

SYLLABUS

Graphics programming and algorithms 7.5 credits

S0008E

Grafikprogrammering och algoritmer

Course syllabus admitted: Autumn 2021 Sp 1 - Present

DECISION DATE
2021-02-17

Graphics programming and algorithms 7.5 credits S0008E

Grafikprogrammering och algoritmer

First cycle, S0008E

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Medieteknik	Computer Technology

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and Knowledge in programming corresponding to D0009E Introduction to programming, D0037D Object oriented programming, D0041D Datastructures and algorithms. Knowledge in mathematics corresponding to M0051M Integrals, Vectors and Matrices, Calculus and linear algebra; and graphics programming corresponding to S0006E Real-time computer graphics programming or equivalent.

Selection

The selection is based on 1-165 credits.

Examiner

Patrik Holmlund

Course Aim

The course aims to give students a deeper understanding of theories in the field of computer graphics, as well as understanding of the underlying principles and algorithms behind real-time rendering.

After course completion, the student should be able to demonstrate:

- broad knowledge in the field of computer graphics and understanding of relationships at the system level
- an ability to apply knowledge of mathematics and science for specific issues. This is demonstrated through presentation of concepts for real-time rendering in computer games.
- an ability to model, simulate, predict and evaluate methods and algorithms for real-time rendering in computer games. This is demonstrated through laboratory simulations.
- an ability to identify the need for further knowledge and to continuously develop the competence. This is demonstrated through the presentation of a in-depth study and the identification of further work.
- an ability to understand, implement and develop algorithms for computer graphics and real-time rendering in computer games.
- knowledge and understanding of computer graphics role in computer games as well as insight into the development process.
- an ability to implement and develop optimised algorithms for computer graphics

Contents

During the course students work with :

- Pipeline optimization
- Algorithms for graphics accelerations
- Curves and surfaces
- Advanced real-time rendering techniques
- Global illumination
- Terrain Rendering
- Animation Systems
- Management of meshes

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course consists of lectures, laboratory work and scientific papers. Compulsory participation in laboratory work.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided. Written exam and compulsory assignments.

Overlap

The course S0008E is equal to S0010D

Literature. Valid from Autumn 2020 Sp 1

Title: Real-Time Rendering, Fourth Edition

Authors: Akenine-Möller Tomas, Haines Eric, Naty Hoffman

ISBN-10: 9781138627000

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0001	Laboratory work	U G#	4	Mandatory	A16	
0003	Written exam	G U 3 4 5	3.5	Mandatory	A21	

Last revised

by Jonny Johansson, HUL SRT 2021-02-17

Syllabus established

by Jonny Johansson, HUL SRT 2016-02-15