

SYLLABUS

Real-time computer graphics programming 7.5 credits S0006E

Programmering av realtidsgrafik

Course syllabus admitted: Autumn 2020 Sp 1 - Present

**DECISION DATE
2020-06-18**

Real-time computer graphics programming 7.5 credits S0006E

Programmering av realtidsgrafik

First cycle, S0006E

| 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 mathematics and programming, e.g. D0037D Object oriented programming, D0009E Introduction to programming, D0041D Data structures and algorithms, M0043M Mathematics II - Calculus and linear algebra or equivalent.

Selection

The selection is based on 1-165 credits.

Examiner

Patrik Holmlund

Course Aim

The course aims to give students an understanding of theories in the field of computer graphics, and understanding of underlying principles and algorithms behind the real-time rendering. The student should be able to:

- With broad knowledge in the field of computer graphics to understand the system level, and apply knowledge of mathematics and science for specific issues. It is shown through the presentation of concepts for real-time rendering in computer games.
- Model, simulate, predict and evaluate methods and algorithms for real-time rendering in computer games.
- Identify the need for further knowledge and to continuously upgrade their skills, demonstrated through the presentation of an in-depth study of the identification of further work.
- Understand, implement, and develop algorithms for computer graphics and real-time rendering in computer games.
- Have insight into the role of computer graphics in computer games as well as insight into the development process.
- Understand basic optimization algorithms for real-time rendering.

Contents

This course covers:

- The Rendering Pipeline
- Basic tools for manipulation of objects and views
- Scene graphs
- Data structures for real-time rendering
- Definition of material and light properties for real-time rendering
- Texture mapping algorithms
- Real Time Lighting and shading
- Optimization algorithms for real-time rendering

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 and seminars. Seminars are based on recent scientific publications. Mandatory 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. Compulsory assignments or seminars may occur. Each assignment is graded, after which the final grade for the course is a combination of these grades. Each assignment specifies what is required for various grades.

Overlap

The course S0006E is equal to S0016D

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 |
|------|-----------------|-------------|-----|-----------|-------------|-------|
| 0005 | Laboratory work | U G# | 0.5 | Mandatory | A20 | |
| 0006 | Laboratory work | U G# | 1 | Mandatory | A20 | |
| 0007 | Laboratory work | U G# | 1 | Mandatory | A20 | |
| 0008 | Laboratory work | U G# | 1 | Mandatory | A20 | |
| 0009 | Laboratory work | G U 3 4 5 | 2 | Mandatory | A20 | |
| 0010 | Laboratory work | G U 3 4 5 | 2 | Mandatory | A20 | |

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Jonny Johansson, HUL SRT 2020-06-18

Syllabus established

by Jonny Johansson, HUL SRT 2015-02-16