Kursnamn Elektronmikroskopi

Omfattning (högskolepoäng) 5
ECTS credits

Tidsperiod February-Mars 2015

Course period

Antal platser 32

Maximum number of participants

Undervisningsspråk Engelska

Language of instruction

Kursens syfte samt motivering till varför den bör vara fakultetsgemensam (max 150 ord)
Aim of course and motivation as to why it should be considered “multidisciplinary” to the extent that the faculty should allocate extra financing.

Aims:

Overall:
Wake the curiosity to look at materials on the down to single atom scale and the wish to relate this knowledge to our macroscopic materials properties.

Concrete:
1) Develop skill to evaluate the impact of nano- and atomic level characterization and structuring on development of novel materials. 2) Understanding of basic principles of electron/ion-matter interaction. 3) Methods in electron microscopy and focused ion beam technique.

The course addresses PhD students from Chemistry, Physics and Engineering department and is cross disciplinary. Biology students equally are welcome (we frequently have very successful biology students in the course). The inclusion of topics on electron microscopy on soft matter gives insight for students with a materials’ science background in characterisation methods of biological materials. Students from biology and chemistry are welcome to learn the basics of electron microscopy which has a strong presence in both, materials and life science.

Kursinnehåll, kursens uppläggningsamt examinationsform (max 150 ord)

In this course we will teach the methodology that is needed to use electron microscopes and focused ion beams for characterization of materials and to make an active contribution to the development of modern materials. The course contains the following parts: 1) Electron microscopy techniques, their basis and electron-sample interaction. 2) We will illustrate the use of electron microscopy with the corresponding applications in materials science, physics, chemistry and biology. 3) The focused ion beam device is presented with its capacity sputter samples with a nanometer precision as well as to use it for a local TEM sample lift-out. 4) The students will be confronted to selected problems/techniques in the laboratory course sessions in the state of the art Analytical Laboratory. The course will be evaluated by assignments that are related to course contents as well as by a final oral exam. We build a special tutorial program to improve the student centered learning and group work.

Målgrupp/er (specifiera ämnen/inriktningar) samt rekommenderade förkunskaper
Target group/s (specify, if possible, subject/specialization) and recommended background

Students from engineering, materials' science, physics, chemistry, medicine, pharmacy and biology. Recommended background: students from a broad background are accepted.

Huvudansvarig institution: Teknikvetenskaper/tillämpade materialvetenskap

Andra inblandade institutioner (specifiera hur).
Kursen är samorganiserad mellan lärare från 6 elektronmikrokopienheter. Enheter bidra med föreläsning och labkurs.
Medicinsk cellbiologi (Prof. Gunilla Westermark)
Evolutionsbiologi (Stefan Gunnarsson, TEKNAT)
Trädvetenskap (SLU, Geoffrey Daniel)
Analytisk Kemi – Kemi BMC (Katarina Edwards, TEKNAT)
Immunologi, Patologi, Genetik (Anders Ahlander, Lena Claesson-Welsh)
Geologi (Jarek Majka, Valentin Troll)

Kontaktperson/er (namn, e-postadress)
Contact person (name, e-mail address)
Klaus Leifer, klaus.leifer@Angstrom.uu.se
Stefan.Gunnarsson@ebc.uu.se

Anmälan om kursdeltagande till
Application from course participants should be sent to
Klaus Leifer

Senast 30th January 2015