

Course Overview

Timetable

Calendar weeks: 35–41 + 43–48.

Weekly timetable:

Wednesday	13–14	exercises	Building 305, Room 017 (VR-lab)
	14–15	lecture	Building 305, Room 052 (VR-center)
	15–17	exercises	Building 305, Room 017 (VR-lab)

Lab journal and project hand-in deadline: Monday 19 December 2011 at 23:59.

Project presentation: Thursday 22 December 2011.

Text Book and Notes

The main text book for the course is

B Alan Watt. 3D Computer Graphics, third edition, Pearson/Addison Wesley 2000.

In addition, we will upload papers to CampusNet that serve sometimes as supplementary reading material sometimes as part of the curriculum.

Prerequisites and Programming Resources

See separate documents uploaded to CampusNet File Sharing (`prerequisites.pdf`).

Project

Toward the end of the course you must choose a minor project to work on. The obvious idea is to extend one of the exercises. However, the subject of the project is more or less free as far as it has a reasonable connection with the course. You need to hand in a small project description (half a page) and get it approved by one of the course responsables. The project must be submitted to CampusNet before the final deadline (see above). The delivery must include a small project report such that it is possible to understand what has been developed and the intentions and ideas behind the project. You should also hand in the code.

Assessment

The deliverables of the weekly exercises should be submitted to CampusNet under Assignments before the lecture that introduces the next exercise. Consider these submissions to be your lab journal. If the deliverables are not submitted timely, you will receive no feedback. You are allowed to improve your submission (based on the feedback, for example) until the final deadline, see above. There is no regular oral examination in this course. The assessment is based on your lab journal and project report hand-in. The exam day is used for project presentations such that you have a chance to tell us about your project, receive feedback, and clear up any questions that we might have. Your work is assessed in its entirety and you will be graded using the 7-step scale.

About the Exercises

The lab exercises take place in the VR-lab in building 305, room 017. For most of the exercises, we use a C/C++ compiler such as Visual Studio 2008. We recommend that the exercises are solved in groups of two. However, you must submit the deliverables to CampusNet individually.

The user-id for the system is your ordinary CampusNet user-id. You can use the lab in the period reserved for the course. At other times you have to respect reservations. Remote login is not permitted. In vacant periods or when a course does not fully use the reservation made, you can use the workstations on a first come first served basis. You need your student identity card to get entrance permission to the lab and you have to show the card on any request.

Do not use the C-disk for storing your data. You can store your data on the student disk S (\\nas1.dtu.dk), on the local server VR00 (disk N), or temporarily on local machines (disk L). Disks N and L are only available for special purposes. There is no back-up in the VR-databar. The C-disk, the N-disk, and the L-disk may be cleaned daily. Use a CD-RW or a memory stick for backup.

Preliminary Weekly Schedule

Week	Subject	Curriculum	Exercises
1 29/8 -2/9	Introduction, ray casting.	B: Sections 1.3–1.4.4, 5.1.3 (16 pages) N1 [Foley et al. 1996] (15 pages) Lecture notes (6 pages)	Worksheet: <i>Week 1</i>
2 5/9 -9/9	Ray tracing, reflection and refraction, local reflection models.	B: Sections 10.1.3–10.3.1, 12.1–12.4 (18 pages) B: Section 1.4.6 (3 pages) B: Sections 6.2.1–6.2.2 (6 pages)	Worksheet: <i>Week 2</i>
3 12/9 -16/9	Object representation, acceleration structures, GPU acceleration.	B: Sections 2–2.3 (30 pages) B: Sections 12.4–12.5 (13 pages) N2: Sections 1–5 [Parker et al. 2010] (7 pages)	Worksheet: <i>Week 3</i>
4 19/9 -23/9	Radiometry, photometry, colour systems.	N3 [Hanrahan 1993] (28 pages) B: Chapter 15 (25 pages)	Worksheet: <i>Week 4</i>
5 26/9 -30/9	Radiosity.	B: Sections 11.1–11.6 (18 pages) N4: Sections 3–3.3 [Cohen and Wallace 1993] (8 pages)	Worksheet: <i>Week 5–6</i>
6 3/10 -7/10	Hierarchical Radiosity.	B: Section 11.7 (17 pages) N4: Chapter 7 (42 pages)	Worksheet: <i>Week 5–6</i>
7 10/10 -14/10	Monte Carlo techniques, anti-aliasing.	B: Sections 10.4–10.11 (18 pages) B: Sections 14.1–14.5 (10 pages)	Worksheet: <i>Week 7</i>
8 24/10 -28/10	Photon mapping.	N5: pp. 11–38 [Jensen and Christensen 2000] (28 pages)	Worksheet: <i>Week 8–9</i>
9 31/10 -4/11	Global illumination, rendering equation.	B: Sections 10–10.1.2 (7 pages) N3	Worksheet: <i>Week 8–9</i>
10 7/11 -11/11	Texture mapping.	B: Sections 8–8.6 (28 pages)	Worksheet: <i>Week 10</i>
11 14/11 -18/11	BRDF, Fresnel reflectance, absorption.	B: Chapter 7 (18 pages)	Worksheet: <i>Week 11</i>
12 21/11 -25/11	Geometric models.*	(B: Chapter 3, 57 optional pages)	Project work. Course evaluation.
13 28/11 -2/12	Volume visualization,* course finalisation.	(B: Chapter 13, 22 optional pages)	Project work.

* Advanced topic covered for inspiration.