

Liquid Chromatography and Mass Spectrometry

LOKT.06.016 (6 ECTS)

7.02.2018

1

Overview

- Advanced course of **liquid chromatography (LC)** and **mass spectrometry (MS)**
- Contents:
 - Chromatographic process and its models
 - Principles of operation of LC and MS instruments
 - Sample preparation and inlet/ionization systems
 - Column chemistry and column types
 - Method development and validation
 - HRMS and IRMS

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2

Course info

- Moodle: <https://moodle.ut.ee/course/view.php?id=3814>
- Teachers:
 - Koit Herodes, koit.herodes@ut.ee
 - Riin Rebane, riin.rebane@ut.ee
 - Ivo Leito, ivo.leito@ut.ee
- Work modes:
 - Lecture
 - Seminar/discussion
 - Small lab part
 - Independent work

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3

Course timing and programme

- **Timing:**
 - Lecture/seminar: Mon 14:15 (1100), Wed 12:15 (1022)
 - Lab: Fri 8:15 and 14:15
 - Will be arranged separately
 - Start will be announced
- **Programme:**
 - Available in Moodle
 - will not necessarily be followed in the same sequence as in the programme
 - Some fragmenting is possible
 - Some parts may be left for independent study

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4

Exchange of information

- **Whatever teacher says in the class, it is assumed that all have heard it!**
- **Who was not present: please ask your friends!**
- **Please make sure that your e-mail adress in the SIS works**
 - E-mail via SIS is often used for sending information

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Exam

- The course ends with an exam
 - Written
 - No usage of materials
 - Exam questions will be of two types:
 - 4 questions known beforehand, compiled on the basis of actually learned topics
 - 1 problem question, not known beforehand
 - But based on the discussion in the classroom
- The exam grade is based on your performance (... not just on your effort)

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6

Liquid chromatography (LC)

- Separation mechanisms
 - Normal phase and reversed phase LC
 - Size exclusion LC
 - Ion chromatography
 - Affinity chromatography
 - Models
- Stationary phases and columns
- Equipment
 - Pumps, degassers, introduction systems, detectors
- Liquid-chromatographic method
 - Development and optimization
- Sample preparation

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7

Mass spectrometry (MS)

- Design of mass spectrometers
 - Ionization methods
 - Mass analyzers
 - Ion trap, quadrupole, TOF, ICR, Orbitrap
 - Ion detectors
 - Vacuum, obtaining and measurement
- Connecting LC and MS
- Applications
 - Chemical analysis
 - Identification
 - Structural analysis
 - Isotope ratios

7.02.2018

8