COURSE DESCRIPTION CARD

Bialystok University of Technology									
Field of study	**ARCHITECTURE**							**Level and form of study**	second cycle full-time studies
A group of module/specialty	common subject							**Education profile**	general academic
Course name	**Building structures – computer modeling 2**							**Course code**	**AUII 2022**
								Type of classes	**obligatory**

Forms of classes	**L**	**T**	**LC**	**P**	**SW**	**FW**	**S**	**Semester**	**2**
					30			**ECTS credits**	**2**

Introductory courses	-
Objectives of the course	Teaching modeling, simulation, analysis and optimal design using the finite element method of spatial bar, surface and hybrid structures with various functions, forms and scales.
Programme content	Basics of the finite element method for three-dimensional bar and surface structures. One- and two-dimensional modeling. Spectral analysis. Buckling analysis. Static analysis. Optimization of form and material. Nervi's naturally ribbed boards. Tall buildings with open and closed sections. Long-span coating coverings - Coons' battens.
Teaching methods	Computer simulation, subject exercises
Forms of crediting	Colloquium, semester work in the form of an analysis of a given structural system with a description of the results

Outcomes symbols	**Expected learning outcomes**	**Reference to learning outcomes defined for the field of study**
EU1	knows and understands the basics of the finite element method and the scope of its use in the preliminary design of structures as an architect	A2_W09, A2_U06
EU2	knows software for simulating structures using the finite element method	A2_U06, A2_K04
EU3	is able to model spatial structures	A2_U06, A2_K04
EU4	can analyze the results of simulations of spatial structures, indicating places at risk of deformation and prevent them	A2_W03
EU5	is able to carry out analyzes taking into account dynamic wind loads	A2_W03, A2_W09, A2_U10
EU6	is ready to present key architectural goals in the concept of the designed structure and consult with industry experts	A2_W09, A2_U10
Outcomes symbols	**Methods of verification of learning outcomes**	**Form of classes subject to verification**
EU1	Assessment in the form of colloquiums and semester work (analysis in the form of a form or multimedia presentation)	SW

EU2	Assessment in the form of colloquiums and semester work (analysis in the form of a form or multimedia presentation)	SW
EU3	Assessment in the form of colloquiums and semester work (analysis in the form of a form or multimedia presentation)	SW
EU4	Assessment in the form of colloquiums and semester work (analysis in the form of a form or multimedia presentation)	SW
EU5	Assessment in the form of colloquiums and semester work (analysis in the form of a form or multimedia presentation)	SW
EU6	Assessment in the form of colloquiums and semester work (analysis in the form of a form or multimedia presentation)	SW

Student's workload balance (in hours)		Hours
Calculation	participation in a specialist workshop	30
	preparation for colloquiums	5
	preparing an independent analysis	10
	participation in consultations	5
	TOTAL:	**50**

Quantitative indicators	HOURS	ECTS
Student workload related to classes requiring direct teacher involvement	35	1,4
Student workload related to practical classes	50	2

Basic reference literature	1.Sieczkowski J.M.: Podstawy komputerowego modelowanie konstrukcji budowlanych. Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław, 2001.	
Supplementary references	1. Akin J.E.: Finite element analysis concepts via SolidWorks. World Scientific, Singapore, 2010.	
Implementing unit	Katedra Projektowania Architektonicznego, Pracownia Technicznego Wspomagania Projektowania	**Program development date**
Program developed by	mgr inż. arch. Milena Wiercińska	20.12.2019