



Subject card

Subject name and code	Strength of Materials I, PG_00050279						
Field of study	Mechanical Engineering, Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2021/2022		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study 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	2	Language of instruction			English not concerned		
Semester of study	3	ECTS credits			5.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Mechanics and Mechatronics -> Faculty of Mechanical Engineering and Ship Technology						
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Wiktoria Wojnicz					
	Teachers	mgr inż. Grzegorz Banaszek dr hab. inż. Wiktoria Wojnicz					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
	Adresy na platformie eNauczanie: Strength of Materials I, DAPE, PG_00050279, 2021-2022 - Moodle ID: 18575 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18575 Strength of Materials I, DAPE, PG_00050279, 2021-2022 - Moodle ID: 18575 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18575						
	Additional information: Lectures - remote Tutorials - remote and GUT						
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	8.0	57.0	125		
Subject objectives	The aim of the subject is to present the fundamentals of strength of materials and methods used to conduct strength of materials calculations						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	K6_W05	The student can design the simple mechanical systems and conduct mechanical analysis of these systems	[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
	K6_U06	The student can analysis a behaviour of mechanical systems	[SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment
	K6_U01	A student can use methods strength of materials methods to solve engineering problems	[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment [SU5] Assessment of ability to present the results of task [SU2] Assessment of ability to analyse information

Subject contents	<p>Lectures</p> <ol style="list-style-type: none"> 1. Fundamentals of Strength of Materials. Area moments of inertia. 2. Axial load: statically determinate problems of bars and systems of bars. 3. Axial load: statically indeterminate problems of bars and systems of bars. Thermal stress and mounting stress. 4. Torsion load: statically determinate problems of shafts, driving shafts, statically indeterminate problems shafts. 5. Bending of beams: determination of shear forces and bending moments. 6. Deflection of beam (method of initial parameters (Clebschs method)). Statically determinate problems and statically indeterminate problems. 7. Determination of internal forces in planar frames. 8. Planar state of stress. Mohrs circle of planar state of stress. <p>Tutorials</p> <ol style="list-style-type: none"> 1. Area moments of inertia. 2. Axial load: statically determinate problems of bars and systems of bars. Axial load: statically indeterminate problems of bars and systems of bars. 3. Torsion load: statically determinate problems of shafts and statically indeterminate problems of shafts. 4. Bending of beams: determination of shear forces and bending moments. 5. Deflection of beam (method of initial parameters (Clebschs method)). Statically determinate problems and statically indeterminate problems. 6. Determination of geometrical parameters of axial loaded bars (systems of bars), torsion loaded shafts and driving shafts, beams (normal and shear stresses). 7. Planar state of stress. Mohrs circle of planar state of stress. 8. Test 1 9. Test 2 10. Repeat test 											
	<p>Prerequisites and co-requisites</p> <p>Knowledge form the Mechanics (Theoretical Mechanics) field</p>											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th data-bbox="453 1966 794 2000">Subject passing criteria</th> <th data-bbox="799 1966 1141 2000">Passing threshold</th> <th data-bbox="1145 1966 1485 2000">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="453 2007 794 2040">tutorials' tests passing</td> <td data-bbox="799 2007 1141 2040">56.0%</td> <td data-bbox="1145 2007 1485 2040">50.0%</td> </tr> <tr> <td data-bbox="453 2047 794 2080">lectures' test passing</td> <td data-bbox="799 2047 1141 2080">56.0%</td> <td data-bbox="1145 2047 1485 2080">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	tutorials' tests passing	56.0%	50.0%	lectures' test passing	56.0%	50.0%
	Subject passing criteria	Passing threshold	Percentage of the final grade									
	tutorials' tests passing	56.0%	50.0%									
lectures' test passing	56.0%	50.0%										
Subject passing criteria	Passing threshold	Percentage of the final grade										
tutorials' tests passing	56.0%	50.0%										
lectures' test passing	56.0%	50.0%										

Recommended reading	Basic literature	<ol style="list-style-type: none"> 1. Muvdi B.B., McNabb J.W.: Engineering Mechanics of Materials. Third edition. Springer-Verlag 1991. 2. Da Silva, Vitor Dias: Mechanics and Strength of Materials. Springer 2006. 3. Timoshenko S.: Strength of Materials. Part I. Elementary Theory and Problems. USA 1940. 4. Timoshenko S.: Strength of Materials. Part II. Advanced Theory and Problems. USA 1940.
	Supplementary literature	Literature from the "Strength of Materials" field
	eResources addresses	<p>Strength of Materials I, DAPE, PG_00050279, 2021-2022 - Moodle ID: 18575 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18575</p> <p>Strength of Materials I, DAPE, PG_00050279, 2021-2022 - Moodle ID: 18575 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18575</p>
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> 1. Analysis a behaviour of the given mechanical system 2. Determine internal forces in the beam constrained and subjected to the application of one concentrated force and load with linear intensity distribution 	
Work placement	Not applicable	