LUND UNIVERSITY
Faculty of Medicine

Fastställd av FUN 2018-10-04,
gäller från 2018-10-04

Research Programmes Board, FUN

Course title in English: MAXIV/ESS-based imaging for medical and biomedical research, introduction

Course title in Swedish: MAXIV/ESS-baserad bildgivning för medicinsk och biomedicinsk forskning, introduktion.

1.5 credits Third cycle

General information

With MAXIV and ESS, European research and innovation landscape is changed dramatically. The proximity of the new giant world class facilities to Lund University provides a unique opportunity to use modern x-ray and neutron sources for the research including medicine. This cross-disciplinary course will help to understand how to immerse MAXIV/ESS based techniques into medical and biomedical research for doctoral students and postdoctoral researchers.

Language of instruction: English

Aim

The course aims to provide participants with an opportunity to increase their understanding of how MAXIV/ESS-based techniques could be implemented in medical and biomedical research.

Learning outcomes

On completion of the course, participants shall be able to:

- ✓ evaluate the strengths and limitations of different MAXIV/ESS techniques;
- ✓ choose appropriate MAXIV/ESS based application for medical or biomedical experiment;
- ✓ design experiment using mentioned above techniques.

Course content

The course curriculum comprises lectures and seminars, which will deepen the understanding of how to use MAXIV/ESS-based techniques for medical and biomedical research.

The course contains:

- ✓ Short introduction to the basic properties of X-rays and neutrons (nature, generation, interaction with the sample);
- ✓ Short introduction to the different techniques such as Infrared microscopy, X-ray tomography, Scanning X-ray fluorescence, Solution and surface scattering of X-rays and neutrons from biological samples, which will be available at MAXIV and ESS;
- ✓ Examples of medical and biomedical research projects using mentioned above techniques.
- ✓ Introduction to experimental design at x-Ray and neutron source facilities.

Course design

The course is structured around a number of course meetings, containing lectures and seminars in a workshop-like manner.
As an individual assignment, each participant analyses and develops an experiment which could be done at MAXIV or ESS facility of their own choice. As preparation for the course meetings, participants read assigned literature. Lectures and seminars, writing an essay, final group discussion are compulsory components of the course.

Assessment

Attendance and active participation in all parts of the course is required, as well as an individual course assignment.

Grades

Pass or Fail.

Admission requirements

Admission to PhD studies with a background in biology, bio-medicine or medicine.

Reading list

No compulsoty reading.