GDAŃSK UNIVERSITY OF TECHNOLOGY

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

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, C, DaPE, sem. 03, zimowy 21/22,(PG_00050279) - Moodle ID: 18698
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=18698

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	**Lectures** 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. **Tutorials** 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
Prerequisites and co-requisites	Knowledge form the Mechanics (Theoretical Mechanics) field
Assessment methods and criteria	

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	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	
Example issues/ example questions/ tasks being completed	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	