GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CAD. Integrated Architectural Design, PG_00056907
Field of study	Architecture

Date of commencement of studies	October 2022	Academic year of realisation of subject	2022/2023
Education level	second-cycle studies	Subject group	Optional subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	blended-learning
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment

Conducting unit	Department of Visual Techniques -> Faculty of Architecture

Name and surname of lecturer (lecturers)	Subject supervisor	mgr inż. arch. Kacper Radziszewski
	Teachers	

Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	45.0	0.0	0.0	45
	E-learning hours included: 25.0						

Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
	Number of study hours	45	6.0	24.0	75

Subject objectives	During the course, students learn the methods of saving a project in the form of an algorithm using visual programming. Laboratories discuss the basic terms and methods of data recording, processing, visualization and a review of selected algorithms used in architectural design.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K7_W02] knows and understands the rules of gathering information and their interpretation as a part of project concept preparation; detailed issues related to architecture and urban planning in the field of complex design problems solving	knows and understands the rules of gathering information and their interpretation as a part of project concept preparation	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U03] is able to prepare advanced graphic, written and oral presentation of own design concepts in the field of architecture and urban planning, meeting the requirements of a professional record appropriate for architectural and urban design	is able to prepare advanced graphic, written and oral presentation of own design concepts in the field of architecture and urban planning, meeting the requirements of a professional record appropriate for architectural and urban design	[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools

Subject contents	Classes on the design of facades with the use of computer programming. Classes using Rhinoceros + Grasshopper3d software. During the laboratory, students will work on the design of the curvilinear facade.
	
	Students in pairs or individually design the facade system, which will then be written in the form of an algorithm using Grasshopper3d. Each of the classes consists of two stages: introduction to a new issue in the software and the design part, during which students work on developing the algorithm. During the course, students will use additional grasshopper libraries such as LunchBox and Weaverbird.
	
	   introduction to the content of the course and getting to know the Rhinoceros software interface + exercise
	   introduction to Grasshopper3d software + exercise
	   2d algorithmic modeling (voronoi diagram)
	   3D algorithmic modeling (SANAA Pavilion)
	   3d algorithmic modeling (attractor)
	   3D modeling of rhinoceros surface and lunchbox accessory
	   3d modeling Grasshopper and Weaverbird add-on
	   own work on the concept of the facade and record the design in the form of algorithm steps
	   introduction to data visualization in Grasshopper3d
	   working in Grasshopper3d on advanced detail modeling (part 1)
	   working in Grasshopper3d on advanced detail modeling (part 2)
	   work at Grasshopper3d on visualization and data export methods
	   work in Grasshopper3d on the solution of the concept (online consultations during the classes) (alone or in pairs)
	   work at Grasshopper3d on the solution of the concept (online consultations during classes) (alone or in pairs)
	   work on presenting the project

Prerequisites and co-requisites	Knowledge of CAD software. Knowledge of 3d modeling in any software.

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	facade design	70.0%	40.0%
	laboratory reports	70.0%	60.0%

Recommended reading	Basic literature	AAD_Algorithms-Aided Design, Parametric Strategies Using Grasshopper,Author: Arturo Tedesch
		Bonenberg, Wojciech, Giedrowicz, Marcin, Radziszewski, Kacper. (2019). Współczesne projekowanie parametryczne w architekturze
		https://www.modelab.is/grasshopper-primer
		https://www.grasshopper3d.com/
	Supplementary literature	
		Architectural Geometry 1st Edition,by Helmut Pottmann, Bentley
	eResources addresses	Adresy na platformie eNauczanie:

Example issues/ example questions/ tasks being completed	parametric modeling of Voronoi 2d geometry SANAA Pavilion algorithmic modeling modeling of a curvilinear facade with the use of panels and structures
Work placement	Not applicable