

## Welcome to the course SK2330!

This is also the course memo of the PhD level course FSK3330.

The course consists of lectures, computer labs, practical lab and written exam. For SK3330 there is also a presentation and an additional lab.

The course literature is a compendium written by Ove Axner. It can be bought at the student office (Kursexpeditionen) at level 5 in AnbaNova.

### To pass the course

#### To pass SK2330, you need to

- Complete 5 computer labs and reports, on time.
- Complete one practical lab
- Pass the exam, which also sets the grade A-F.

#### To pass the PhD course SK3330, you need to

- present one of the home tasks to the class during lecture
- Complete 5 computer labs and reports, on time.
- Complete one practical lab
- Actively participate in lecture 12 completing a short lab on the disposable camera.
- Pass the exam, which also sets the grade A-F.

### Intended learning outcomes

After completing this course, the students should be able to

- Apply geometrical optics methods, such as lens formulas, graphical methods and ray-tracing, to analyze optical systems.
- Identify and calculate third-order Seidel and first-order chromatic aberrations, and apply standard design methods to minimize these aberrations.
- Describe tools (for example MTF, PDF, spot diagrams, or lists of aberration coefficients) for system evaluation, and apply these tools to judge the suitability of an optical system for a specific task.
- Use ray-tracing software to analyze and optimize optical systems.
- Discuss different approaches and methods of optical design.

### Lab and computer labs

#### Laboratory task

One laboratory task should be completed. Students and assistant meet by the tables on level 2 in AlbaNova and the go to the lab rooms. Please note that labs start at e.g. 8.00 or 13.00 sharp, not quarter past. At present, there is one lab session in the schedule. If it suits the students badly, we will change it. More sessions might be added if needed.

## Computer labs

5 computer tasks should be completed by the given hand-in dates. We will be using an optical design software called Synopsys, which can be downloaded from the manufacturer's homepage [www.osdoptics.com](http://www.osdoptics.com). We can use the free version, which limits the number of surfaces to 12 but still allows optimization. The program is installed in the computer room RB33, but you can also download and install it on your own computer.

The labs are best handed in via canvas, but can also be given to the lecturer or assistant in paper form.

Due to low attendance during previous years, there will be no scheduled sessions in the computer room. Instead, there are 4 one-hour sessions scheduled directly before or after the lectures, often in the same room as the lecture for easy access. During these sessions you will receive assistance on the computer tasks. If you have a laptop, bring it. If not, put your files on a USB stick, so they can be uploaded to the laptop brought by the assistant.

Computer task 1 should be handed in by November 7.

Computer task 2 should be handed in by November 16.

Computer task 3 should be handed in by November 28.

Computer task 4 should be handed in by December 12.

Computer task 5 should be handed in by December 14.

Please note that the hand-in dates of the last two labs, which are the most advanced, are quite close together. Start early!

## Examination

For SK2330, the examination consists of the lab, computer labs, and exam. The grade on the exam (A-F) determines the grade on the course.

You may bring any materials to the exam, except those that can be used for communication with the outside world, and those where you can install commercial ray-tracing software. So no phones, computers or anything in between. But bring for example your book, notes and calculator. Don't forget a ruler, to draw ray diagrams, and something to eat or drink.

The grading is done by the number of credits on the exam: 0–8p F, 9–11p Fx, 12–14p D, 15–18p C, 19–21p B, 22–24p A.