GHENT UNIVERSITY

Course Specifications

Valid in the academic year 2025-2026

Computer Graphics (C004073)

Course size *(nominal values; actual values may depend on programme)*

Credits 6.0 **Study time 180 h**

Course offerings and teaching methods in academic year 2025-2026

A (semester 1)	Dutch	Gent	lecture
			seminar

Lecturers in academic year 2025-2026

Lambert, Peter	TWO6	lecturer-in-charge
Van Wallendael, Glenn	TWO6	co-lecturer

Offered in the following programmes in 2025-2026	crdts	offering
Master of Science in Teaching in Science and Technology(main subject Computer Science)	6	A
Master of Science in Computer Science	6	A

Teaching languages

Dutch

Keywords

computer graphics, 3D, virtual reality, rendering, GPU

Position of the course

The goal of this course is to make students familiar with the basic principles of computer graphics and 3D rendering. It is also the goal to give some practical experience to students regarding the development and implementation of graphical 3D applications.

Contents

1 Introduction to computer graphics
2 Basic mathematical tools for computer graphics
3 Ray Tracing and Shading
4 Viewing Transformations and Graphics Pipelines
5 Texture Mapping
6 Spatial data structures
7 Curves and animation
8 Advanced shading
9 Virtual Reality
10 Light Fields
11 Guest lecture

Initial competences

- Software development in C++ (basic knowledge)
- Basic knowledge of multimedia coding
- Basic knowledge of linear algebra, projects, goniometrica

Final competences

1 To be familiar with data structures and data representation in the context of 3D graphics and virtual reality.
2 To know and understand the various steps in the graphics pipeline.
3 To be familiar with different shading methods and visualisation techniques for 3D graphics rendering, and the implementation thereof.
4 To be familiar with Virtual Reality technologies.
5 Have insight in complexity properties of various rendering techniques.
6 To be able to design and implement a basic 3D renderer.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture

Study material

Type: Handbook

Name: Fundamentals of Computer Graphics
Indicative price: € 80
Optional: yes
Language : English
Author : Steve Marschner & Peter Shirley
ISBN : 978-0-36750-503-5
Number of Pages : 768
Oldest Usable Edition : Fourth Edition
Online Available : Yes
Available in the Library : Yes
Usability and Lifetime within the Course Unit : intensive
Usability and Lifetime within the Study Programme : one-time
Additional information: The lessons (incl. slides) of this course are largely based on this reference book. This book is therefore necessary to follow and study the course smoothly, but there is no strict obligation to purchase the printed book, as there is also an online version that can be purchased. Moreover, the central library of UGent provides free access to an online version of the book via the library of UGent (although with a limited number of simultaneous users).

Type: Slides

Name: Slides'
Indicative price: Free or paid by faculty
Optional: no

References

Fundamentals of Computer Graphics, 5th edition, Steve Marschner & Peter Shirley,
A K Peters/CRC Press, ISBN 978-0367505035 (richtprijs: 100 euro)

Course content-related study coaching

- Supervision and support during PC exercises
- Contact with lecturer and supervisors (via e-mail or personal contact by appointment)

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Oral assessment

Examination methods in case of periodic assessment during the second examination period

Oral assessment

Examination methods in case of permanent assessment

Skills test, Assignment

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible in modified form

Calculation of the examination mark

General: students who eschew one or more parts of the evaluation can no longer pass the course as a whole. Total scores will be reduced to the highest non-deliberative quotation (7/20) in case the total score is higher.
First examination period: total score = 40% non-periodical evaluation + 60% periodical evaluation (exam). When students obtains less than 9/20 for at least one of the components, they can no longer pass the course as a whole. If the total score does turn out to be a mark of ten or more out of twenty, this is reduced to the highest fail mark (9/20).
Second examination period: total score = 60% exam + 40% non-periodical

evaluation (as obtained during the first examination period). If the score of the non-periodical evaluation during the first examination period is less than 9/20, an additional (individual) task will be defined in the second examination period. In this case, the total score = 60% exam + 40% additional task. When students obtains less than 9/20 for at least one of the components, they can no longer pass the course as a whole; if the total score does turn out to be a mark of ten or more out of twenty, this is reduced to the highest fail mark (9/20).