Module Description 39-Inf-CG Basics of Computer Graphics

Faculty of Technology

Version dated Feb 9, 2026

This module guide reflects the current state and is subject to change. Up-to-date information and the latest version of this document can be found online via the page

https://ekvv.uni-bielefeld.de/sinfo/publ/modul/26787676

The current and valid provisions in the module guide are binding and further specify the subject-related regulations (German "FsB") published in the Official Announcements of Bielefeld University.

39-Inf-CG Basics of Computer Graphics

Faculty

Faculty of Technology

Person responsible for module

Prof. Dr. Mario Botsch

Regular cycle (beginning)

Discontinued

Credit points

10 Credit points

Competencies

Non-official translation of the module descriptions. Only the German version is legally binding.

In the lecture students learn the fundamentals of computer graphics and gain practical experience by implementing most of these concepts. These include theoretical aspects of geometry representations as well as of light transport, but also practical aspects, such as efficient data structures and algorithms for real-time applications.

Content of teaching

This lecture gives an introduction to the basic conecpts of Computer Graphics, focusing on efficient rendering and realistic visualization of three-dimensional scenes. The course is organized in four parts: In the geometry part different geometry representations and modeling operations for 3D objects and 3D scenes will be discussed, such as triangle meshes, spline surfaces, or volumetric data. These models can be rendered either as realistically as possible (Global Illumination part) or as efficiently as possible (Real-Time Rendering part). In the image processing part we will discuss post-processing and compression techniques for the resulting images. To facilitate a better understanding, many of the discussed techniques will be implemented in the programming exercises, which are organized as 3-4 mini projects.

Recommended previous knowledge

Knowledge in C++ and knowledge as in the modules 24-M-Inf-1 and 24-M-Inf-2

Necessary requirements

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Explanation regarding the elements of the module

The (partial) examination of the module can be performed as "ungraded" in some study programs at the students choice. Before the examination a respective determination must be carried out, a later modification (graded -

ungraded) is impossible. If the "ungraded" option is chosen, it is not possible to include this module in a study program where this module is deemed to enter the calculation of the overall grade.

Module structure: 0-1 bPr, 0-1 uPr [1]

Courses

Title	Type	Regular cycle	Workload [5]	LP[2]
Computergrafik	exercise	WiSe	90 h (20 + 70)	3
Computergrafik	lecture	WiSe	120 h (60 + 60)	4 [Pr] [Pr]

Examinations

Allocated examiner	Type	Weighting	Workload	LP[2]
Teaching staff of the course **Computergrafik (lecture)** *Im Masterstudiengang Interdisziplinäre Medienwissenschaft ist das Modul unbenotet für Studierende, die ihr Studium ab dem Wintersemester 2017/18 aufnehmen.* *In einigen Studiengängen der Technischen Fakultät kann die Modulprüfung nach Wahl der Studierenden auch "unbenotet" erbracht werden (s. Erläuterungen zu den Modulelementen und die jeweilige FsB).* *Wird die unbenotete Option gewählt, ist es nicht möglich, dieses Modul zu verwenden, um es in einen Studiengang einzubringen, in dem dieses Modul bei der Gesamtnotenberechnung berücksichtigt wird.* *Erläuterungen zu dieser Prüfung siehe unten (benotete Prüfungsvariante).*	mündliche Prüfung	without grades	90h	3
Teaching staff of the course **Computergrafik (lecture)** *Portfolio consisting of (programming) exercises related to the lecture (passing criterion 50% of the attainable scores) and oral examination (15-25 min.) or written examination (90-120 min) regarding the material of the lecture.* *The review of the exercises also covers direct questions to the solution approach which must be answered in the exercise course.* *Oral examination (15-25 min.) regarding the material of the lecture and the exercises.* *Written examination (90-120 min) regarding the material of the lecture and the exercises.*	Klausur o. mündliche Prüfung o. Portfolio mit Abschlussprüfung	1	90h	3

Further notices

Bei diesem Modul handelt es sich um ein auslaufendes Angebot. Dieses Modul richtet sich nur noch an Studierende, die nach einer der nachfolgend angegebenen FsB Versionen studieren. Ein entsprechendes Angebot, um dieses Modul abzuschließen, wird bis maximal Wintersemester 2019/2020 vorgehalten. Genaue Regelungen zum Geltungsbereich s. jeweils aktuellste FsB Fassung.

Bisheriger Angebotsturnus war jedes Wintersemester.

Legend

1 The module structure displays the required number of study requirements and examinations.

2 LP is the short form for credit points.

3 The figures in this column are the specialist semesters in which it is recommended to start the module. Depending on the individual study schedule, entirely different courses of study are possible and advisable.

4 Explanations on mandatory option: "Obligation" means: This module is mandatory for the course of the studies; "Optional obligation" means: This module belongs to a number of modules available for selection under certain circumstances. This is more precisely regulated by the "Subject-related regulations" (see navigation).

5 Workload (contact time + self-study)

SoSe Summer semester

WiSe Winter semester

SL study requirement

Pr Examination

bPr Number of examinations with grades

uPr Number of examinations without grades