

COURSE DESCRIPTION CARD

Bialystok University of Technology										
Field of study	Civil Engineering							Degree level and programme type	Bachelor's degree Full time study	
Specialization/ diploma path	-							Study profile	academic	
Course name	Strength of materials							Course code	EN-B2S31023	
								Course type	obligatory	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	3	
	30		15	30				No. of ECTS credits	6	
Entry requirements	Theoretical mechanics									
Course objectives	Students become familiar with the mechanical properties of basic construction materials. Introduce to students methods of determining selected parameters of plane sections, identifying strength cases, analyzing stresses and deformations in bar structures. Students become familiar with the relationships between deformations and stresses, and designing of bar structures.									
Course content	<p><u>Lecture</u>: material parameters, geometric characteristics of plane sections; simple and complex strength cases - tensile and axial compression, pure and transverse bending, technical shear, torsion, eccentric compression / tensile, eccentric bending, shear bending; stress state, strain state, beam deflection, straight bar stability. Introduction to computer calculations. Presentation of static and dynamic measurement equipment.</p> <p><u>Project</u>: application of material parameters and geometric characteristics of plane sections; application of simple and complex strength cases – computational problems.</p> <p><u>Laboratory</u>: laboratory tests of mechanical properties of construction materials; illustration of the laws of mechanics using the physical models.</p>									
Teaching methods	Informative lecture, solving practical problems, discussion on the project, performing laboratory tests									
Assessment method	Lecture – written exam, project - discussion on the project, test, laboratory – reports, test									
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study		
LO1	Student has knowledge about f the strength of materials and the general principles of designing of building structures,							K_B1_W03		
LO2	Student knows the principles of analysis, modeling, designing of construction elements. Is able to define							K_B1_W05 K_B1_U06		

	computational models of structures and their elements for analytical and numerical analysis of structures, and carry out their analysis.	
L03	Student knows the physical and mechanical properties of materials used in construction and testing methods. He can make a choice and correctly use building materials.	K_B1_W01 K_B1_U05
L04	Student can critically assess his knowledge in the field of strength of materials.	K_B1_K01
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
L01	Lecture – written exam,	L
L02	Lecture – written exam, project – discussion and tests	L, P
L03	Lecture – written exam, project – discussion and tests, laboratory - reports, test	L, P, LC
L04	Lecture – written exam, project – discussion and tests	L,P
Student workload (in hours)		No. of hours
Calculation	lecture attendance	30
	participation in project, laboratory classes	45
	preparation for laboratory classes	15
	Laboratory reports, homework	25
	participation in student-teacher sessions related to the course	5
	Solving project tasks (including preparation of multimedia presentations)	30
	preparation for exam and participation in it	15
	Preparation for the project	15
	TOTAL:	180
Quantitative indicators		HOURS
Student workload – activities that require direct teacher participation		85
Student workload – practical activities		135
Basic references	1. Dyląg Z., Jakubowicz A., Orłoś Z.: Wytrzymałość materiałów, t.1 i t.2. 2. Grabowski J., Iwańczewska A.: Zbiór zadań z wytrzymałości materiałów. 3. Bandyszewski W, Ibiańska-Jarmoc D.: Wytrzymałość materiałów, przykłady obliczeń Część I., Wydawnictwo Politechniki Białostockiej, Białystok, 2008.	
Supplementary references	1. Jastrzębski P., Mutermilch J., Orłowski W.: Wytrzymałość materiałów, cz.1 i cz.2. 2. Aleksander J. M.: Strength of Materials, Vol. 1. 3. Bandyszewski W, Ibiańska-Jarmoc D.: Wytrzymałość materiałów, przykłady obliczeń Część II, Wydawnictwo Politechniki Białostockiej, Białystok, 2008.	
Organisational unit conducting the course	Department of Geotechnics and Structural Mechanics	Date of issuing the programme

Author of the programme	Phd. Eng. Tadeusz Chyży, Prof. BUT	7.02.2019
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L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar