Course Unit Descriptor

Study Programme: Chemistry

Course Unit Title: Chromatographic Methods

Course Unit Code: IHA-413

Name of Lecturer(s): Associate professor Daniela Šojić-Merkulov

Type and Level of Studies: Bachelor Academic Studies

Course Status (compulsory/elective): Elective

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: 6

Prerequisites: None

Learning objectives

The goal of the course is expanding the theoretical and practical knowledge and understanding in the field of chromatography, as one of the most modern analytical separation techniques. In the lectures, as well as through practical training, students will deepen the knowledge related to the most important theoretical principles of chromatographic methods, which will enable them to select, implement and optimize a chromatographic separation technique in their future work.

Learning outcomes

Upon successful completion of this course, the student is able to:

- understand the importance and notice the difference between different modes of chromatographic separation,
- apply knowledge of qualitative and quantitative analysis in various fields of chemical industry, pharmaceutical industry, the environment and other analytics,
- demonstrate the independence of the appropriate optimization of chromatographic systems,
- apply knowledge in solving specific problems by using the appropriate analytical chromatographic techniques (gas, liquid, ion-pair chromatography, molecular sieves, affinity, supercritical fluid and planar chromatography) and
- clearly and accurately analyze and interpret the results of chromatographic analysis.

Syllabus

Theoretical instruction

Introduction to Chromatography. Definitions and classification method of separation. Optimization of chromatographic systems. Comparison of chromatographic techniques. Qualitative and quantitative analysis. Liquid chromatography. Planar chromatography. Stationary phase. Mobile phase. Apparatus and procedures. Ion-exchange chromatography. High performance ion chromatography. Chromatography seeding. Affinity chromatography. Coupled chromatographic techniques. Special techniques.

Practical instruction

Application of chromatographic techniques for the qualitative and quantitative analysis in various fields of chemical industry, pharmaceutical industry, the environment and other analytics. Solve certain problems by using appropriate analytical chromatographic techniques.

Required Reading:

1. J. M. Miller, Chromatography - Concepts and Contrast, John Wiley, 2005.

Weekly Contact Hours: 75	**Lectures:** 30	**Practical work:** 15+30

Teaching Methods:

Lectures and literature search

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points
Activities	5	Written exam	20
Lab excersises	25	Oral exam	20
Seminar work	30		