



DEPARTMENT OF CHEMISTRY AND MOLECULAR BIOLOGY

KEM720 Aerosols, 15 credits

Aerosoler, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Chemistry and Molecular Biology on 2019-03-27 to be valid from 2019-03-27, spring semester of 2019.

Field of education: Science 100%

Department: Department of Chemistry and Molecular Biology

Position in the educational system

The course is placed on the level 60-90 credits for Degree of Bachelor in chemistry or environmental sciences and can be counted in as a second-cycle course for Degree of Master (120 credits) in chemistry or environmental sciences. The course can be read as a free-standing course.

The course can be part of the following programmes: 1) No translation available (NKEMM), 2) Atmospheric science (NATVM), 3) No translation available (LFLÄY), 4) Master of Science in Environmental Science (NMILM), 5) Master's Programme in Organic and Medicinal Chemistry (N2KEL), 6) Medicinal Chemistry (NLKEM), 7) Bachelor of Science Programme in Medicinal Chemistry (N1LMK), 8) Master's Programme in Chemistry (N2KEM), 9) Teacher Training Programme (L1LÄR), 10) Bachelor of Science Programme in Chemistry (N1KEM) and 11) Atmospheric Science, Master's Programme (N2ATM)

Main field of studies

Chemistry

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

For admission to the course is required passed on one of the following courses: KEM050 Inorganic Chemistry (15 credits), KEM040 Physical Chemistry (15 credits) or

KEM070 Analytical Chemistry 1 (15 credits), or the equivalent knowledge.

Learning outcomes

After completion of the course, the student should be able to:

Knowledge and understanding

- explain basic definitions and concepts regarding aerosols
- explain occurrence, emission, transformation, chemistry, transport and deposit of atmospheric aerosol
- at a general level explain aerosols influence on air quality and environment,
- present aerosols importance for society and industry including health impact and industrial applications
- fundamentally explain physical and chemical methods of measurement for aerosol.

Competence and skills

- calculate physical properties and movement of aerosol particles
- use modern instrumentation to carry out simple experiments concerning aerosols
- independently utilise, systematise and communicate research results from aerosol scientific studies.

Judgement and approach

- critically review and interpret the results of own experiments.

Course content

The course gives deep knowledge of airborne particles. Aerosols influence our daily life in many ways, everything from their effect on the greenhouse effect to the quality of the air we spirit. Aerosols has an increasing importance for both society and industry and is crucial for production of nanoparticles and other future technology. In the course, basic properties of aerosols are treated, current measuring techniques, environmental effects as well as industrial applications.

The following fields are brought up:

1. Chemical and physical properties of aerosols
2. Natural and anthropogenic particle emissions
3. The importance of airborne particles for chemical reactions in atmospheric transformation and deposition of particles

4. Transformation of gaseous subjects to particles
5. Formation of particles at combustion and industrial processes
6. Environment and health effects
7. Technology for concentration's and size measurements
8. Chemical categorisation
9. Industrial and medical applications

Sub-courses

- 1. Theory (*Teori*), 7.5 credits**
Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)
- 2. Laboratory exercises and miniproject (*Laborationer och miniprojekt*), 7.5 credits**
Grading scale: Pass (G) and Fail (U)

Form of teaching

Part 1: Teaching includes lectures and calculation exercises.

Part 2: The teaching includes laboratory sessions and a miniproject, including written and oral presentations. All components in the module are compulsory.

Language of instruction: English and Swedish

Course is given as principal rule in Swedish but can give completely or partly in English if circumstances requires this. Course literature in English can be involved.

Assessment

Part 1: The examination is done by a written in-class examination at the end of the course.

Part 2: Examination takes place through written and oral presentations.

Student who has not become passed the regular examination session is offered additional examination sessions.

If a student who has failed the same part of the examination twice wishes to change examiner before the next examination a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons against (Chapter 6, Section 22 of Higher Education Regulation).

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

Part 1: The grade is decided by the result of written examination.

Part 2: For grade Pass, passed results of all presentations are required.

Final grade: For grade Pass in the whole course, grade Pass in both is required modules. For grade of Pass with distinction in the whole course, grade of Pass with distinction on module 1 and grade of Pass on module 2 are required.

Regarding application of the ECTS scale for grade it is referred to Vice-Chancellor's decision 28/05/2007, diary nr G 8 1976/07.

Course evaluation

A course evaluation is done in relation to the intended learning outcomes and content of the course. It is performed at the end of the course through an individual written questionnaire on the virtual learning environment at University of Gothenburg. A student who participates in or has completed a course should be given possibility to anonymously express experiences of and views in the course in a course evaluation. A compilation of the course evaluation and reflections of the course coordinator should be made available for the students within reasonable time after the end of the course.