

Course description

Course abbreviation: KCH/SAM
Course name: Analytical Separation Methods
Academic Year: 2016/2017

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Department/Unit /	KCH / SAM	Academic Year	2016/2017
Title	Analytical Separation Methods	Type of completion	Exam
Accredited/Credits	Yes, 5 Cred.	Type of completion	
Number of hours	Lecture 2 [Hours/Week] Seminar 1 [Hours/Week]	Course credit prior to	NO
Occ/max	Status A Status B Status C	Counted into average	YES
Summer semester	0 / 0 0 / 0 0 / 0	Min. (B+C) students	not determined
Winter semester	10 / - 0 / 0 0 / 1	Repeated registration	NO
Timetable	Yes	Semester taught	Winter semester
Language of instruction	Czech		
Substituted course	None		
Preclusive courses	N/A		
Prerequisite	N/A		
Informally recommended courses	N/A		
Courses depending on this Course	N/A		

Course objectives:

Theoretical bases of separation processes, chromatographic and electromigration methods, basic principles of chiral separation

Requirements on student

Test in the range of presented topics include written test and oral examination.

Evaluation of the subject as well as the exam grading is made according to the articles No 31 - 33 in the Regulations on Study and Examinations University of Ostrava

Content

1. Introduction, literature. Basic principles of the analytical separations.
2. The separation methods - precipitation, extraction. membrane separations.
3. Chromatography - principles and theoretical bases (thermodynamic and kinetic theory), van Deemter equation. Techniques.
4. Chromatography - flat bed techniques.
5. Gas chromatography - principle, techniques, instrumentation. Application.
6. High performance liquid chromatography (HPLC) - principle, techniques, instrumentation. Application.
7. Ion chromatography - principle, instrumentation, application.
8. Affinity chromatography, chromatography with supercritical liquids.
9. Electromigration separation methods - flat bed and capillary. principles.
10. Electrophoresis, isotachopheresis - instrumentation, application
11. Bases and principles of chiral separations, techniques, application.
12. Mass spectrometry - principle, instrumentation, analyzers.
13. Mass spectrometry coupling with other separation methods.

Seminar trains qualitative and quantitative evaluation of chromatograms.

Prerequisites - other information about course preconditions

none

Competences acquired

obtaining of knowledge of separation analytical methods principles
 orientation in the practical use of separation methods
 obtaining of computations in the field of separation methods

Studijní opory

Guarantors and lecturers

- **Guarantors:** doc. Ing. Zuzana Navrátilová, CSc.
- **Lecturer:** doc. Ing. Zuzana Navrátilová, CSc.
- **Seminar lecturer:** doc. Ing. Zuzana Navrátilová, CSc.

Literature

- **Recommended:** K. Štulík a kol. *Analytické separační metody*. Karolinum UK Praha, 2004.

Time requirements

Activities	Time requirements for activity [h]
Being present in classes	39
Scientific text studying in the Czech language	20
Self-tutoring	25
Preparation for an exam	35
Consultation of work with the teacher/tutor (incl. electronic)	6
Total:	125

assessment methods

professional knowledge

Oral examination

prerequisite

professional knowledge

none

teaching methods

professional knowledge

Dialogic (discussion, dialogue, brainstorming)

Monologic (explanation, lecture, briefing)

learning outcomes

professional knowledge

obtaining of knowledge of separation analytical methods principles

orientation in the practical use of separation methods

obtaining of computations in the field of separation methods

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Chemistry	Postgraduate Master	Full-time	Analytical Chemistry of Solid Phase	1	2013	2016	Povinné předměty	A	1	ZS