



Subject card

Subject name and code	Engineering design, PG_00061900						
Field of study	Materials Engineering						
Date of commencement of studies	October 2024	Academic year of realisation of subject			2024/2025		
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 Polymer Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Marcin Włoch					
	Teachers	dr inż. Marcin Włoch mgr inż. Przemysław Gnatowski dr inż. Ewa Głowińska					
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_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		
	[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		

Subject contents	<p>1. Designing processes, objects and materials as a basic element of engineering activities</p> <p>2. Engineering design methods and techniques (problem formulation and analysis, methods of evaluation and selection of solutions)</p> <p>3. Strength characteristics (introduction to mechanics and strength of materials; stresses, strains and strength criteria; strength calculations)</p> <p>4. Technical drawing (principles of preparation and types of technical drawings; projection; views, sections and drawing layouts; principles of dimensioning; tolerances and fits; roughness)</p> <p>5. Recording selected structures (elements of machines and devices, including drive elements; detachable and inseparable connections)</p>																	
Prerequisites and co-requisites	Knowledge from the course "Fundamentals of materials engineering"																	
Assessment methods and criteria	<table border="1" data-bbox="448 808 1487 1003"> <thead> <tr> <th data-bbox="448 808 794 842">Subject passing criteria</th> <th data-bbox="794 808 1141 842">Passing threshold</th> <th data-bbox="1141 808 1487 842">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 842 794 898">Exercise tests (engineering calculations)</td> <td data-bbox="794 842 1141 898">50.0%</td> <td data-bbox="1141 842 1487 898">30.0%</td> </tr> <tr> <td data-bbox="448 898 794 931">Drawing tasks</td> <td data-bbox="794 898 1141 931">50.0%</td> <td data-bbox="1141 898 1487 931">30.0%</td> </tr> <tr> <td data-bbox="448 931 794 965">Lecture test</td> <td data-bbox="794 931 1141 965">50.0%</td> <td data-bbox="1141 931 1487 965">10.0%</td> </tr> <tr> <td data-bbox="448 965 794 1003">Project tasks</td> <td data-bbox="794 965 1141 1003">50.0%</td> <td data-bbox="1141 965 1487 1003">30.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Exercise tests (engineering calculations)	50.0%	30.0%	Drawing tasks	50.0%	30.0%	Lecture test	50.0%	10.0%	Project tasks	50.0%	30.0%
Subject passing criteria	Passing threshold	Percentage of the final grade																
Exercise tests (engineering calculations)	50.0%	30.0%																
Drawing tasks	50.0%	30.0%																
Lecture test	50.0%	10.0%																
Project tasks	50.0%	30.0%																
Recommended reading	<table border="1" data-bbox="448 1010 1487 1626"> <tbody> <tr> <td data-bbox="448 1010 794 1294">Basic literature</td> <td colspan="2" data-bbox="794 1010 1487 1294"> <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> </td> </tr> <tr> <td data-bbox="448 1301 794 1503">Supplementary literature</td> <td colspan="2" data-bbox="794 1301 1487 1503"> <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> </td> </tr> <tr> <td data-bbox="448 1509 794 1626">eResources addresses</td> <td colspan="2" data-bbox="794 1509 1487 1626"> <p>Adresy na platformie eNauczanie:</p> <p>Projektowanie inżynierskie (PG_00061900) - WYKŁAD / ĆWICZENIA / PROJEKT - 2024/2025 - Moodle ID: 44109</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44109">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44109</a></p> </td> </tr> </tbody> </table>			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) - WYKŁAD / ĆWICZENIA / PROJEKT - 2024/2025 - Moodle ID: 44109</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44109">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44109</a></p>							
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) - WYKŁAD / ĆWICZENIA / PROJEKT - 2024/2025 - Moodle ID: 44109</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44109">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=44109</a></p>																	
Example issues/ example questions/ tasks being completed	<ul data-bbox="448 1632 1487 1928" style="list-style-type: none"> <li>• Projection and dimensioning of objects</li> <li>• Construction of chemical reactors</li> <li>• Types and fabrication technologies of joints</li> <li>• Methods of representing detachable and non-detachable joints</li> <li>• Strength of engineering materials and basic strength calculations</li> <li>• Tensile stresses in cylindrical vessels</li> <li>• Tensile, shear, and compressive stresses in joints</li> <li>• Design calculations for a cylindrical vessel</li> <li>• Design of an element and its 3D printing</li> </ul>																	
Work placement	Not applicable																	

Document generated electronically. Does not require a seal or signature.