GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CAD. Integrated Architectural Design, PG_00063844					
Field of study	Architecture					
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025	
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		at the university	
Year of study	1		Language of instruction		Polish	
Semester of study	2		ECTS credits		4.0	
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	mgr inż. arch. Kacper Radziszewski				

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: 0.0						

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	8.0	47.0	100

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_U01] is able to use the experience gained during studies to make a critical analysis of the conditions and formulate conclusions for design in a complicated, interdisciplinary context	is able to use the experience gained during studies to make a critical analysis of the conditions and formulate conclusions for design in a complicated, interdisciplinary context	[SU2] Assessment of ability to analyse information
	[K7_W03] knows and understands the history and theory of architecture as well as art, technology and humanities to the extent necessary for the proper performance of architectural designs; advanced issues related to architecture and urban planning useful for designing architectural objects and urban complexes in the social, cultural, natural, historical, economic, legal context and other non-technical conditions of engineering activities, integrating knowledge acquired during studies	knows and understands the advanced issues related to architecture and urban planning useful for designing architectural objects and urban complexes in the social, cultural, natural, historical, economic, legal context and other non-technical conditions of engineering activities, integrating knowledge acquired during studies	[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	[SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task

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	

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