



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



CHEMISTRY DEPARTMENT

PhD STUDIES

Course name	<b>Chemical Sensors and Biosensors</b>			
Course code	Course status	Semester	Hours of instruction	ECTS
DHEM23HSB	elective	I, II, III or IV	5+0	10
Teacher(s)	<b>Prof. Neso Sojic, PhD and Prof. Dragan Manojlović, PhD</b>			

Prerequisite course(s)	Entry requirements
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#### Course goals

The aim of this course is to expand the knowledge in the field of chemical sensors and biosensors. Students will complete their knowledge related to the types and construction of sensors, as well as the types of transducer elements. Micro, ultramicro, and nanosensors will be studied as a special area in this course. The practical application of sensors and biosensors in biochemistry and environmental chemistry will be one of the main focuses.

#### Learning outcomes

After this course, the student will be qualified for independent and team research work, development, and optimization of new types of sensors, biosensors, and their practical application in various fields of chemistry.

#### Course content

1. Introduction and types of biosensors
2. Sensor elements
3. Converters
4. Identifying elements
5. Sensitivity and selectivity
6. Electrochemical sensors and biosensors
7. Potentiometric sensors and biosensors
8. Amperometric sensors and biosensors
9. Conductometric sensors and biosensors
10. Optical sensors and biosensors
11. Calorimetric sensors and biosensors
12. Piezo sensors
13. Acoustic Sensors
14. Micro, ultramicro and nanosensors
15. Specific application in biochemistry
16. Specific applications in environmental chemistry

#### Teaching methods

Lectures and seminary work

#### Books and other learning materials

*Main coursebooks:* B. Eggins: Chemical sensors and biosensors, Wiley, 2006.

*Supplementary coursebooks:* A. J. Bard, L. R. Faulkner: Electrochemical methods - Fundamentals and applications, Wiley, 2000.

– H. Girault: Analytical and physical electrochemistry, EPEL Press, 2004.

#### Course activities and grading method

Seminary work, study research work, final exam

Class attendance	5	Study research work	15
Seminary work	20	Final exam	60

#### Additional course notes

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