

Computer Graphics - course description

General information	
Course name	Computer Graphics
Course ID	06.9-WM-ER-IB-33_18
Faculty	Faculty of Mechanical Engineering
Field of study	WM - oferta ERASMUS
Education profile	-
Level of studies	Erasmus programme
Beginning semester	winter term 2021/2022

Course information	
Semester	1
ECTS credits to win	5
Course type	obligatory
Teaching language	english
Author of syllabus	<ul style="list-style-type: none">dr hab. inż. Sławomir Nikiel, prof. UZdr hab. inż. Katarzyna Arkusz, prof. UZ

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

To make students aware of contemporary computer graphics (CG) technology, including the CG applications and SDKs. Understanding of CG related terminology and basic functionalities of CG systems.

Prerequisites

Introduction to computer science

Scope

Human factors. Visual perception. Creator and consumer of computer graphics content, CG models.

Introduction to computer graphics technologies. Input/Output devices. Color models. Digital images. Sample CG applications in education, entertainment, architecture, science and human care. Scientific visualization.

Raster graphics. Digital raster images. Preparation of raster images. Desk-Top Publishing and pre-press. Processing raster images.

Fractals in computer graphics, theory and applications.

Vector graphics. Computer graphics and vector models. Interpolation and interpolators. Hierarchical structure of graphics objects. Graphics rendering pipeline. 3D scene construction algorithms. Computer Aided Design. Manipulation of 3D vector objects, 3D scene representation, shading and shadows.

Photo-realistic techniques. Ray Tracing and Radiosity, Environmental Mapping and Image-Based Rendering. Stereoscopic rendering.

Review of available software tools for computer graphics.

Teaching methods

Laboratory tasks are meant to be solved in a given time. All tasks cover design, creative use of digital media within the CG environments including CG applications and SDKs. Lecture is generally based on the given references, but it includes the most recent information from conferences and events related to CG.

Learning outcomes and methods of theirs verification

Outcome description	Outcome symbols	Methods of verification	The class form
The student has an elementary knowledge of computer design and operations, has an ordered knowledge of operational systems, technologies, protocols and services in computer networks.		<ul style="list-style-type: none">a discussiona pass - oral, descriptive, test and othercarrying out laboratory reports	<ul style="list-style-type: none">LectureLaboratory
The student can select and use the specialistic informatic tools to solve engineering problems in numerical way, analyse results and present them graphically, also prepare documents and digital media		<ul style="list-style-type: none">activity during the classescarrying out laboratory reports	<ul style="list-style-type: none">Laboratory

Outcome description	Outcome symbols	Methods of verification	The class form
The student can communicate using various techniques in the professional community as well as in other communities		<ul style="list-style-type: none"> • a discussion • a pass - oral, descriptive, test and other 	<ul style="list-style-type: none"> • Lecture
The student can select and apply the appropriate computer applications to make calculations, simulation, design and verification of engineering solutions in the field of Biomedical Engineering		<ul style="list-style-type: none"> • a pass - oral, descriptive, test and other • carrying out laboratory reports 	<ul style="list-style-type: none"> • Lecture • Laboratory

Assignment conditions

Lecture – classification based upon positive mark obtained during colloquium or exam in form suggested by the teacher.

Lab - classification based upon positive marks obtained during the course. Final mark is a weighted sum of all marks obtained for the given lab tasks.

Recommended reading

1. Hearn. D, Baker D.: *Computer Graphics- C version*, Prentice Hall, 1997
2. Jankowski M.: *Elementy grafiki komputerowej*, WNT, 2006 (in Polish)

Further reading

1. Tomaszewska-Adamerek A., Zimek R.: *ABC grafiki komputerowej i obróbki zdjęć*, Helion, 2007 (in Polish)
2. Preparata P., Shamos N.: *Geometria obliczeniowa. Wprowadzenie*, Helion, 2003 (in Polish)
3. Flemming B., Dobbs D.: *Animacja cyfrowych twarzy*, Helion, 2002 (in Polish)

Notes

Students uses at labs supplementary materials obtained from the teacher and from the internet resources .

Modified by dr Katarzyna Skrzypek (last modification: 29-04-2021 11:00)

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