MODULE SPECIFICATION

Part 1: Information			
Module Title	Algorithmic Means of Computer Graphics [TSI]		
Module Code	UFCFKX-6-3	Level	Level 6
For implementation from	2023-24		
UWE Credit Rating	6	ECTS Credit Rating	3
Faculty	Faculty of Environment & Technology	Field	Computer Science and Creative Technologies
Department	FET Dept of Computer Sci & Creative Tech		
Module Type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co-requisites	None		
Module Entry Requirements	None		
PSRB Requirements	None		

Part 2: Description

Educational Aims: The aim of this module is to examine the basic algorithms used in a two- and three-dimensional (2D and 3D) vector graphics. To introduce theoretically and practically with the methods, algorithms, and special techniques of flat and three-dimensional (3D) graphical objects. To acquaint with graphics libraries such as OpenGL.

Outline Syllabus: Introduction to computer graphics;
Geometric information representation;
Geometric transformations;
Spatial scenes projecting;
Introduction to OpenGL;
Geometric transformations realisation in OpenGL;
Geometric primitives clipping;
Hidden surface and lines removal algorithms;
Colour in computer graphics;

Brushing. Rendering of polygonal models;
Lighting models and textures

Teaching and Learning Methods: Learning and teaching will be provided to students in two forms: lectures and labs. During lectures, theoretical aspects of the course will be provided to students by the teaching staff. Lectures will be supported by presentation published and available to the students on e.tsi.lv under the module section. Also, additional materials, like code examples, text books, publications on the internet, videos etc will be presented in e.tsi.lv. During labs, each student receives an individual task to perform.

C++ are considered as high-level programming language and OpenGL are considered as example of graphics API. In addition to learning activities during taught sessions, students are expected to spend time outside of class on independent learning activities. These might include completing assignment tasks, independent reading, practising new skills on personal projects and completing self-assessment test etc.

Part 3: Assessment

This module assessment is split into two components (A – Exam, B – Labs):

A - final 2-hour examination which will assess the students understanding of taught material that forms part of the learning outcomes but cannot easily be assessed through practical tasks.

B – a portfolio of practical tasks (labs), exploring basic principles of representation and transformation of 2D and 3D images at the algorithmic level using C++ programming language and OpenGL. An application and its source code should be provided to the teaching staff.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A	✓	40 %	Written Examination
Portfolio - Component B		60 %	A series of practical tasks (labs), exploring basic principles of representation and transformation of 2D and 3D images at the algorithmic level using C++ programming language and OpenGL. An application and its source code should be provided to the teaching staff.
Resit Components	**Final Assessment**	**Element weighting**	**Description**
Examination - Component A		40 %	Examination
Portfolio - Component B		60 %	series of 5 practical tasks (labs), exploring basic principles of representation and transformation of 2D and 3D images at the algorithmic level using C++ programming language and OpenGL. An application and its source code should be provided to the teaching staff.

Part 4: Teaching and Learning Methods

Learning Outcomes	On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Know main terms, concepts, and classification of computer graphics	MO1
Know different types of colour and lightening models	MO2
Know how to represent the geometric data and make geometric transformations	MO3
Construct two-dimensional and three-dimensional objects models	MO4
Know algorithms of processing vector images: clipping, removal of hidden lines and surfaces, brushing	MO5
Use of popular graphic libraries	MO6
Use of different lighting models of objects and scenes	MO7
Use modern programming environment Visual Studio, programming language C++ and OpenGL library for simple graphic scenes development	MO8

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	48
Total Independent Study Hours:	48
Scheduled Learning and Teaching Hours:	
Face-to-face learning	32
Total Scheduled Learning and Teaching Hours:	32
Hours to be allocated	60
Allocated Hours	80

Reading List

The reading list for this module can be accessed via the following link:

https://rl.talis.com/3/uwe/lists/761736B4-5C44-B7FD-EC0F-4688D3C2B8F9.html?lang=en-gb&login=1

Part 5: Contributes Towards

This module contributes towards the following programmes of study:

Computer Science and Software Development {Double Degree} [Oct][FT][TSI][4yrs] BSc (Hons) 2020-21

Computer Science and Software Development {Double Degree} [Oct][PT][TSI][5yrs] BSc (Hons) 2020-21 BSc (Hons) 2020-21

Computer Science and Software Development {Double Degree} [Feb][FT][TSI][4yrs] BSc (Hons) 2020-21

Computer Science and Software Development {Double Degree} [Feb][PT][TSI][5yrs] BSc (Hons) 2020-21 BSc (Hons) 2020-21