Module Specification

Computer Graphics [TSI]

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Part 1: Information

Module title: Computer Graphics [TSI]

Module code: UFCE7A-12-3

Level: Level 6

For implementation from: 2023-24

UWE credit rating: 12

ECTS credit rating: 6

College: College of Arts, Technology and Environment

School: CATE School of Computing and Creative Technologies

Partner institutions: Transport and Telecommunication Institute

Field: Computer Science and Creative Technologies

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module provides an introduction to computer graphics.

Features: Not applicable

Educational aims: Formation of students' professional competencies related to the use of mathematical and algorithmic foundations of computer graphics, technologies for the formation and processing of graphic images; obtaining practical skills in the

use of computer graphics algorithms and graphics libraries in the development of applications.

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

Part 3: Teaching and learning methods

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.

High-level programming languages 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.

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

MO1 Knowledge and understanding of the terms, concepts and classifications and algorithms to implement and optimise graphical operations effectively.

MO2 Think analytically and logically about the steps and computations necessary to generate 2D images and 3D scenes.

MO3 Utilise computer graphics tools (programming language, APIs, graphical libraries, and frameworks) to create 2D and 3D images. Evaluating the power and capabilities of these tools.

MO4 Evaluate and apply different techniques for representing two and three dimensional geometrical objects

Hours to be allocated: 120

Contact hours:

Independent study/self-guided study = 96 hours

Face-to-face learning = 64 hours

Total = 160

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://rl.talis.com/3/uwe/lists/761736B4-5C44-B7FD-EC0F-4688D3C2B8F9.html?lang=en-gb&login=1

Part 4: Assessment

Assessment strategy: To assess the learning outcomes of this course, several types of activities are provided, which include:
1) performing practical work (summative assessment)
2) examination (summative assessment).

Laboratory work is carried out by students independently. The main task is the acquisition of practical skills and the application of theoretical knowledge gained during the classes. Based on the results of the implementation, a report is prepared, which is evaluated by the teacher using grading scale. In addition to the assessment, the student receives feedback on the work done.

Automated tests are used as a formative type of knowledge assessment and are designed for continuous self-assessment of the knowledge acquired by the student. This will allow students to pay attention to material that they have not mastered enough.

The course ends with an exam, which is aimed at assessing the theoretical knowledge and practical skills acquired by the student in the process of studying the course.

Resits for a practical skills assessment will be a single task. Examination will be like for like.

Assessment tasks:

Practical Skills Assessment (First Sit)
Description: A series of practical tasks (labs), exploring and applying principles of representation and transformation of 2D and 3D images at the algorithmic level using high-level programming language and OpenGL. Application(s) and source code should be provided.
Weighting: 60 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3, MO4

Examination (First Sit)
Description: Written Examination (2 hours)
Weighting: 40 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO4

Practical Skills Assessment (Resit)

Description: A single tasks which covers all skill assessed during the previous assessments.
Weighting: 60 %
Final assessment: No
Group work: No
Learning outcomes tested: MO2, MO3, MO4

Examination (Resit)
Description: Written Examination (2 hours)
Weighting: 40 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

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

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