GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	CAD. Integrated Architectural Design, PG_00060307			
Field of study	Architecture			
Date of commencement of studies	October 2023	Academic year of realisation of subject	2023/2024	
Education level	second-cycle studies	Subject group	Obligatory subject group in the field of study	
			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	1	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	mgr inż. arch. Szymon Kowalski		
		mgr inż. arch. Kacper Radziszewski		
		mgr inż. arch. Dariusz Cyparski		
		mgr inż. arch. Michał Malewczyk		

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	5.0	25.0	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_W07] has knowledge of the complexity of digital context of architectural design and visual representation of urban, architectural and cultural heritage objects	has knowledge of the complex digital context of architectural design and the visual representation of urban, architectural and cultural heritage objects	[SW3] Assessment of knowledge contained in written work and projects
	[K7_U06] is able to apply the practical and professional skills necessary for the process of designing, managing and curating the digital urban, architectural and heritage content and to produce high level digital presentation based on different media	is able to apply practical and professional skills necessary in the process of designing, managing and caring for digital urban, architectural and heritage content and to create high-level digital presentations based on various media	[SU1] Assessment of task fulfilment
	[K7_K06] is ready to respond to the current digital culture and the growing role of virtual reality and gamification in the field of the management of the urban environment, designing architectural objects, and the protection of cultural heritage	is ready to respond to contemporary digital culture and the growing role of virtual reality and gamification in the area of urban environment management, design of architectural facilities and protection of cultural heritage	[SK3] Assessment of ability to organize work
	[K7_K07] is aware of the challenges, opportunities and demands related to the application of the digital technologies in urban planning and architectural design	is aware of the challenges, opportunities and requirements related to the use of digital technologies in urban planning and architectural design	[SK5] Assessment of ability to solve problems that arise in practice

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	