Faculty of Science

MAXM32, Applications of X-Ray and Neutron Scattering in Biology, Chemistry and Physics, 7.5 credits

Tillämpningar av röntgen- och neutronspridning i biologi, kemi och fysik, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2012-10-18 and was last revised on 2012-10-18. The revised syllabus applies from 2012-10-19, spring semester 2013.

General Information

The course is an elective second-cycle component of a degree of Bachelor or Master of Science in the main fields of physics and synchrotron radiation based science

Language of instruction: English

Main field of studies	*Depth of study relative to the degree requirements*
Synchotron Radiation Based Science	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The objective is that the students, on completion of the course, shall have acquired the following knowledge and skills.

Knowledge and understanding

On completion of the course, the students shall be able to

- explain how large research facilities are used for X-ray and neutron experiments on biological systems (e.g. proteins and membranes) and for studies of the chemical and physical properties of materials (e.g. polymers and crystals)
- solve problems and perform virtual experiments using scattering methods

Competence and skills

On completion of the course, the students shall be able to

- participate in the set-up, execution and data analysis of a scattering experiment

Course content

The course includes the following components:

- Introduction to basic scientific concepts, such as biological material, materials chemistry, "soft matter" and condensed matter
- An overview of basic scattering
- X-ray and neutron production and facilities
- Scattering methods and examples of applications in science
- Implementation of experiments, including writing applications, and analysing and presenting data

Course design

The teaching consists of compulsory lessons, exercises and virtual experiments for a period of approximately 3 weeks. In addition, there will be social activities which are voluntary, but recommended. This component corresponds to 5 credits.

The students are also to write a paper, worth 2.5 credits, related to the content of the course.

Assessment

The assessment is based on active participation in exercises, experiments and a final presentation. The paper is to be submitted within 3 weeks after the end of the course.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass.
For a grade of Pass on the whole course, the student must have passed the paper and participated in all compulsory components.

Entry requirements

To be admitted to the course, students must have at least 90 credits in science or engineering.

Further information

The course is a collaboration between the University of Copenhagen, the Technical University of Denmark, Lund University and Roskilde University. At least 6 of the 24

study places on the course are reserved for Lund University.

Subcourses in MAXM32, Applications of X-Ray and Neutron Scattering in Biology, Chemistry and Physics

Applies from H12

1201 Exercises, Experiments and Final Presentation, 5,0 hp
Grading scale: Fail, Pass
1202 Essay, 2,5 hp
Grading scale: Fail, Pass