

Subject card

Subject name and code	3D Animation, PG_00123540						
Field of study	Informatics						
Date of commencement of studies	October 2025		Academic year of realisation of subject		2025/2026		
Education level	Master's studies		Subject group		Obligatory subject group in the field of study Optional subject group		
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		6.0		
Learning profile	academic		Assessment form		exam		
Conducting unit							
Name and surname of lecturer (lecturers)	Subject supervisor		dr Piotr Arłukowicz				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		0.0		0.0	60
Subject objectives	The aim of the course is to teach students how to create computer animations in 3D. The basics of animation are covered, including Disneys 12 principles of animation, constraint systems, drivers, simulations, and shape animation methods combined with sound. Skeletal and procedural animations are discussed, as well as techniques for composing animations from simple individual actions. The course also includes a module on working with Motion Capture, where the application and use of character motion capture data are explored. Additionally, students learn how to render and edit films.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[INFMU2_U05] can apply known algorithms in specific situations, can effectively select the type of algorithm depending on the problem at hand		The student is able to create an animation in a style of their choice, using the techniques and methods covered in the course that are considered industry best practices.		[SU2] presentation/project/paper/report		
	[INFMU2_W01] has in-depth knowledge of the branches of mathematics necessary for the study of computer science; has a good understanding of the role and importance of the construction of mathematical reasoning		The student understands the principles of creating animations, including animations based on keyframes for various parameters as well as those obtained through simulations.		[SW2] presentation/project/paper/report		

Subject contents	We start the classes as usual with the basics: Review (or introduction) to 3D graphics and using Blender Animations based on keyframe systems, control of time, speed, and motion dynamics Animation exercises using circular, figure-eight, and spiral motions; animation of a ball falling down stairs Constraints and limitations, controlling motion through movement, transferring parameters between objects, creating dependent animations exercise: crankshaft motion as in steam locomotive wheels Drivers advanced control of dependent motion and modeling and animating a planetary gear system. For those interested, there is also an optional animation of Cardan joint motion Introduction to bone-based animation systems Disneys 12 principles of animation Motion modeling using Squash & Stretch ball animation, but this time with character Forward and inverse kinematics modeling hand movement with FK/IK systems, Custom Properties, and Drivers Optional: foot model and rig Full-body rig and Rigify, walk and run cycles NLA and composite animations made from actions animating a person walking a patrol path while performing simple additional actions (exercises, clapping, waving hands, etc.) Shape keys, lip-sync, and facial animation from now on models can talk, blink, and have facial expressions Introduction to Rigid Body simulations Optional: Soft Body simulations, deformations, elasticity, clothing, fabrics, flags, wind, etc. Optional: fluid simulations water, smoke, fire, explosions Optional: dynamic paint simulations dents, waves, trails, scratches, etc.		
Prerequisites and co-requisites	Basic computer skills. Completion of a prior 3D Graphics course or a similar one, and/or familiarity with 3D animation software packages, is highly recommended.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	project	51.0%	67.0%
	assignments	51.0%	33.0%
Recommended reading	Basic literature	Tony Millen: Introducing Character Animation with Blender, John Wiley & Sons, ISBN13 9780470427378, ISBN10 047042737X	
	Supplementary literature	Miguel Angel Manrique: Blender for Animation and Film-Based Production, Apple Academic Press Inc., EAN 9781482204742, ISBN 1482204746	
	eResources addresses	Basic https://polskikursblendera.pl - Polish Blender Course	
Example issues/ example questions/ tasks being completed	Animation of a rocket and a drone following it Animation of a person eating at a table Animation of a person falling into a hole Animations of text, solids, geometric transformations, etc. Animations of robots and machines at work		
Work placement	Not applicable		

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