GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Strength of Materials II, PG_00050281		
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	4	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Institute of Mechanics and Machine Design -> 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	15.0	15.0	0.0	0.0	60

E-learning hours included: 0.0

Strength of Materials II,Lectures,DAPE,spring 21-22 (PG_00050281) - Moodle ID: 21666
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=21666

Strength of Materials II, Tutorial and Laboratory, DaPE, sem. 04, summer 21/22, (PG_00050281) - Moodle ID: 22850
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22850

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 acquire knowledge to conduct engineering calculation of systems under the complex load

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U06	A student can formulate a mathematical model that considers mechanical loading and thermal influence, apply engineering tools to solve this engineering problem	[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
K6_U01	A student can formulate the engineering problem for the given system subjected to the load, solve this problem and explain obtained results	[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_W05	A student can formulate an engineering problem for the given mechanical construction and solve this problem by applying energetic methods and failure criteria	[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge

Subject contents	**Lectures (30h, Wiktoria Wojnicz)** Energy theorems: Clapeyrons theorem, Bettis theorem, Maxwells theorem (Maxwell-Mohrs method), Castigliano theorem, Menabreas theorem (Menabrea-Castiglianos method). Complex loading problems. Frames: Force method. Unsymmetric beam bending. Axial and flexural stresses. Curved beams. Curved bars Pressure vessels. Thin walled structure. Thick walled structure Bending of circular plates loaded symmetrically with respect to the centre **Tutorials (15h, Grzegorz Banaszek)** Beams and frames: Maxwells theorem (Maxwell-Mohrs method) and Castigliano theorem. Frames: Menabrea-Castiglianos method. Frames: Force method. Unsymmetric beam bending. Axial and flexural stresses. Curved beams. Curved bars Pressure vessels. Thin walled structure. Thick walled structure Test 1 Test 2 Repeat Test **Laboratory (15h, Grzegorz Banaszek)** Tensile static test. Compressive static test. Impact test.

	Torsion test. Fatigue test. Test Repeat Test
Prerequisites and co-requisites	Knowledge of the Mechanics (Theoretical Mechanics) and Strength of Materials I
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
lectures' test passing	56.0%	50.0%
tutorials' tests passing	56.0%	30.0%
laboratory's test passing	56.0%	20.0%

Recommended reading	Basic literature	1. Hibbeler R.C. Mechanics of materials,8th edition, Pearson Prentice Hall, USA, 2011 2. Muvdi B.B., McNabb J.W.: Engineering Mechanics of Materials. Third edition. Springer-Verlag 1991. 3. Da Silva, Vitor Dias: Mechanics and Strength of Materials. Springer 2006. 4. Timoshenko S.: Strength of Materials. Part I. Elementary Theory and Problems. USA 1940. 5. Timoshenko S.: Strength of Materials. Part II. Advanced Theory and Problems. USA 1940.
	Supplementary literature	Literature from the "Strength of Materials"
	eResources addresses	
Example issues/ example questions/ tasks being completed	1.Analysis a behaviour of the given mechanical system composed of simple beam and curved beam connected by one hinge joint. 2. Determine equal stresses in the beam subjected to the influence of torque, bending moments, shear forces and normal forces.	
Work placement	Not applicable	