Module title Ray Tracing & Global Illumination				
Module code DRGI	**Level** Bachelor (B.Sc.)	**Hours per week** 4	**ECTS credits** 5	**Duration** 1 semester
Module instructor Prof. Dr. Selgrad	**Lecture type** Interactive seminar with integrated exercises / lab sessions	**Prerequisite(s)** You should bring: C and an object-oriented language You should know: The tutorials will be programming-heavy, there will be math, lecture will be held in English (feel free to speak English or German).	**Grading** Final written exam	

Content

Recently, ray tracing has become a news item with hardware vendors providing support even in their consumer products and games adapting to this change. Beyond that, the technique is also widely used in the movie industry.

In this course we will first look at the mechanics of ray tracing and how to make it go fast. In the tutorials you will have the opportunity to write the core-part of a ray tracing system (in non-fancy C++, should be doable with a Java background).

The second part of the course will be less technical. We will discuss path tracing, a physically based rendering approach that can compute convincing images. To this end we will investigate the path integration formula and how to properly sample it. In the tutorials we will then build upon the ray tracing code of the first part to compute higher quality images as we consider ever more of the mathematical findings from the path integration formalism.

Organizational aspects

- You can take this course without having attended the “computer graphics” lecture last term, I will start from the beginning
- Assignments will be in C++
- Assignments should be worked on in teams
- Since successful completion of the assignments is not mandatory to take the exam you should feel free to discuss your work and share ideas across teams
- Still, the final exam will, of course, encompass the practical part, so please take the former as a means to further understanding, not just to get the assignments done faster ;)
- The lecture will be held live, but recorded
- I will probably write a lot by hand and only have slides as supporting material (gives you more time to take in the formalism)

Textbook/teaching material

- tba

Note: this is not the official course descriptor according to the “Studien- und Prüfungsordnung” (SPO)