

Course Unit Descriptor

Study Programme: Food Engineering, Pharmaceutical Engineering, Biotechnology, Materials Engineering, Chemical Engineering
Course Unit Title: Analytical Chemistry
Course Unit Code: O2Z03
Name of Lecturer(s): Full Professor Radomir Malbaša, Associate Professor Jasmina Vitas
Type and Level of Studies: Bachelor Academic Degree
Course Status (compulsory/elective): Compulsory
Semester (winter/summer): Summer
Language of instruction: English
Mode of course unit delivery (face-to-face/distance learning): Face-to-face
Number of ECTS Allocated: 7
Prerequisites: None
Course Aims: Acquisition of basic scientific and academic skills and skills for applying the principles and methods of classical analytical chemistry, both from theoretical and practical aspects.
Learning Outcomes: Understanding the principles and significance of methods of classical analytical chemistry, the possibility of their application in different fields of analysis, as well as the overcoming of stoichiometric calculations related to chemical reactions that are basically applied to certain methods of analysis.
Syllabus: <i>Theory</i> The subject of the study of analytical chemistry. Basics of qualitative analysis. Chemistry of aqueous solutions. Basics of quantitative chemical analysis. Quantitative chemical analysis - gravimetry. Application of the formation of precipitates in gravimetry. Quantitative chemical analysis - volumetry (titrimetry). Acid-base titrations. Calculation the pH before starting the titration, during titration and at the equivalence point. Precipitation titrations. Complexometric titrations. Redox titrations. Permanganometry. Iodimetric titrations. Evaluating the results of the analysis and the method. Preparation of the sample for analysis. Analysis of real samples. <i>Practice</i> Laboratory practice: characteristic reactions in qualitative analysis; spot test analysis; analysis of real samples and model systems by gravimetric and volumetric methods, which are studied in theoretical teaching; stoichiometric calculations.
Required Reading: 1. Harvey, D. (2000): Modern Analytical Chemistry, ISBN: 0-07-237547-7, McGrawHill. 2. Lončar, E. (2013): Analytical Chemistry-Textbook, ISBN: 978-86-6253-024-0, University of Novi Sad, Faculty of Technology Novi Sad (in Serbian). 3. Malbaša, R., Vitas, J. (2020): Analytical Chemistry-Book of Problems, ISBN: 978-86-6253-112-4, University of Novi Sad, Faculty of Technology Novi Sad (in Serbian). 4. Kolarov, Lj, Lončar, E. (1995): A Qualitative Semi-Micro Chemical Analysis, Practicum, ISBN: 86-80995-05-3, University of Novi Sad, Faculty of Technology Novi Sad (in Serbian). 5. Malbaša, R., Vitas, J., Vukmanović, S. (2021): Analytical Chemistry, Practicum with Workbook, ISBN: 978-86-6523-

124-7, University of Novi Sad, Faculty of Technology Novi Sad (in Serbian).

Weekly Contact Hours: 6

Lectures: 3

Practical work: 3

Teaching Methods:

Interactive lectures using video presentations, individual laboratory practice, consultations.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	
Practical work	15	oral exam	30
Preliminary exam(s)	50		
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.