SYLLABUS

Computer graphics with virtual environments 7.5 credits M7002E

Datorgrafik och virtuella miljöer

Course syllabus admitted: Spring 2012 Sp 3 - Spring 2014 Sp 4

DECISION DATE
2011-12-20

Luleå University of Technology 971 87 Luleå, Sweden
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LULEÅ TEKNISKA UNIVERSITET

Computer graphics with virtual environments 7.5 credits M7002E

Datorgrafik och virtuella miljöer

Second cycle, M7002E

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

Entry requirements

Courses of at least 90 credits at first cycle including the following knowledge/courses. The student should be confident with data structures and object oriented programming using java and/or C++ (equivalent to D0012E Algorithms & data structures) as this course is predominantly assessed with programming assignments. Knowledge of linear algebra is also required (equivalent to M0031M Linear Algebra & Integral Calculus), specifically the following mathematical concepts; three dimensional vectors, dot product, cross product, matricies, and complex numbers.

Selection

The selection is based on 30-285 credits

Examiner

Matthew Thurley

Course Aim

To provide knowledge about the fundamental algorithms and methods in computer graphics algorithms and to develop competence in graphics programming and the construction of 3D virtual environments using scenegraphs and computer graphics APIs.

Contents

- Computer graphics systems and models
- Computer graphic programming
- Input and interaction
- Geometric transformations
- Projection and rendering of 3D images
- Object modelling, hierarchical data structures and scenegraphs
- Fundamental algorithms (rasterization clipping, hidden line and surface removal, anti-aliasing)
- Lighting and texture
- Planning, building and use of virtual environments.

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 computer implementations.

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. Programming assignments (Lab) and written exam. The course grade will be the credit-weighed average of the grades for graded items. The average grade will be rounded to the nearest whole grade. All graded items must be passed before the course grade will be set.

Remarks

The course had earlier the code SMD171, but got a new code when the level was changed. The course can therefore not be combined with the credits for SMD171.

The course will not be given every year.

Literature. Valid from Spring 2012 Sp 3

Reference literature:

Real-Time Rendering, third edition, by Möller, Haines & Hoffman ISBN 978-1-56881-424-7 (newer more current)

E. Angel, Interactive Computer Graphics: A Top-Down Approach Using OpenGL, 4th edition, Addison-Wesley, ISBN 0-201-77343-0. (older)

Course offered by

Department of Computer Science, Electrical and Space Engineering

Items/credits

Number	Type	Credits	Grade
0001	Written exam	3	G U 3 4 5
0002	Compulsory assignment	4.5	G U 3 4 5

Study guidance

http://www.ltu.se/csee/utbildning/kurser/GU?l=en

Last revised

by Jonny Johansson, Huvudansvarig utbildningsledare 2011-12-20

Syllabus established

by the Department of Computer Science and Electrical Engineering 2007-02-28