Course Unit Descriptor

Study Programme: Chemistry

Course Unit Title: Advanced Analytical Chemistry

Course Unit Code: DSH-606

Name of Lecturer(s): Full professor Slobodan Gadžurić; Full professor Đenđi Vaštag

Type and Level of Studies: PhD Studies

Course Status (compulsory/elective): Elective

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 15

Prerequisites: None

Course Aims:

- Expanding the previously acquired knowledge on acid-base equilibria in aqueous and non-aqueous systems.
- Introducing students to interactions in multicomponent homogenous systems.
- Enabling students to apply their knowledge in analytical and separation procedures.
- Enabling students for independent solving of complex analytical problems related analysis of unknown sample.
- Enabling students to apply mathematical and data processing methods in analytical chemistry.

Learning Outcomes:

- List and explain interactions in multicomponent homogenous equilibria;
- Solve analytical problems related to different homogeneous equilibria processes in solutions;
- Apply mathematical equations and computer statistical programs in expression of analytical results;
- Adequately operate instruments in analysis of an unknown sample.

Syllabus:

Theory

Ionic equilibria in solutions. Acid-base equilibrium. Acid-base equilibrium constant determination. Redox processes. Redox titrations. Complex formations. Complex formation function. Concentration distribution. Heterogeneous equilibria. Chromatography. Extraction. Ion-exchange processes. Non-aqueous solutions. Separation methods in analytical chemistry. Analytical methods. Statistical data evaluation in analytical chemistry.

Other forms of teaching

Review of the literature. Project preparation.

Required Reading:

1. D. C. Harris: Quantitative Chemical Analysis, W. H. Freeman and Company, 2003.
2. J. N. Butler and D. R. Cogley: Ionic equilibrium: solubility and pH calculations, Wiley-Interscience, 1998.

Weekly Contact Hours: 150	**Lectures:** 75	**Practical work:** 75

Teaching Methods:

Independent student work, practical problem solving

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points
Seminar work	30	Oral exam	70