Computer graphics - course description

General information

Course name	Computer graphics
Course ID	11.3-WE-INFP-GrafComp-Er
Faculty	Faculty of Computer Science, Electrical Engineering and Automatics
Field of study	Computer Science
Education profile	academic
Level of studies	First-cycle Erasmus programme
Beginning semester	winter term 2021/2022

Course information

Semester	3
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	• dr inż. Andrzej Czajkowski

Classes forms

The class form	Hours per semester (full-time)	Hours per week (full-time)	Hours per semester (part-time)	Hours per week (part-time)	Form of assignment
Lecture	30	2	-	-	Credit with grade
Laboratory	30	2	-	-	Credit with grade

Aim of the course

- Familiarize students with different approaches to create 3D computer graphics.
- Introduce modern CGI environments.
- Introduce the concepts of 3D modelling, texturing and animation.

Prerequisites

Scope

- Concepts of 3D graphics - vertex, edge and polygon
- Hard Surface and organic modelling.
- Topology of 3D models, loops and rings, subdivision.
- High and low poly modelling - optimisation of 3D models, normal map baking.
- UVW mapping - mapping coordinates, materials and maps (procedural and raster mapping)
- Key framing and interpolation in 3D animation, hierarchy with inheritance in animation.
- Lightning, shading and shadows in 3D scene - classic and physically correct lights. Exposure control.
- Rendering process - optimisation and methods

Teaching methods

laboratory classes, lecture

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to design a complex material for the texturing purpose		• a final test • an observation and evaluation of activities during the classes • carrying out laboratory reports	• Lecture • Laboratory
Student knows different approaches to create CGI		• a final test • an observation and evaluation of activities during the classes • carrying out laboratory reports	• Lecture • Laboratory
Student can create short animation using key framing and different interpolation methods		• a final test • an observation and evaluation of activities during the classes • carrying out laboratory reports	• Lecture • Laboratory

Outcome description	Outcome symbols	Methods of verification	The class form
Student is able to use different modelling techniques to achieve desirable effect		• a final test • an observation and evaluation of activities during the classes • carrying out laboratory reports	• Lecture • Laboratory
Student is able to texture a complex 3D shape using different UVW uwraping methods		• a final test • an observation and evaluation of activities during the classes • carrying out laboratory reports	• Lecture • Laboratory

Assignment conditions

Lecture - the passing criterion is a sufficient mark from the final test.
Laboratory - the passing criterion are positive marks for laboratory exercises.
Final mark components = lecture: 50% + laboratory: 50%

Recommended reading

1. D. Derakhshani, R. L. Derakhshani, Autodesk 3ds Max 2016 Essentials. Sybex, 2015
2. Kelly L. Murdock's Autodesk 3ds Max 2021 Complete Reference Guide, SDC Publications , 2020
3. S.J. Gortler, Foundations of 3D Computer Graphics, MIT Press, 2012

Further reading

1. M. McCarthy, How to Cheat in 3ds Max 2015: Get Spectacular Results Fast, Focal Press, 2014
2. Vaughan W.,The Pushing Points Topology Workbook: Volume 01, 2018
3. Adams E.: Fundamentals of Game Design, 3rd edition, New Riders, 2013

Notes

Modified by dr inż. Andrzej Czajkowski (last modification: 19-07-2021 08:03)