing methods of a R-C tanks, shell structures and folded plates. | [SW1] Assessment of factual knowledge |
| [K7_K01] is aware of necessity of professional competences improvement; obeys the professional ethics code | Student defines designing methods of a R-C tanks, shell structures and folded plates. | [SK2] Assessment of progress of work |

Subject contents

Basic types of loads and their combinations in terms of the Eurocodes. Reminder basic information about rectangular tanks for liquids. Design of cylindrical tanks and water towers. Calculation and construction of Reimbert's and Intze's reservoirs. Check the tank due to leakage, scratches and thermal influences. R-C folded plates – examples of implementation. Beam analogy method for long folded plates. The Ehlers concept of calculating of folded plates. Dimensioning and construction of reinforced concrete folded plates. Introduction of shells – examples of implementation. State of the membrane and flexion coatings, load balanced rotation. Calculation and construction of domes in various states of loads.

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| Prerequisites and co-requisites | | | |
| Assessment methods and criteria | Subject passing criteria | Passing threshold | Percentage of the final grade |
| | Midterm colloquium | 50.0% | 50.0% |
| | Project | 50.0% | 50.0% |
| Recommended reading | Basic literature | 1. J.Kobiak W.Stachurski, *Konstrukcje żelbetowe*, t.3, Arkady, Warszawa 1989<br>2. J.Kobiak W.Stachurski, *Konstrukcje żelbetowe*, t.4, Arkady, Warszawa 1991<br>3. K.Grabiec, *Żelbetowe konstrukcje cienkościenne*, Wydawnictwo Naukowe PWN, Warszawa 1999<br>4. A.Halicka D.Franczak, *Projektowanie zbiorników żelbetowych*, t.2, Wydawnictwo Naukowe PWN, Warszawa 2013 | |
| | Supplementary literature | 5. C.Kłoś A.Mitzel J.Suwalski, *Zbiorniki na ciecze*, Arkady, Warszawa 1961<br>6. A.Stachowicz W.Ziobroń, *Podziemne zbiorniki wodociągowe*, Arkady, Warszawa 1986<br>7. K.Girkmann, *Dźwigary powierzchniowe,* Arkady, Warszawa 1957<br>8. H.Lundgren, *Powłoki walcowe*, Arkady, Warszawa 1963<br>9. W.Flügge, *Powłoki,* Arkady, Warszawa 1972 | |
| | eResources addresses | Adresy na platformie eNauczanie: | |
| Example issues/ example questions/ tasks being completed | | | |
| Work placement | Not applicable | | |

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