УНИВЕРЗИТЕТ У БАЊОЈ ЛУЦИ
UNIVERSITY OF BANJA LUKA
ПРИРОДНО-МАТЕМАТИЧКИ ФАКУЛТЕТ
FACULTY OF NATURAL SCIENCES AND MATHEMATICS

| CHEMISTRY DEPARTMENT | PhD STUDIES |
|---|---|

| **Course name** | **Modern Electrochemical Methods for Water Purification** | | | |
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| **Course code** | **Course status** | **Semester** | **Hours of instruction** | **ECTS** |
| **DHEM23SEM** | **elective** | **I or III** | **5+0** | **10** |
| **Teacher(s)** | **Prof. Dragan Manojlović, PhD** | | | |

| **Prerequisite course(s)** | **Entry requirements** |
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**Course goals**

The course provides students with an overview of the basics of advanced oxidation processes (AOP) and primarily relates to electrochemical methods for water purification. During the course, special attention will be paid to electrochemical advanced oxidation processes (EAOP).

**Learning outcomes**

Students acquire skills for understanding the theoretical and practical postulates of electrochemical methods for water purification as well as the possibility of their application in specific real-time problems.

**Course content**

1. The problem of water pollution, modern electrochemical methods for water purification, and monitoring the effectiveness of treatment
2. Classical electrochemical methods for water purification (electrode ionization, electrodialysis, electrocoagulation, electroflotation ...)
3. Process of electrochemical oxidation and reduction (direct and indirect methods)
4. EAOP Electrochemically advanced oxidation processes (electro-Fenton process (EF) process, photoelectro-Fenton process, solar photoelectro-Fenton, sonoelectron-Fenton)
5. Microbial electrochemical technologies for wastewater treatment
6. Electrochemical degradation of textile dyes, pesticides, and pharmaceuticals
7. Electrochemical removal of reactive textile dyes using highly porous carbon electrodes

**Teaching methods**

Lectures, experimental work

**Books and other learning materials**

Electro-Fenton Process, Editors: Minghua Zhou, Mehmet A. Oturan, Ignasi Sirés, Springer, 2018.
Electrochemistry for the Environment, Editors, Christos Comninellis, Guohua Chen, Springer, 2010.

The latest scientific papers published in international journals

**Course activities and grading method**

Experimental work, final exam

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| **Attendance** | **10** | | |
| **Research work** | **30** | **Final exam** | **60** |

**Additional course notes**

| **Name of the teacher who prepared this form** | Prof. Dragan Manojlović, PhD |
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