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 2019/2020

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 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
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

Outcome description	Outcome symbols	Methods of verification	The class form
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
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

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. K.L. Murdock, Autodesk 3ds Max 2014 Bible, Willey Press, 2013
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. M. Pricken, Creative Advertising: Ideas and Techniques from the World's Best Campaigns, Thames & Hudson, 2008
3. Adams E.: Fundamentals of Game Design, 3rd edition, New Riders, 2013

Notes

Modified by prof. dr hab. inż. Andrzej Obuchowicz (last modification: 27-10-2019 09:28)