**Kursnamn** Principles of Modern Structural Biology

**Name of course**

**Omfattning (högskolepoäng)** 3hp

**ECTS credits**

**Tidsperiod höst 2014 & 2015**

**Course period**

**Antal platser** 20

**Maximum number of participants**

**Undervisningsspråk** English

**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.

PhD students in many different fields of natural and technical sciences work in projects related to biological macromolecules. However, many of them lack the awareness and understanding of what structural biology can tell them about these molecules and the biological processes they are involved in. The aim of this course is to help the participants learn central aspects of structural biology, understand the basic principles of different structure determination methods, including their relative strengths and limitations, to provide the background needed to interpret and analyze published structures. After the course, participants should be able to analyze known structures and/or collaborate with a structural biologist in their own projects. The course should be faculty-wide since structural biology is at the cross-road between biology, chemistry and physics. The studies of biological macromolecules are faculty-wide.

**Kursinnehåll, kursens uppläggning samt examinationsform (max 150 ord)**

Contents, study format and form of examination

The course will be given as 10 half-day sessions with approximately 50% lectures and 50% computer exercises. The lectures will cover basics of macromolecular structure; basic theory, principles and practical aspects of the three most dominant macromolecular structure determination methods (X-ray crystallography, NMR, and electron microscopy) and provide the students with examples of how structure analysis can be used to answer questions in biology, chemistry and biophysics. We will take advantage of our local expertise in X-ray crystallography and invite two guest lecturers to discuss NMR and electron microscopy. The computer exercises will be in the form of hands-on practicals using freely available molecular graphics software to validate and analyze different aspects of protein structures to generate publication quality illustrations. To pass the course requires active participation in all sessions.

**Målgrupp/er (specifiera ämnen/inriktningar) samt rekommenderade förkunskaper**

Target group/s (specify, if possible, subject/specialization) and recommended background

PhD students (and researchers) in biology, chemistry and physics interested in biological macromolecules and structural aspects of biological processes. Open to
PhD students in all disciplines with some prior knowledge of biological macromolecules

Huvudansvarig institution: Cell and Molecular Biology
Department with main responsibility

Andra inblandade institutioner (specifiera hur):
Other departments involved (specify how).

Kontaktperson/er (namn, e-postadress)
Contact person (name, e-mail address)
Yafei Huang, yafei@xray.bmc.uu.se
Stefan Knight, stefan.knight@icm.uu.se

Anmälan om kursdeltagande till
Application from course participants should be sent to
Yafei Huang

Senast 2014-09-01
Not later than