Welcome to the x-ray physics course! Please read the general course information below.

**Course organization**

The course contains 12 x 2h meetings and a 3h laboratory on basic x-ray properties.

The first meetings are lectures presented by Ulrich Vogt and Jonas Sellberg and deal with the most important concepts of x-ray physics which are essential for all further understanding of modern x-ray physics research.

In the remaining 5-6 meetings students have to give a presentation on an x-ray application example.

Another important part of the course is a student x-ray lab, done in small groups.

**Lectures (with homework problems)**

1. Introduction
2. X-ray interaction with matter
3. X-ray sources
4. X-ray optics
5. Coherence and x-rays, x-ray detectors
6. X-ray free electron laser

**Student seminar with presentations**

Please find detailed information in the module "**Student presentation (https://kth.instructure.com/courses/8195/modules/19868)** ".

**X-ray lab**

Please find detailed information in the module "**X-ray lab (https://kth.instructure.com/courses/8195/modules/19867)** ".

**Examination**

The examination consists of two parts:

**Part 1 (INLA 3 hp)**: homework problems and lab report, grading pass/fail.

***Homework problems****:* You have two weeks for the solution of each problem sheet, and there are 5 homework problem sheets in total. The homework problems can be found in the module "**Homework (https://kth.instructure.com/courses/8195/modules/19866)** ".

Every student has to hand in his/her own set of solutions in on CANVAS as pdf document.

Note: There is an automatic check for plagiarism, including other submitted work!

You can earn a total of 56 points, and you need at least 34 points (= 60%) to pass. Additionally you need at least 10% of the points on each of the 5 problem sets to pass.

***Lab report**:* Each lab group (not each student!) has to write a **small** report about the results. More details in the corresponding module. **The latest date for handing in the report is 24$^{th}$ March 2019**. Grading for the report is pass/fail, please send the report by email to Ulrich: uvogt@kth.se.

**Part 2 (REDA 3 hp)**: Presentation and oral examination, grading A-F.

This examination part has two steps. The first step is the presentation given by the students in groups of 2 students. For details, check the corresponding module. **Due to the risk of low student attendance participation in part 2 is compulsory, you have to be present at least 70% of the time.** Remember that the presentation in front of an audience is an important learning outcome of the course and it is a question of fairness to listen to the talks of your colleagues.

The second step is a short (15 min) **oral examination about your presentation topic and its connection to the main course content and another application example**. The individual times and dates for this examination will be defined separately, but are on Fri 8/3 and Mon 11/3. The grading for both parts together is A-E and will determine your overall final grade for the course.

Grading criteria for presentation and oral exam:

E: recall the basic experimental arrangement of the application

D: explain the basic experimental arrangement of the application

C: explain in detail the different aspects of the application

B: analyze in detail the different aspects of the application

A: analyze in detail the different aspects of the application and its relation to another application example

PhD students (SK3550) can just get a pass/fail grade on the course and therefore participation in the oral exam is not necessary.

**Course literature**

The course is not based on a specific book, but most of the course content can be found in:

**D. Attwood and A. Sakdinawat, X-Rays and Extreme Ultraviolet Radiation: Principles and Applications (Cambridge University Press, 2016)**

This is the best book in the field of x-ray physics, an it comes with a large **supporting material**

(https://bcourses.berkeley.edu/courses/1455386/files) .

(http://www.coe.berkeley.edu/AST/sxreuv/)