

**FACULTY OF ENGINEERING
STUDY COURSE DESCRIPTION**

Course Title:	Simulation Modelling and Data 3D Visualization				
Course code (LAIS):	DatZ6006				
Study programme:	Virtual Reality and Smart 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"/>	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:	Mairita Zaķe				
	Guest lecturer, Mg.sc.comp.				
	mairita.zake@va.lv				
	Consultation: according to the schedule for each semester				
Course Form:	Full time				
Study year, semester:	1 st year, 2 nd semester				
Language:	Latvian, English				
Prerequisites for the Course:	-				
Course Summary:	The course introduces to simulation modelling and data 3D visualization. It considers all three basic concepts of simulation and related software, as well as practical applications in different areas. The role of simulation as a problem-solving tool and as an approach to exploring system performance is emphasised. Usage of key statistical concepts, including input and output data analysis, verification, validation and experimental planning are introduced.				
Course Methods:	Lectures, practical activities, independent work, workshop for the defence of the course work				
Assessment:	Examination				
Requirements for Credits:	1. All three practical works require a positive evaluation (at least 4 out of 10). 2. The course work must be submitted and defended within the deadline and must be successfully evaluated.				
	If practical assignments are not submitted within the deadlines indicated by the lecturer, the student is not admitted to the defence of the course work and the maximum assessment that the student can qualify for completing the requirements is reduced. The final score is: 1. Evaluation for 1st practical work - 15%. 2. Evaluation for 2nd practical work - 15%. 3. Evaluation for 3rd practical work - 15%. 4. Evaluation for the course work - 40% 5. Evaluation for the defence of the course work - 15%				
Course Contents:	Overview and initiating of simulation modelling and data 3D visualization. Overview of simulation modelling types. Importance of simulation modelling and its representation in real world, its importance and tendencies.				
Learning Outcomes; the evaluation methods and criteria	Learning Outcomes			The evaluation methods and criteria	
	Knowledge				
	Knowledge of social systems simulation modelling.			Lectures, practical assignments.	

	Knowledge of simulation modelling types.	Lectures, practical assignments.
	Knowledge of simulation model tendencies.	Lectures, practical assignments.
	Knowledge of simulation modelling tools.	Lectures, practical assignments.
	Skills	
	Ability to represent social system in simulation model.	Lectures, practical assignments.
	Ability to analyse and use created simulation models.	Lectures, practical assignments.
	Ability to use 3D visualization of data	Lectures, practical assignments.
	Competency	
	Knowledge of social systems simulation modelling technologies.	Lectures, practical assignments.
	Knowledge of process how to make simulation model in different environments.	Lectures, practical assignments.
	Knowledge of social systems simulation modelling types.	Lectures, practical assignments.
Course Compulsory literature:	1. Grigoryev I., Borshchev A., AnyLogic 6 in Three Days: A Quick Course in Simulation Modeling, AnyLogic North America, 2012, ISBN 0615705677, 9780615705675 2. Borshchev A., The Big Book of Simulation Modeling: Multimethod Modeling with AnyLogic 6, AnyLogic North America, 2013, ISBN 0989573176, 9780989573177 3. N. Gilbert, K. G. Troitzsch., Simulation for the social Scientist., 2005., ISBN 0335216005	
Course additional literature:	1. Chang Cristopher. Simulation Modeling Handbook. A Practical Approach. CRC Press2004	
Course confirmation date:		
Date of course description update:		

Study Course Plan:

Date	Theme	Academic hours		Study Form
		Contact hours	Independent work hours	
<i>The date is specified before the implementation of the course</i>	Introduction to system simulation modelling, imitation modelling technologies, imitation modelling software and 3D data visualization, modelling examples and analysis of results	2	8	Lecture.
	Discrete event systems modelling	6	10	Lecture, first practical assignment.
	System dynamics based modelling	6	10	Lecture, second practical assignment.
	Agent-based imitation modelling	6	10	Lecture, third practical assignment.
	Defence of the course work	4	18	Development and defence of the course work
Hours total:		24	56	