



Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

Department of Molecular Sciences

COURSE SYLLABUS

2019-10-11

Course syllabus – doctoral education

Course title in English and Swedish

Applied biomolecular NMR spectroscopy

Tillämpad biomolekylär NMR-spektroskopi

Number of higher education credits

2

Subject

Chemistry

Language of education

English

Entry requirements

The course is primarily intended for PhD students within the SLU Graduate School Focus on Food and Biomaterials, but will be open for other interested PhD students and researchers if space allows.

The course does not require any previous experience in NMR spectroscopy.

Learning outcomes

After completing the course the student shall be able to:

- Propose suitable strategies to analyze a given sample by NMR spectroscopy.
- Perform simple NMR experiments under supervision.
- Discuss NMR strategies that are brought up in the course in relation to possible applications from his/her own research projects.

Objectives and content

The course gives an overview about NMR strategies that can be performed on biomolecules, such as proteins, peptides, carbohydrates, lipids, and small metabolites. The main objective is to provide the students with knowledge about possibilities and limitations with NMR spectroscopy. The course is focused on the practical performance and outcome of NMR experiments and just gives a very brief introduction to the theoretical principals.

The course is divided into two modules: A theoretical overview of NMR applications for different biomolecules and then practical exercises in the NMR lab.

The first module includes lectures in NMR applications on proteins, peptides, carbohydrates, nucleic acids, lipids and small metabolites by experts in the different areas. It also contains a brief introduction to semi-solid (HR-MAS) and solid-state (CP-MAS) NMR.

The second module is based on a short NMR project that should be related to a research project where the PhD student is involved. The student defines the project and prepares samples as well as NMR experiments under supervision. The project is finally presented in a written report and at a seminar.

Attendance at all scheduled activities is obligatory.

Pedagogical form

Lectures, practical demonstration, project-based laboratory exercise, and a final seminar. Learning outcomes are practiced during the laboratory exercise and the seminar.

Time table

The course extends over two weeks. During the first week, four days will be devoted to lectures and to a demonstration of the NMR facility. The second week starts with three days of practical training, where each student has about half a day of NMR time. After one day of preparing a report on the results, the final day is devoted to a seminar where the students present the outcomes of the projects.

Examination

Attendance at all scheduled activities and approved individual report on the NMR project.

Contact for application and further information – name and e-mail address

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