



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Avancerad analytisk kemi **Advanced Analytical Chemistry**

KASN45, 7,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED B/K

Date of Decision: 2023-04-18

General Information

Main field: Pharmaceutical Technology.

Elective Compulsory for: MLAK1

Elective for: B4-l, B5-mb, B5-lm, K4-l, MBIO1, MLIV1

Language of instruction: The course will be given in English on demand

Aim

The aim of the course is to provide advanced knowledge in and insight into modern analytical techniques including chromatography, capillary electrophoresis, field-flow fractionation and mass spectrometry.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- be able to explain advanced theories in different analytical principles and techniques comprised by the course
- be able to describe, evaluate the choice of and optimize the chosen separation technique for analysis of low and high molecular weight compounds
- be able to explain the meaning of concepts used in quality assessment of analytical results

Competences and skills

For a passing grade the student must

- show abilities in handling advanced analytical techniques
- be able to interpret experimentally generated data and compile these into concise,

clearly written reports

Judgement and approach

For a passing grade the student must

- understand how the choice of an analytical technique and method affects the quality of the analytical result

Contents

The course comprises different analytical separation techniques and methods, such as HPLC, UHPLC and LC/MS, GC and GC/MS, CE (capillary electrophoresis), SFC (supercritical fluid chromatography) and FFF (flow field fractionation), for characterization and quantitation of low and high molecular weight substances normally utilized in pharmaceutical, food, environmental, biotechnical and biochemical analysis. An important part of the course comprises strategies for technique/method selection and optimization for effective separation and detection conditions. Also, strategies for method validation and sustainable development are highlighted. Lectures in green analytical chemistry and current research in the topic are also included.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: Written examination, laboratory work and reports. The final grade will be based on the written examination.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts

Code: 0120. **Name:** Written Examination.

Credits: 6. **Grading scale:** TH. **Assessment:** Written examination covering lectures, course literature and the experimental parts of the course.

Code: 0220. **Name:** Laboratory Experiments.

Credits: 1,5. **Grading scale:** UG. **Assessment:** Mandatory attendance at laboratory exercises and approved written reports.

Admission

Assumed prior knowledge: KAKF01 Analytical Chemistry or KAKF05 Analytical Chemistry

The number of participants is limited to: 24

Selection: Completed university credits within the programme. Priority is given to students enrolled on programmes that include the course in their curriculum.

The course overlaps following course/s: KAKN05, KAK050, KASN05, KEMM06, KEMM76

Reading list

- D. C. Harris: Quantitative Chemical Analysis. 10th ed. Freeman , 2020, ISBN: 1-319-

32450-9.

- L. R. Snyder, J. J. Kirkland, J. W. Dolan: Introduction to Modern Liquid Chromatography, Third Edition. John Wiley & Sons, Inc., 2010, ISBN: Print ISBN: 9780470167540 |Online ISBN: 978047050818.
- S. Fanali, P. R. Haddad, C.F. Poole, M-L Riekkola: Liquid Chromatography (second edition), Fundamentals and Instrumentation. Elsevier, 2017, ISBN: 978-0-12-805393-5 <https://doi.org/10.1016/C2015-0>.

Contact and other information

Course coordinator: Universitetslektor Margareta Sandahl,
margareta.sandahl@chem.lu.se