

**FACULTY OF ENGINEERING  
STUDY COURSE DESCRIPTION**

<b>Course Title:</b>	<b>3D Modelling Approaches and Scripting</b>				
<b>Course code (LAIS):</b>	<b>DatZ1019</b>				
<b>Study programme:</b>	<b>VIRTUAL REALITY AND MOBILE TECHNOLOGIES</b>				
<b>Level of Study programme:</b>	<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				
<b>Type of Study programme:</b>	<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)				
<b>Course Workload:</b>	<b>Credits</b>	<b>ECTS</b>	<b>Academic hours</b>	<b>Contact hours</b>	<b>Independent work hours</b>
	2	3	80	24	56
<b>Course Author/ Tutor:</b>	<b>Lauris Taube</b>				
	Guest lecturer, Mg.sc.comp.				
	e-mail: lauris.taube@va.lv				
	Consultation: in agreement with the lecturer				
<b>Study Form:</b>	Full time studies				
<b>Study year, semester:</b>	1., 1 <sup>st</sup> semester				
<b>Language:</b>	Latvian, English				
<b>Prerequisites for the Course:</b>	-				
<b>Course Summary:</b>	The aim of this study is to provide a high level of knowledge and skills on the concepts of three-dimensional modelling, as well as higher-level modelling techniques. In addition, knowledge is provided in the design and creation of visual effects and their combination with real images and video footage, as well as the basic knowledge of scripting in Blender using Python programming language.				
<b>Assessment:</b>	Examination				
<b>Requirements for Credits:</b>	1. Passed each lecture's practical activity. 2. Independent work grade - accounts for 50% of the final score. 3. Examination grade - accounts for 50% of the final score.				
	<p>Final grade consists of grades from independent work and examination. The final assessment includes the development of a student chosen subject from the course.</p> <ul style="list-style-type: none"> <li>The submitted work will be evaluated in the 10-point system, taking into account the following criteria: <ul style="list-style-type: none"> <li>brilliant (10) - knowledge, skills and competences outweigh the knowledge gained during the course;</li> <li>excellent (9) - knowledge, skills and competences fully correspond to the knowledge to be acquired during the course;</li> <li>very good (8) - completely fulfilled the requirements of the task, however, some of its implementation nuances are not sufficiently deep understanding;</li> <li>well (7) - the requirements of the task are generally fulfilled, however, sometimes the inability to use the acquired knowledge to be used for the given task is revealed;</li> <li>almost well (6) - the requirements of the task are fulfilled, however, at the same time, an insufficiently deep understanding of the task and inability to use the acquired knowledge are detected;</li> <li>satisfactory (5) - the requirements of the task are fulfilled, however, there is insufficient knowledge of some skills in the task and inability to use the acquired knowledge;</li> </ul> </li> </ul>				

	<p>almost satisfactory (4) - poorly fulfilled task requirements, insufficient understanding of basic concepts is detected, there are significant difficulties in the practical use of the acquired knowledge;</p> <p>poor (3) - knowledge is superficial and incomplete, the student is not able to use it for a specific task;</p> <p>very weak (2) - superficial knowledge only about certain problems, most of the task requirement is not learned;</p> <p>very, very weak (1) - there is no understanding of the basic problem of the task, there is hardly any knowledge of the topics covered in the course.</p>	
<b>Abiding by the Academic Ethics</b>	<p>Students must abide by the academic and research ethics, Vidzeme University of Applied Sciences Ethics Regulations, incl.:</p> <ul style="list-style-type: none"> <li>– study papers must be independently developed;</li> <li>– the study work should reference all statements, ideas and data used that have been authored by someone else;</li> <li>– 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;</li> <li>– 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.</li> </ul> <p>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.</p>	
<b>Learning Outcomes; the evaluation methods and criteria</b>	<b>Learning Outcomes</b>	<b>The evaluation methods and criteria</b>
	<b>Knowledge</b>	
	Knowledge on 3D modelling methods and their applications.	Created practical work in lecture.
	Knowledge on the problems and errors while modelling.	Created practical work in lecture.
	Knowledge on integrating visual effects in images and video footage.	Created practical work in lecture.
	Knowledge on scripting in Blender.	Created practical work in lecture.
	<b>Skills</b>	
	Skills to create a 3D model using acquired knowledge and techniques.	Created independent work.
	Skills to integrate a 3D model and/or other visual effects in an image and postprocess the final image.	Created independent work.
	Skills to integrate a 3D model and/or other visual effects in video footage and postprocess the final image.	Created independent work.
	Skills to create a script that manipulates the 3D scene.	Created independent work.
	<b>Competency</b>	
	Use the correct modelling tools in creation of 3D models.	
	Independently debug and correct the errors made while modelling.	
Use available tools to create various visual effects and integrate them in an image or video footage.		
Independently create a Python script for use in Blender.		
<b>Course Compulsory literature:</b>	Chronister James, 2017, Blender Basics 5 <sup>th</sup> Edition Chris Conlan, 2017, The Blender Python API	
<b>Course additional literature:</b>	Ahearn Luke, 2016, 3D Game Textures 4 <sup>th</sup> Edition	

<b>Course confirmation date:</b>	<b>13.06.2018</b>
<b>Date of course description update:</b>	

### Study Course Plan:

Date	Theme	Academic hours		Study Form/ Organization of independent work of students and task description
		Contact hours	Independent work hours	
23.11.	Basic 3D modelling techniques and their applications. The most frequent problems and errors while modelling and their results. 3D model texturing. Modelling using NURBS curves and surfaces. Use of Blender modifiers for modelling. Procedural modelling using modifiers. Smoke and liquid simulations. Postprocessing rendered images in Blender software.	10	20	Theoretical lecture. Practical activity.
24.11.	3D data integration in photos. Video motion tracking and 3D data integration into video footage. Python scripting. Automation of processes. Create models in a script.	10	20	Theoretical lecture. Practical activity.
06.12.	Final examination	4	16	Exam.
<b>Hours total:</b>		<b>24</b>	<b>56</b>	