Course
CG - Computer Graphics

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˄ General information

Long name	Computer Graphics
Approving CModule	CG_BaMT, CG_BaTIN
Responsible	Prof. Dr.-Ing. Arnulph Fuhrmann Professor Fakultät IME
Level	Bachelor
Semester in the year	summer semester
Duration	Semester
Hours in self-study	78
ECTS	5
Professors	Prof. Dr.-Ing. Arnulph Fuhrmann Professor Fakultät IME
Requirements	Programming Mathematics 1 and 2
Language	German
Separate final exam	Yes

Final exam

Details

Students must demonstrate the following competences in a written examination:

- mastering the concepts of CG (proven by answering questions on these concepts)

- applying the mathematical basis of computer graphics (proven by arithmetic tasks)

- developing computer graphics applications (proven by developing short programs to solve CG problems)

Minimum standard

At least 50% of the total number of points.

Exam Type

Students must demonstrate the following competences in a written examination:

- mastering the concepts of CG (proven by answering questions on these concepts)

- applying the mathematical basis of computer graphics (proven by arithmetic tasks)

- developing computer graphics applications (proven by developing short programs to solve CG problems)

⌃ <u>Lecture</u>

Learning goals

Knowledge

Geometric Modeling
Polygonal meshes
subdivisional surfaces

Transformations
coordinate systems
fundamental transformations
projections

Graphics Hardware
raster displays
video cards
input devices

Rendering Pipeline
rasterization
clipping
shading
visibilty
shader programming

Local reflection models
light sources
reflection
transparency
BRDFs

Textures
texture mapping
generation of texture coordinates
filtering
normal maps
environment maps
displacement maps

Global illumination

rendering equation

raytracing

spatial data structures

shadows

Skills

- Comparison of different reflection models
- Decide which method is suitable to solve a particular problem of computer graphics

Expenditure classroom teaching

Type	Attendance (h/Wk.)
Lecture	2
Tutorial (voluntary)	1

Separate exam

^ Practical training

Learning goals

Skills

- Developing computer graphics applications
- Create interactive 3D programs
- Using a 3D API
- Applying the mathematical basis of Computer Graphics
- Applying the fundamental algorithms of Computer Graphics
- Testing and debugging of own applications
- Capturing and understanding textual instructions

Expenditure classroom teaching

Type	Attendance (h/Wk.)

Practical training	2
Tutorial (voluntary)	1

Separate exam

Exam Type

working on practical scenarion (e.g. in a lab)

Details

Development of different 3D applications with tasks to the topics of the lecture. During the laboratory the students work on the tasks with the help of the lecturer. Afterwards the independent completion takes place in self-study.

Minimum standard

More than 80% of all exercises submitted. A task is deemed to have been completed if it has been solved predominantly and independently.