

## 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	Structural mechanics							Course code	IS-FCEE-00003S
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	30	30		30				No. of ECTS credits	7
Entry requirements	Theoretical Mechanics, Strength of Materials								
Course objectives	Presentation of solving methods for statically determinate and indeterminate structures. Learning the calculation of the internal forces in the indeterminate structures using Force Method and Direct Displacement Method. Presentation of drawing the influence lines of internal forces, reactions and displacements in statically determinate and indeterminate structures. Learning the calculation of any cross-section internal forces and displacements using influence lines. Introduction to the stability of the structures								
Course content	Beam, frames and trusses statically determinate - internal forces, influence lines. Static analysis of statically indeterminate structures - Force Method, Direct Displacement Method. Influence lines of internal forces, reactions and displacements in statically indeterminate structures. Stability of the structure. Critical force.								
Teaching methods	lecture, classes, three projects								
Assessment method	lecture – two-part written exam (theory and exercises); classes – up to three tests; project – three project completion, correction during the lessons and final discussion								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	Student identifies and describes the behaviour of bar structures							K_B1_W03	
LO2	Student identifies and describes the static behaviour of the structure as well its stability							K_B1_W01 K_B1_W03	
LO3	Student solves simple and more complex structures using Force Method							K_B1_U06 K_B1_U07	
LO4	Student solves simple and more complex structures using Direct Displacement Method							K_B1_U06 K_B1_U07	
LO5	Student uses influence lines to define values of internal forces, reactions and displacement in statically determinate and indeterminate systems							K_B1_U06 K_B1_U07	
LO6	Student justify presented solution of the calculated structure							K_B1_K01 K_B1_K02	

Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	exam (theory and exercises)	L	
L02	exam (theory and exercises)	L	
L03	exam (exercises), classes (tests), project (project calculation and completion)	L, C, P	
L04	exam (exercises), classes (tests), project (project calculation and completion)	L, C, P	
L05	exam (exercises), classes (tests), project (project calculation and completion)	L, C, P	
L06	discussion of delivered projects	P	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	30h	
	participation in classes and projects	60h	
	participation in student-teacher sessions related to the classes/project	5h	
	working on projects	50h	
	preparation for and participation in exams	25h	
	preparation for and participation in tests	30h	
	<b>TOTAL:</b>	<b>200h</b>	
Quantitative indicators		HOURS	No. of ECTS credits
<b>Student workload – activities that require direct teacher participation</b>		98	4
<b>Student workload – practical activities</b>		170	6
<b>Basic references</b>	1. Karnovsky I., Lebed O.: Advanced Methods of Structural Analysis. Springer 2010. 2. Hibbeler R.C.: Structural Analysis. Eight Edition. Pearson Prentice Hall 2012. 3. Carpintieri A.: Structural mechanics: a unified approach. Taylor & Francis 1997 (digital version 2006)		
<b>Supplementary references</b>	1. Megson T.H.G.: Structural and Stress Analysis. Second Edition. Elsevier 2005. 2. Williams A.: Structural Analysis in Theory and Practice. Butterworth-Heinemann 2009. 3. Darkov A.V., Kuznecov V.I.: Structural Mechanics, Mir Publishers, Moscow, 1968.		
<b>Organisational unit conducting the course</b>	<b>Department of Geotechnics and Structural Mechanics</b>	<b>Date of issuing the programme</b>	
<b>Author of the programme</b>	<b>Dr inż. Michał Baszeń</b>	<b>09.03.2021</b>	

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