

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	Basics of building structure mechanics							Course code	IS-FCEE-00099-1W	
								Course type	Erasmus	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter	
	15			15				No. of ECTS credits	3	
Entry requirements	Theoretical Mechanics, Strength of Materials, Structural Mechanics									
Course objectives	To familiarize students with the methods of calculating building structures: arches, spatial frames, spatial trusses. To familiarize students with the methods of analysis of the aforementioned constructions using classical methods and matrix approach. Students acquire practical skills in the use of classical and matrix methods as well as the selection of effective solution methods and verification of calculations.									
Course content	Fundamentals of static analysis of determinate and indeterminate spatial structures, properties and behaviour of spatial structures, general relationships between forces and displacements, matrix formulation of the displacement method, analysis of 3-D frames by force and displacement method, 3-D trusses, arches.									
Teaching methods	Lecture, project									
Assessment method	Lecture – final written test; Project – project completion, project corrections, written test									
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study		
LO1	Student knows how to analyze arches							K_B1_W01, K_B1_W03		
LO2	Student knows the methods of solving spatial frame structures							K_B1_W01, K_B1_W03		
LO3	Student can determine the degrees of static and kinematic indeterminacy of frame spatial structures							K_B1_W01, K_B1_W03 K_B1_U06		
LO4	Student is able to calculate spatial structures using classical methods							K_B1_W01 K_B1_W03 K_B1_U06		

L05	Student knows the ways to verify solutions and is able to verify the solution made	K_B1_W03 K_B1_U06	
L06	Student is ready to critically assess knowledge when solving cognitive and practical problems in the field of mechanics of spatial building bar structures	K_B1_K01	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	written test, project completion and written test	L, P	
L02	written test	L	
L03	written test, project completion and written test	L, P	
L04	written test, project completion and written test	L, P	
L05	written test, project completion and written test	L, P	
L06	written test	L	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	15	
	participation in classes, working on projects	15	
	preparation for classes	20	
	preparation for and participation in test	20	
	participation in student-teacher sessions related to the course	5	
	TOTAL:	75	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		35	1,4
Student workload – practical activities		60	2,4
Basic references	<ol style="list-style-type: none"> 1. Karnovsky I.A., Lebed O.: Advanced methods of structural analysis, Springer, New York 2010. 2. Nagarajan P.: Matrix methods of structural analysis. CRC Press, 2019. 3. Kassimali A.: Structural Analysis. Cengage Learning, 2015. 4. McKenzie W.M.C.: Examples in structural analysis. 2nd Ed. CRC Press, 2014. 		
Supplementary references	<ol style="list-style-type: none"> 1. Papadrakakis, M., Sapountzakis E.: Matrix methods for advanced structural analysis, Butterworth-Heinemann, Elsevier Inc., 2018. 2. Godbole P.N., Sonparote R.S., Dhote S.U.: Matrix Methods of Structural Analysis, PHI Learning Priv. Ltd., 2014. 		
Organisational unit conducting the course	Department of Geotechnics and Structural Mechanics	Date of issuing the programme	
Author of the programme	Adam Walendziuk, PhD, Eng	12.03.2021	

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