

## COURSE DESCRIPTION CARD

Bialystok University of Technology										
<b>Field of study</b>	<b>Civil Engineering</b>							<b>Degree level and programme type</b>	Bachelor's degree	
<b>Specialization/ diploma path</b>	-							<b>Study profile</b>	academic profile	
<b>Course name</b>	<b>Strength of materials</b>							<b>Course code</b>	IS-FCEE-00001-1W	
								<b>Course type</b>	Erasmus	
<b>Forms and number of hours of tuition</b>	L	C	LC	P	SW	FW	S	<b>Semester</b>	winter	
	30		15	30				<b>No. of ECTS credits</b>	6	
<b>Entry requirements</b>	Theoretical mechanics									
<b>Course objectives</b>	Students become familiar with the mechanical properties of basic construction materials. Students can determine geometric characteristics of plane sections; identify strength cases, analyze stresses and deformations of bar elements. Students become familiar with the relationships between deformations and stresses.									
<b>Course content</b>	<p><u>Lecture</u>: Mechanical properties of materials, geometric characteristics of plane sections; simple and complex strength cases: axially loaded members, pure bending, shearing, torsion, eccentric compression / tension, complex bending and shearing, beam deflection and slope, column buckling.</p> <p><u>Project</u>: geometric characteristics of plane sections; application of simple and complex strength cases – computational problems; beam deflection and slope - 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>									
<b>Teaching methods</b>	Informative lecture, solving practical problems, discussion on the project, performing laboratory tests									
<b>Assessment method</b>	Lecture – written exam, project - discussion on the project, test, laboratory – reports, test									
<b>Symbol of learning outcome</b>	<b>Learning outcomes</b>							<b>Reference to the learning outcomes for the field of study</b>		
<b>LO1</b>	Student has knowledge about the strength of materials and the general principles of designing of building structures,							K_B1_W03		
<b>LO2</b>	Student knows simple and complex strength cases - the principles of analysis, modeling and designing of construction elements. Is able to define computational models of structures and their elements for analytical analysis of structures, and carry out analysis.							K_B1_W05 K_B1_U06		
<b>LO3</b>	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		
<b>LO4</b>	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	
LO1	Lecture – written exam,	L	
LO2	Lecture – written exam, project – discussion and tests	L, P	
LO3	Lecture – written exam, project – discussion and tests, laboratory - reports, test	L, P, LC	
LO4	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	
	<b>TOTAL:</b>		180
Quantitative indicators		HOURS	No. of ECTS credits
<b>Student workload – activities that require direct teacher participation</b>		85	2,8
<b>Student workload – practical activities</b>		135	5
<b>Basic references</b>	<ol style="list-style-type: none"> <li>1. BY R. Subramanian: Strength of materials, Oxford University Press, 2010.</li> <li>2. Vitor Dias da Silva: Mechanics and strength of materials, Springer-Verlag Berlin Heidelberg 2006.</li> <li>3. Surya N. Patnaik Dale A Hopkins; Surya Hopkins,Dale Patnaik,: Strength of materials, Burlington Butterworth-Heinemann, 2004.</li> </ol>		
<b>Supplementary references</b>	<ol style="list-style-type: none"> <li>1. Jastrzębski P., Mutermilch J., Orłowski W.: Wytrzymałość materiałów, cz.1 i cz.2.</li> <li>2. Aleksander J. M.: Strength of Materials, Vol. 1.</li> <li>3. Bandyszewski W, Ibiańska-Jarmoc D.: Wytrzymałość materiałów, przykłady obliczeń Część II, Wydawnictwo Politechniki Białostockiej, Białystok, 2008.</li> </ol>		
<b>Organisational unit conducting the course</b>	Department of Geotechnics and Structural Mechanics	<b>Date of issuing the programme</b>	
<b>Author of the programme</b>	<b>Phd. Eng. Joanna Krętowska</b>	8.03.2021	

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar