



Subject card

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|---|---|---|-------------------------------------|------------|---|---------|-----|
| Subject name and code | Engineering design, PG_00061900 | | | | | | |
| Field of study | Materials Engineering | | | | | | |
| Date of commencement of studies | October 2023 | Academic year of realisation of subject | | | 2023/2024 | | |
| Education level | first-cycle studies | Subject group | | | Obligatory subject group 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 | 2 | ECTS credits | | | 5.0 | | |
| Learning profile | general academic profile | Assessment form | | | assessment | | |
| Conducting unit | Department of Polymers Technology -> Faculty of Chemistry | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr inż. Marcin Włoch | | | | | |
| | Teachers | dr inż. Marcin Włoch Przemysław Gnatowski | | | | | |
| Lesson types and methods of instruction | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 15.0 | 30.0 | 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 | | 60.0 | 125 | |
| Subject objectives | Obtaining basic knowledge in the field of engineering design, including engineering calculations and engineering graphics | | | | | | |
| Learning outcomes | Course outcome | Subject outcome | | | Method of verification | | |
| | [K6_W05] Has the knowledge of mechanics, technology and electrical engineering, including engineering graphics and using computer aid, the use of databases in the design of technological processes. | Student understands the essence and complexity of engineering design, including the ability to analyze the problem, perform strength analysis and prepare a technical drawing | | | [SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge | | |
| | [K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others. | Student has the ability to solve basic problems related to engineering design, including simple tasks related to technical drawing and engineering calculations. | | | [SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work | | |
| | [K6_W03] Has knowledge of materials science and can relate the properties of materials with their structure and composition, knows the theoretical description of phenomena occurring in materials subjected to external factors. | Student is able to indicate materials that could be used in a given engineering application taking into account presented requirements | | | [SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge | | |
| | [K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes. | Student has the ability to analyze basic issues related to the strength of materials and technical drawing, in terms of theory and solving simple tasks and practical problems. | | | [SU4] Assessment of ability to use methods and tools [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment | | |

| Subject contents | <p>LECTURE / TUTORIAL:</p> <ol style="list-style-type: none"> 1. Designing processes, objects and materials as a basic element of engineering activities 2. Engineering design methods and techniques (problem formulation and analysis, methods of evaluation and selection of solutions) 3. Strength characteristics (introduction to mechanics and strength of materials; stresses, strains and strength criteria; strength calculations) 4. Technical drawing (principles of preparation and types of technical drawings; projection; views, sections and drawing layouts; principles of dimensioning; tolerances and fits; roughness) 5. Drawing selected structures (elements of machines and devices, including drive elements; detachable and inseparable connections) <p>PROJECT:</p> <ol style="list-style-type: none"> 1. Selected elements of pressure vessel design 2. Drawing design (execution design) of an element made using 3D printing technology | | | | | | | | | | | | | | | | | |
|--|--|--|--|--------------------------|-------------------|-------------------------------|--|--------|-------|------------------------------------|-------|-------|------------------------|-------|-------|--|--------|-------|
| Prerequisites and co-requisites | Knowledge from the course "Fundamentals of materials engineering" | | | | | | | | | | | | | | | | | |
| Assessment methods and criteria | <table border="1"> <thead> <tr> <th data-bbox="456 1055 794 1081">Subject passing criteria</th> <th data-bbox="799 1055 1137 1081">Passing threshold</th> <th data-bbox="1142 1055 1469 1081">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="456 1088 794 1162">Engineering design tasks (engineering calculations, 3D printing project)</td> <td data-bbox="799 1088 1137 1162">100.0%</td> <td data-bbox="1142 1088 1469 1162">25.0%</td> </tr> <tr> <td data-bbox="456 1169 794 1196">Engineering calculations colloquia</td> <td data-bbox="799 1169 1137 1196">50.0%</td> <td data-bbox="1142 1169 1469 1196">25.0%</td> </tr> <tr> <td data-bbox="456 1202 794 1229">Theoretical colloquium</td> <td data-bbox="799 1202 1137 1229">50.0%</td> <td data-bbox="1142 1202 1469 1229">25.0%</td> </tr> <tr> <td data-bbox="456 1236 794 1285">Engineering graphics tasks (technical drawing)</td> <td data-bbox="799 1236 1137 1285">100.0%</td> <td data-bbox="1142 1236 1469 1285">25.0%</td> </tr> </tbody> </table> | | | Subject passing criteria | Passing threshold | Percentage of the final grade | Engineering design tasks (engineering calculations, 3D printing project) | 100.0% | 25.0% | Engineering calculations colloquia | 50.0% | 25.0% | Theoretical colloquium | 50.0% | 25.0% | Engineering graphics tasks (technical drawing) | 100.0% | 25.0% |
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| Engineering graphics tasks (technical drawing) | 100.0% | 25.0% | | | | | | | | | | | | | | | | |
| Recommended reading | Basic literature | <p>P. Gendarz, S. Salamon, P. Chwastyk: Projektowanie inżynierskie i grafika inżynierska, PWE, Warszawa 2014</p> <p>W.M. Lewandowski, M. Ryms: Maszynoznawstwo chemiczne: podstawy wytrzymałości i przykłady obliczeń, PWN, Warszawa 2017</p> <p>T. Dobrzański: Rysunek techniczny maszynowy, PWN, Warszawa 2021</p> | | | | | | | | | | | | | | | | |
| | Supplementary literature | <p>M.E. Niezgodziński, T. Niezgodziński: Wzory, wykresy i tablice wytrzymałościowe, PWN/WNT, Warszawa 2022</p> <p>M.E. Niezgodziński, T. Niezgodziński: Zadania z wytrzymałości materiałów, PWN/WNT, Warszawa 2022</p> | | | | | | | | | | | | | | | | |
| | eResources addresses | <p>Adresy na platformie eNauczanie:</p> <p>Projektowanie inżynierskie (PG_00061900) - Moodle ID: 35376 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=35376</p> | | | | | | | | | | | | | | | | |
| Example issues/ example questions/ tasks being completed | | | | | | | | | | | | | | | | | | |
| Work placement | Not applicable | | | | | | | | | | | | | | | | | |