

ATM320 Mass Spectrometry in Atmospheric Sciences and Environmental analysis (2020-2023)

HUOM! OPINTOJAKSOJEN TIETOJEN TÄYTTÄMISTÄ KOORDINOIVAT KOULUTUSSUUNNITTELIJAT HANNA-MARI PEURALA JA TIINA HASARI

- 1. Course title
- 2. Course code
- 3. Course status: optional
- 4. Course level (first-, second-, third-cycle/EQF levels 6, 7 and 8)
- 5. Recommended time/stage of studies for completion
- 6. Term/teaching period when the course will be offered
- 7. Scope of the course in credits
- 8. Teacher coordinating the course
- 9. Course learning outcomes
- 10. Course completion methods
- 11. Prerequisites
- 12. Recommended optional studies
- 13. Course content
- 14. Recommended and required literature
- 15. Activities and teaching methods in support of learning
- 16. Assessment practices and criteria, grading scale
- 17. Teaching language

1. Course title

Massaspektrometria ilmakehätieteissä ja ympäristöanalytiikassa
Mass Spectrometry in Atmospheric Sciences and Environmental analysis
Mass Spectrometry in Atmospheric Sciences and Environmental analysis

2. Course code

ATM320

Aikaisemmat leikkaavat opintojaksot 530264 Massaspektrometria ilmakehätieteissä ja ympäristöanalytiikassa, 3-5 op ja 55244 Massaspektrometria ilmakehätieteissä ja ympäristöanalytiikassa, 3-5 op.

3. Course status: optional

-Which degree programme is responsible for the course?
Master's Programme in Atmospheric Sciences

-Which module does the course belong to?
ATM300 Advanced Studies in Atmospheric Sciences
optional for

- Study Track in Aerosol Physics
- Study Track in Atmospheric Chemistry and Analysis

-Is the course available to students from other degree programmes?
Yes

4. Course level (first-, second-, third-cycle/EQF levels 6, 7 and 8)

Master's level, degree programmes in medicine, dentistry and veterinary medicine = secondcycle degree/EQF level 7
Doctoral level = third-cycle (doctoral) degree/EQF level 8

-Does the course belong to basic, intermediate or advanced studies (cf. Government Decree on University Degrees)?
Advanced studies

5. Recommended time/stage of studies for completion

Can be chosen whenever during Master's studies

6. Term/teaching period when the course will be offered

Lectures in period III (lecture part) Monday and Wednesday 8-10 and independent work (research plan/essay and presentation) part during period IV.
Every other year (odd years, next time spring 2021)

7. Scope of the course in credits

5 cr

8. Teacher coordinating the course

Tuukka Petäjä and Federico Bianchi

Teachers: responsible persons, Tapio Kotiaho and visitors

9. Course learning outcomes

After the course a student:

Has knowledge about mass spectrometric methods used in atmospheric sciences and environmental analysis

Understands principles of different techniques presented, is able to compare different techniques and knows advantages and disadvantages of various techniques presented

Knows how to utilize mass spectrometry in research

10. Course completion methods

Lectures, a presentation (presence required) of a written research plan/essay and exam

11. Prerequisites

Mass spectrometry (KEM334) or corresponding knowledge

12. Recommended optional studies

13. Course content

The aim of the course is to teach principles of the latest mass spectrometric techniques, especially techniques that are used or developed for atmospheric sciences and environmental analysis. The emphasis is in atmospheric pressure ionisation techniques. Chemical ionization is an important topic. Different desorption/ionisation methods and miniaturisation of mass spectrometric methods are also included to the course topics. Liquid chromatography–mass spectrometry and its applications is also a topic. Development of mass spectrometric instrumentation for measurements needed in atmospheric sciences is presented including their recent application.

14. Recommended and required literature

Material in Moodle and other possible material given during lectures.

15. Activities and teaching methods in support of learning

Lectures and exercise. Exercise (2 credits out of 5) include preparing a research plan/essay, how to use mass spectrometry in the study field of the student and an oral presentation of the research plan/essay. Students attending the course are evaluating each other's presentations. Teachers act as journal editors and students as journal reviewers.

16. Assessment practices and criteria, grading scale

General scale 0-5. Accepted exam (50% of total points are required to pass) and accepted written research plan/essay including presentation. Grade is weighted (exam 3/5 and report+presentation 2/5) average of the grades of the two parts.

17. Teaching language

English

Additional information:

More information about the course (program and requirements) is told during the first lecture.

Updates and changes possible.