

Title of course	Computer Graphics 1 (Computergraphik 1)
Responsible instructor	<i>Prof. Hartmut Seichter, PhD</i>
Learning objectives	<i>Students are able to understand the connection between visual computing techniques and the underlying mathematical concepts and the physiognomy of human beings, especially the visual system. Students further can distinguish the differences between image synthesis methods and related techniques. Students will learn basic techniques of real-time 3D visualization and apply them in exercises.</i>
Course contents	<p><i>Computer graphics is a melting pot of computer science technologies to present digital content efficiently to users. Topics in this course:</i></p> <ul style="list-style-type: none"> <i>• Basic knowledge of the human visual system and perceptual psychological concept.</i> <i>• Image generation and storage</i> <i>• CG in professional application and entertainment</i> <i>• Display technologies</i> <i>• 3D model representations</i> <i>• Transformationpipeline: homogenous coordinates and transformations</i> <i>• Scenegraphs and realtime rendering APIs</i> <i>• Image syntesis methods: Rasterization, Raytracing and beyond.</i> <i>• Geometry and Images: samplingmethods and anti-aliasing strategies</i> <i>• Texturing, Surfaces and Materials</i> <i>• Rendering-Equation and Shadingmodels</i> <i>• Lighting models</i> <i>• Introduction to scientific and information visualization</i> <i>• Graphical User Interfaces</i>
Teaching methods	<i>Lecture (2 SWS), Exercises (2 SWS)</i>
Prerequisites	<i>Programming with OOP</i> <i>Basic knowledge of linear algebra</i>
Suggested reading	<ul style="list-style-type: none"> <i>• Foley, James D, Andries Van Dam, Steven K Feiner, John F Hughes, and Richard L Phillips. Introduction to Computer Graphics. Vol. 55. Addison-Wesley Reading, 1994.</i> <i>• Folien</i>
Applicability	<i>Master Applied Computer Science, Master Angewandte Medieninformatik</i>
Workload	<i>Total 150 hours. Attendance: 60 hours, Self-Study: 45 hours, Exam Preparation: 45 hours</i>
ECTS credit points and weighting factor	<i>5 CP (Emphasis of the Grade for the final Grade 5/120)</i>
Basis of student evaluation	<i>Oral Exam</i>
Time	<i>1st Semester</i>
Frequency	<i>Once during the academic year (winter semester)</i>
Duration	<i>One semester</i>

Course type	<i>Obligatory course from the area of software engineering</i>
Remarks	Teaching language is English.