



# DH2413 Advanced Graphics and Interaction 9.0 credits

Avancerad grafik och interaktion

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

## Establishment

Course syllabus for DH2413 valid from Autumn 2009

## Grading scale

A, B, C, D, E, FX, F

## Education cycle

Second cycle

## Main field of study

Computer Science and Engineering, Information Technology, Information and Communication Technology

## Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

## Intended learning outcomes

The students should after the course be able to

- explain concepts and use methods within areas such as local and global illuminations methods, texturing techniques, perceptual aspects relevant for graphics,
- use modelling software such as Maya to build a model using a hand drawn sketch,
- use a software/API such as OpenGL to import an object from modelling software and then further elaborate the scene with special effects,
- write a survey paper within a limited area of computer graphics by using scientific papers from sources such as the SIGGRAPH conference,
- build a simple deeping application within a limited area of computer graphics,
- use established methods in advanced graphics and interaction,
- take an active part in the development of new methods in advanced graphics and interaction.

## Course contents

**Animation:** Different methods to describe animation, object orientation and constraints for animation, tools to build animation, morphing.

**Rendering:** mapping techniques, photorealistic rendering, photon mapping radiosity, fractal methods.

**3D interaction, virtual environments (VR) and visualization:** different models for 3D interaction, hardware for 3D and VR, possibilities and limitations for VR, methods, tools. Visualization.

**Multimodal interfaces:** several modes in interaction, sound interfaces, haptics.

**Perception:** the human visual system, colour, perceptual graphics.

**Assignments:** VR, haptics, animation, rendering. Final task according to the student's own choice.

Furthermore deepening assignment according to your own choice within computer graphics.

## Specific prerequisites

Single course students: 90 university credits including 45 university credits in Mathematics or Information Technology. Swedish B or equivalent and English B or equivalent.

## Course literature

Meddelas på kurshemsidan senast 4 veckor före kursstart. Föregående läsår användes A. Watt: 3D Computer graphics samt material producerat vid institutionen.

## Examination

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F
- LAB2 - Laboratory Work, 1.5 credits, grading scale: P, F
- LAB3 - Laboratory Work, 1.5 credits, grading scale: P, F
- TENA - Examination, 1.5 credits, grading scale: P, F
- TENB - Examination, 1.5 credits, grading scale: P, F
- TENC - Examination, 1.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

In this course all the regulations of the code of honor at the School of Computer science and Communication apply, see: [http://www.kth.se/csc/student/heder-skodex/1.17237?l=en\\_UK](http://www.kth.se/csc/student/heder-skodex/1.17237?l=en_UK).

## Other requirements for final grade

Examination (TENA; 1,5 university credits).  
Examination (TENB; 1,5 university credits).  
Examination (TENC; 1,5 university credits).  
Laboratory assignments (LAB1; 1,5 university credits).  
Laboratory assignments (LAB2; 1,5 university credits)  
Laboratory assignments (LAB 3; 1,5 university credits).

## Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.