Analytical Chemistry for Medical Applications

Programme course

6.0 credits

Analytisk kemi med medicinska applikationer

8BKG35

Valid from: 2019 Autumn semester

Determined by
The Board for First and Second Cycle Programmes at the Faculty of Medicine and Health Sciences

Date determined
2018-09-04

Main field of study
Chemistry

Course level
First cycle

Advancement level
G1X

Course offered for
- Bachelor´s Programme in Experimental and Industrial Biomedicine

Entry requirements
General entry requirements for undergraduate studies
and
English corresponding to the level of English in Swedish upper secondary education (English 6)
And
Chemistry, Mathematics and Biology corresponding to the level in Swedish upper secondary education (Chemistry 2, Mathematic 4 and Biology 2)
Exemption from Swedish 3

Intended learning outcomes

Knowledge and understanding
On completion of the course, the student shall be able to:

- Describe basic terms and concepts within spectrometry and analytical separation techniques such as chromatography and capillary electrophoresis.
- Describe the construction principles of instruments used in spectrometric analysis and separation.
- Explain the chemical principle of spectrometric analysis and separation methods.

Skills and abilities
On completion of the course, the student shall be able to:

- Interpret and make qualitative and quantitative assessments of data obtained from spectrometric analyses and analytical separations.

Judgement ability and approach
On completion of the course, the student shall be able to:

- Demonstrate a critical approach to searching for relevant information about various spectrometric analysis methods and analytical separation methods and their applications within medicine.

Course content

The aim of the course is to provide fundamental knowledge of modern instrumental analysis techniques and how these can be used to identify and quantify chemical compounds in various types of sample. The course encompasses general concepts within analytical chemistry and the theory of chromatographic separation. Techniques included: Gas chromatography (GC), including injection, separation and detection; liquid chromatography (LC) methods such as straight-phase and reversed-phase separation, gel filtration and ion exchange chromatography; capillary electrophoresis; mass spectrometry (MS), including manual and computerised interpretation of mass spectra; molecular absorption spectrometry (UV spectrometry); and molecular fluorescence (spectrofluorometry).
The course encompasses the field analytical chemistry, with a link to medical chemistry.

Teaching and working methods

At the Faculty of Medicine and Health Sciences student centred and problem based learning make up the foundation of the teaching. The student takes responsibility for, studies and researches current content of the courses and study programme. The methods of the course work challenge the students to independently formulate questions for learning, to seek knowledge and in dialogue with others judge and evaluate achieved knowledge. Students in the Bachelor's programme in Experimental and Industrial Biomedicine work together in groups based on reality based and course related biomedical issues to apply their knowledges, develop their own learning, contribute to the fellow students' learning and to practice cooperation. Throughout the study programme theory is integrated with practical modules. The course methods and integration modules stimulates and support the student's ability to apply their knowledge and professional competence.
Work methods used in this course are lectures, lessons, seminars and laboratory sessions.

Examination

The form of examination is an individual written examination. In addition, active and approved participation in compulsory course elements is required in order to pass the course. Compulsory course elements include laboratory sessions, reports and written assignments.
The written examination may be performed an unlimited number of times by those students who have not achieved a passing grade.
Point of time for retake examination must normally be announced no later than the time of the regular examination. The extent of the retake examination must be the same as the regular examination.

CHANGE OF EXAMINER

A student who has obtained a failing grade twice for a course or a part of a course is, after request, entitled to be appointed another examiner, unless there are special reasons to the contrary.

APPLICATION FOR EXAMINATION / WRITTEN EXAM

Instructions on how to apply for examinations are given prior to the beginning of each course.

Grades

Four-grade scale, digits, U, 3, 4, 5

Course literature

A literature reference list must be set no later than two months before the course begins by the programme committee for the Bachelor's Programme in Experimental and Industrial Biomedicine. There is no compulsory course literature.

Other information

Planning and implementation of the course is to be based on the wordings in the course syllabus. A course evaluation is compulsory for each course and should include how the course is in agreement with the course syllabus. The course coordinator will analyse the course evaluation and propose appropriate development of the course. The analysis and proposal will be returned to the students, the Director of Studies, and as needed to the Education Board, if related to general development and improvement.
The course is carried out in such a way that knowledge of gender, gender identity/expression, ethnicity, religion or other belief system, disability, sexual orientation and age is addressed, highlighted and communicated as part of the programme.
If the course is cancelled or undergoes major changes, examination is normally offered under this course syllabus, at a total of three occasions, within/in connection to the two following semesters, of which one in close proximity to the first examination.

Department

Institutionen för fysik, kemi och biologi