GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

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|---|---|---|---|
| Subject name and code | Complex steel structures, PG_00041057 | | |
| 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 | English |
| Semester of study | 1 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Metal Structures -> Faculty of Civil and Environmental Engineering | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Aleksander Perliński | |
| | 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**

Knowledge and abilities upgrade connected with analysis and design of complex steel structures. Introduction to rules and methods related to fabrication, assembly and strengthening of steel structures.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmetal impact of investment realisation | Knows and uses codes form Eurocode 3 series, in particular Parts: 1-1, 1-5 and 1-8 | [SW3] Assessment of knowledge contained in written work and projects |
| [K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry construtions and its details | Can design steel floor beam, section class 4 plate girder and battened build-up column. | [SU3] Assessment of ability to use knowledge gained from the subject<br>[SU1] Assessment of task fulfilment |
| [K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements | Knows principles of design related to steel tall buildings, complex lattice structures, steel shell structures, masts, towers and chimneys. Knows methods of fabrication and assembly of metal structures. Knows principles of steel structure strengthening. | [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 | Knows principles of steel structures stability analysis using computer methods | [SW1] Assessment of factual knowledge |

<table>
<tr><td>Subject contents</td><td>Lectures: Plate girders and elements in section class 4. Multi-storey steel frame buildings. Structural lattices. Trusses of tubular sections. Advanced stability of steel structures. Masts, towers and chimneys. Dynamics and fatigue of steel structures. Steel shell structures. Structures of aluminium alloys. Manufacturing of steel structures. Assembly of steel structures. Refurbishment and strengthening of steel structures<br><br>Tutorials and project: Design of a steel floor beam. Design of a plate girder in section class 4. Design of a steel built-up column.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>written tutorial test</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>written lecture test</td><td>60.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. PN-EN 1993-1-1 Eurocode 3: Design of steel structures. Part 1-1: General rules and rules for buildings<br><br>2. PN-EN 1993-1-5 Eurocode 3: Design of steel structures. Part 1-8: Plated structural elements<br><br>3. PN-EN 1993-1-8 Eurocode 3: Design of steel structures. Part 1-8: Design of joints<br><br>4. Beg D. et al. Design of plated structures, ECCS, Ernst und Sohn, Berlin 2010<br><br>5. Kozłowski A. et al. Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część druga. Stropy i pomosty, Oficyna Wydawnicza PRz, Rzeszów 2011<br><br>6. Group of Authors: Budownictwo ogólne. Tom 5, Arkady, Warszawa 2010<br><br>7. Ziółko J.: Zbiorniki metalowe na gazy i ciecze, Wydawnictwo Arkady, Warszawa 1986<br><br>8. Ziółko J., Orlik G.: Montaż konstrukcji stalowych, Wydawnictwo Arkady, Warszawa 1980<br><br>9. Łubiński M., Żółtowski W.: Konstrukcje metalowe. Cześć II, Wydawnictwo Arkady, Warszawa 2007</td></tr>
<tr><td>Supplementary literature</td><td>1. Kozłowski A. et al. Konstrukcje stalowe. Przykłady obliczeń według PN-EN 1993-1. Część pierwsza. Wybrane elementy i połaczenia, Oficyna Wydawnicza PRz, Rzeszów 2009<br><br>2. Łubiński M., Filipowicz A., Żółtowski W.: Konstrukcje metalowe. Cześć I, Wydawnictwo Arkady, Warszawa 2000</td></tr>
<tr><td>eResources addresses</td><td>Adresy na platformie eNauczanie:</td></tr>
</table>
</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Design of plate girder in section class 4 with transverse stiffeners.<br><br>Design of axially compressed buttened built-up column consisting of two channel chords.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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