

**FACULTY OF ENGINEERING
STUDY COURSE DESCRIPTION**

Course Title:	Geometry processing and visualization				
Course code (LAIS):	The course code will be specified after receiving the license				
Study programme:	Information Technologies				
Level of Study programme:	<input type="checkbox"/>	1st level professional higher education			
	<input type="checkbox"/>	Professional Bachelor			
	<input checked="" type="checkbox"/>	Professional Master			
	<input type="checkbox"/>	Academic Master			
	<input type="checkbox"/>	PhD level			
Type of Study programme:	<input checked="" type="checkbox"/>	Compulsory course (Part A)			
	<input type="checkbox"/>	Professional specialization courses (Part B, compulsory)			
	<input type="checkbox"/>	Professional specialization optional courses (Part B, optional)			
	<input type="checkbox"/>	Elective courses (Part C)			
Course Workload:	Credits	ECTS	Academic hours	Contact hours	Independent work hours
	2	3	80	24	56
Course Author/ Tutor:	Imants Zarembo				
	Dr.sc.ing.				
	imants.zarembo@va.lv				
	Consultation: by agreement				
Study Form:	Full time studies				
Study year, semester:	1 st year, 2 nd semester				
Language:	Latvian, English				
Prerequisites for the Course:	-				
Course Summary:	The aim of this course is to give practical and theoretical knowledge about geometry, trigonometry related to computer graphics, 2D and 3D graphics and objects, coordinate systems, projections, curves and rendering. Students will be able to improve their practical skills in computer graphics by completing practical activities.				
Assessment:	Examination				
Requirements for Credits:	1. Practical exercises completed and submitted				
	2. Final assessment completed				
	Final examination consists of oral questions. If all requirements are not met on time, student is not allowed to pass the exam. For delayed exam requirements, max score is decreased.				
Abiding by the Academic Ethics	Students must abide by the academic and research ethics, Vidzeme University of Applied Sciences Ethics Regulations, incl.:				
	<ul style="list-style-type: none"> – study papers must be independently developed; – the study work should reference all statements, ideas and data used that have been authored by someone else; – appropriate data acquisition methods should be used in the acquisition of data, the research ethics must be respected, empirical data must be collected independently and cannot be distorted or falsified; – the examination must be carried out by the student independently, without the use of supporting materials and/or consultations with other students, unless the lecturer states otherwise. 				
	In the event of non-compliance with the academic and research ethics, punishment is imposed in accordance with the ViA Ethics Regulations and the study course must be re-taken, unless the punishment is extramarital.				
Learning Outcomes; the evaluation methods and criteria	Learning Outcomes			The evaluation methods and criteria	
	Knowledge				
	Knowledge of mathematics that underlying computer graphics.			Submitted practical tasks.	
	Knowledge of 2D and 3D graphics principles and terminology.			Submitted practical tasks.	

	Knowledge of rendering principles.	Submitted practical tasks.
	Skills	
	Skill to apply mathematics and programming to visualize information.	Submitted practical tasks.
	Skill to work with elements of 2D and 3D graphics.	Submitted practical tasks.
	Skill to develop simple graphical applications.	Submitted practical tasks.
	Competency	
	Ability to use computer graphics terminology correctly.	Individual exam and presentation of completed practical tasks.
	Ability to use appropriate elements of 2D and 3D graphics to reach a specific goal.	Individual exam and presentation of completed practical tasks.
Course Compulsory literature:	<ol style="list-style-type: none"> 1. Colleen Macklin, John Sharp, Games, Design and Play: A detailed approach to iterative game design, June 13, 2016, 288 pages, Addison-Wesley Professional 2. Jesse Schell, Jesse Schell, The Art of Game Design: A Book of Lenses, Second Edition, November 6, 2014 by A K Peters/CRC Press 3. David Michael, Sande Chen, Serious Games: Games That Educate, Train, and Inform, October 10, 2005, 312 pages, Cengage Learning PTR 	
Course additional literature:	<ol style="list-style-type: none"> 1. Katie Salen Tekinbaş, Eric Zimmerman, Rules of Play: Game Design Fundamentals, September 25, 2003, 688 pages, The MIT Press 2. Tracy Fullerton, Game Design Workshop: A Playcentric Approach to Creating Innovative Games, March 7, 2014, 535 pages, A K Peters/CRC Press 	
Course confirmation date:	13.06.2018	
Date of course description update:		

Study Course Plan:

Date	Theme	Academic hours		Study Form/ Organization of independent work of students and task description
		Contact hours	Independent work hours	
<i>The date is specified before the implementation of the course</i>	Sprites, two-dimensional objects. Polygons, three-dimensional objects. Trigonometry and coordinate systems. Applied geometry and homogenous coordinates and transformations of space.	8	0	Theoretical lecture.
	Transformations, scaling, translation, rotation shearing, reflection and identity matrix. Shape description in 2D and 3D. Motion and visibility determination. Projections and the viewing pipeline.	8	0	Theoretical lecture.
	Curves, curve rendering, parametric curves and reparametrization, Bezier curves. Rendering, lighting, shaders, antialiasing.	8	0	Theoretical lecture.
	Completion of practical exercises.	0	56	Practical activity.
	Hours total:	24	56	