

COURSE DESCRIPTION CARD

Faculty of Civil Engineering and Environmental Sciences									
Field of study								Degree level and programme type	
Specialization/ diploma path								Study profile	Academic profile
Course name	Theoretical mechanics							Course code	IS-FCEE-00141S
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	30	30						No. of ECTS credits	5
Entry requirements	Mathematics, Physics								
Course objectives	Students become familiar with statics general notions and principles. Students can learn how identify statically determinate and over-rigid structures, can learn to create the equations of equilibrium and calculate reactions for beams and frames and determine forces in planar trusses, can draw internal forces diagrams for plane bar structures. Students become familiar with the way of determination the center of figure and solid.								
Course content	<p><u>Lecture:</u> Vectors algebra. Statics general notions and principles. Systems of forces. Types of bar structures. Determination of reactions in statically determinate beams and frames. Calculation of forces of truss members - Ritter's method and method of joints. Internal forces in statically determinate bar systems - equations of internal forces and their diagrams. Center of gravity. Friction phenomenon.</p> <p><u>Classes:</u> Vector algebra - computational examples. Constrains and its reactions. Types of bar structures - examples. Concurrent coplanar force system, theorem of three forces. Determination of reactions in statically determinate beams and frames. Calculation of forces of truss members using the Ritter method and method of joints. Internal forces diagrams for statically determinate beams and frames. Determining the center of gravity of plane figures.</p>								
Teaching methods	Informative lecture, problem lecture, classes.								
Assessment method	Lecture – written exam, classes - tests								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	Student has knowledge about the statics general notions and principles, the phenomenon of friction,							K_B1_W01 K_B1_W03	

LO2	Student can identify statically determinate and over rigid structures; Student has knowledge about the force systems, can write equilibrium equations and determine reactions in statically determinate bar structures,	K_B1_W01 K_B1_W03 K_B1_U06	
LO3	Student has knowledge about internal forces, can determine internal forces for statically determinate plane bar structures and draw diagrams. Student calculates forces in truss members.	K_B1_W03 K_B1_U06	
LO4	Student has knowledge about determining the centers of gravity of figures and solids and can determine it.	K_B1_W01 K_B1_U06	
LO5	Student can critically assess his knowledge in the field of theoretical mechanics.	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, classes – written tests	L, C	
LO3	Lecture – written exam, classes – written tests	L, C	
LO4	Lecture – written exam, classes – written tests	L, C	
LO5	Lecture – written exam, classes – written tests	L, C	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	30	
	participation in classes	30	
	preparation for classes and tests, homework	40	
	preparation for exam and participation in it (18h+2h)	20	
	participation in student-teacher sessions related to the course	5	
	TOTAL:		125
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		67	2.6
Student workload – practical activities		95	3.8
Basic references	<ol style="list-style-type: none"> Hibbeler Russell Charles: Engineering mechanics: statics, Hoboken, Pearson Education, 2017. Leyko Jerzy: Mechanika ogólna. T.1, Statyka i kinematyka, Warszawa: Wydaw. Naukowe PWN, 2012. Leyko Jerzy: Mechanika ogólna. T.2, Dynamika, Warszawa: Wydaw. Naukowe PWN, 2012. Dyląg Z., Jakubowicz A.: Orłós Z. Wytrzymałość materiałów T 1., WNT 2007. Bandyszewski W, Ibiańska-Jarmoc D.: Wytrzymałość materiałów, przykłady obliczeń Część I., Wydawnictwo Politechniki Białostockiej, Białystok, 2008. 		
Supplementary references	<ol style="list-style-type: none"> Misiak Jan: Mechanika ogólna. T.1, Statyka i kinematyka, Warszawa: Wydaw. WNT, 2013. Wilde P.: Wismur M., Mechanika teoretyczna, PWN, Warszawa 1984. Misiak Jan: Zadania z mechaniki ogólnej, cz.1, WNT, Warszawa 1993. 		

	4. 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	Joanna Krętowska, PhD, Eng.	8.03.2021

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