Study Programme: Master Academic Studies in Chemistry

Course Unit Title: Photochemistry with chemical kinetics

Course Unit Code: IHN-503

Name of Lecturer(s): Assistant professor Vesna Despotović

Type and Level of Studies: Master of Science Degree

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: 6

Prerequisites: None

Course Aims:

- To provide the adoption of wide theoretical and practical knowledge of major photochemical laws and phenomena.
- To offer information on the most important aspects of the application of photochemical and photophysical principles and kinetic principles in various fields of application, such as environmental protection, solar energy conversion, etc.
- To enable students to successfully perform experiments in the field of photo-chemistry and kinetics by adopting an appropriate methodology.

Learning Outcomes:

After successfully completing the course, the student is able to:

- show and defines more important photochemical concepts and laws and illustrates their application in the environment
- demonstrates the adopted theoretical knowledge and understanding of kinetic laws, concepts and principles when solving photochemical problems
- successfully applies the appropriate methodology in experimental work with the application of photo-chemical effects
- independently process experimental results and calculate the characteristic parameters of photochemical processes.

Syllabus:

Theory

Selected topics in the following areas: basic photochemical principles and laws, photochemical transformations in the atmosphere, photocatalysis and photosynthesis, transformation of solar energy into electrical energy in photoelectrochemical cells, application of photocatalytic reactions in chemical treatment of wastewater, drinking water and other materials, characteristic examples of reactions in gas and liquid state. Furthermore, the catalyst and catalyst design basis, the modern instrumental method for monitoring the complexity of chemical reaction kinetics, and the processing of experimental results to determine the kinetic parameters and the reaction mechanism.

Practice

Determination of basic kinetic parameters of photochemical processes on model solutions. Application of photocatalytic reactions in water purification. Application of different instrumental methods for monitoring the flow of reactions in the solution.

Required Reading:

V. Ramamurthy, K. Schanze, *Semiconductor Photochemistry and Photophysics*, New York, 2003

Weekly Contact Hours:	**Lectures:** 3	**Practical work:** 2

Teaching Methods:

Lectures, laboratory work, seminar

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	**Final exam**	points

Active class participation	10	written exam	20
Practical work	10	oral exam	40
Seminar(s)	20		