COURSE DESCRIPTION CARD

Bialystok University of Technology									
Field of study	**Civil Engineering**							**Degree level and programme type**	**Bachelor's degree, full time programme**
Specialization/ diploma path								**Study profile**	**academic**
Course name	**Basics of Structural Analysis**							**Course code**	**19284109H**
								Course type	**obligatory**
Forms and number of hours of tuition	**L**	**C**	**LC**	**P**	**SW**	**FW**	**S**	**Semester**	**5**
	16			**16**				**No. of ECTS credits**	**3**
Entry requirements	**Theoretical Mechanics, Strength of Materials**								
Course objectives	**Presentation of drawing the influence lines of internal forces, reactions and displacements in statically determinate and indeterminate structures. Envelope of internal stress. Stability of the structures. Buckling. Critical force. Introduction to the analysis of structure vibration**								
Course content	**Influence lines of internal forces in statically determinate structures. Influence lines of internal forces, reactions and displacements in statically indeterminate structures. Kinematic analysis of structures - recognition of structural instability. Buckling and loss of stability of the structure. Calculation of critical force.**								
Teaching methods	**lecture, projects**								
Assessment method	**lecture – two-part written exam (theory and exercises); project – six 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 structures using Direct Displacement Method to find critical force to avoid the loss of stability**								**K_B1_U06 K_B1_U07**
LO4	**Student uses influence lines to define values of internal forces, reactions and displacement**								**K_B1_U06 K_B1_U07**
LO5	**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
LO1	exam (theory and exercises)	L
LO2	exam (theory and exercises)	L
LO3	exam (exercises), project (project calculation and completion)	L, P
LO4	exam (exercises), project (project calculation and completion)	L, P
LO5	discussion of delivered projects	P

Student workload (in hours)		No. of hours
Calculation	lecture attendance	16h
	participation in classes and projects	16h
	participation in student-teacher sessions related to the classes/project	3h
	working on projects	20h
	preparation for and participation in exams	20h
	TOTAL:	75h

Quantitative indicators	HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation	40	1,5
Student workload – practical activities	59	2

Basic references	1. Karnovsky I., Lebed O.: Advanced Methods of Structural Analysis. Springer 2010. 2. Hibbeler R.C.: Structural Analysis. Eight Edition. Pearson Pretince Hall 2012. 3. Carpinteri A.: Structural mechanics: a unified approach. Taylor & Francis 1997 (digital version 2006)
Supplementary references	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.
Organisational unit conducting the course	**Department of Geotechnics and Structural Mechanics**
Author of the programme	**Dr inż. Michał Baszeń**

Organisational unit conducting the course	**Department of Geotechnics and Structural Mechanics**	**Date of issuing the programme**
Author of the programme	**Dr inż. Michał Baszeń**	**29.09.2022**

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

S – seminar