



# 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

The official course syllabus is valid from the autumn semester 2024 in accordance with the decision from the director of first and second cycle education: J-2024-0634. Decision date: 2024-04-15

## 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

## Specific prerequisites

Knowledge in computer graphics, 6 credits, equivalent to completed course DD2258/DH2320 or DH2323.

# Language of instruction

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

## Intended learning outcomes

After passing the course, the student should be able to

- explain concepts and use methods in a number of subfields of computer graphics such as local and global illuminations methods, texturing techniques, perceptual aspects relevant for graphics and virtual environments
- 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.

## Examination

- IND1 - Individual assignments, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Project work, 3.0 credits, grading scale: P, F

- PRO2 - Project work, 3.0 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 PRO1 and PRO2, both oral and written reports are included with mandatory participation.

IND1 includes mandatory quizzes and individual oral interviews with the course coordinator.

## **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.