3-D Computer Graphics

Programme course

6 credits

3-D Datorgrafik

TNM061

Valid from: 2017 Spring semester

Determined by
Board of Studies for Computer Science
and Media Technology

Date determined
2017-01-25

Main field of study
Media Technology and Engineering

Course level
First cycle

Advancement level
G2X

Course offered for
- Media Technology and Engineering, M Sc in Engineering
- Computer Science, Master's programme

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Computer Graphics

Intended learning outcomes
The course is aimed at providing knowledge and insight into methods for 3-dimensional computer graphics in the areas of modeling, rendering, animation and graphics programming. After the course, students should be able to use basic tools and common user interfaces to create simple but effective 3D animations on their own. Students should also be able to choose suitable methods and motivate them, and explain how they work from a technical and mathematical standpoint. They should also be able to plan and execute basic 3D graphics programming, and explain the technical differences between real time graphics and rendered content.

Course content
3D modeling: polygon meshes, various forms of parametric curves and surfaces. Surface properties, texture and bump mapping. Procedural textures. Environment mapping. Anti-aliasing.
Global illumination models: raytracing, radiosity, hybrid methods and stochastic methods.
Animation: keyframing, inverse kinematics, physical modeling, motion capture.
Graphics programming: real time graphics, scene graphs, graphics hardware.

Teaching and working methods

Lectures, lab exercises and an extensive project assignment. Lectures are based on basic material, while the project presents an opportunity to penetrate more specialised subjects in greater depth.
The course runs over the entire spring semester.

Examination

UPG1	Group project assignment	3 credits	U, 3, 4, 5
LAB1	Laboratory course	1.5 credits	U, G
TEN1	Written exam	1.5 credits	U, 3, 4, 5

The final grade is a mean value of the grades for TEN1 and UPG1, where both grades are given equal weight and any rounding is done upwards.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

Camilla Forsell

Examiner

Stefan Gustavson

Education components

Preliminary scheduled hours: 52 h
Recommended self-study hours: 108 h

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.