



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



CHEMISTRY DEPARTMENT

FIRST CYCLE OF STUDY

Chemistry/Chemistry Education

Coursecode	<b>Nuclear Chemistry</b>			
Course code	Course status	Semester	Hours of instruction	ECTS
1C16HOS1131	elective	VIII	3+3	6
Teacher(s)	<b>Prof. Saša Zeljković PhD</b>			

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

The goal is for students to get acquainted with the basic concepts of nuclear chemistry and the laws of spontaneous and artificially induced nuclear processes. Additionally students should understand the effects of ionizing radiation (radioactivity) on humans.

**Learning outcomes**

Students understand the connection between the structure of the atomic nucleus and its stability, and the appearance of radioactivity. Understand and know how to describe and apply the laws of nuclear reactions. They know the methods of ionizing radiation detection and measurement.

**Course content**

Major stages in the radioactivity idea development, nuclear chemistry and nuclear physics. Atomic nucleus. Fundamental forces. Elementary particles. Nucleus stability and the periodic table.

Mass defect and atomic nucleus binding energy. Nuclear reactions. Nuclear fission and nuclear fusion. Radioactive decay with a change in the structure of the atomic nucleus. Law of radioactive displacement. Natural radioelements. Transuranic elements. Artificial nuclear reactions. Radioactive isotopes. Detection of ionizing radiation. Nuclear chain reactions and energy production. Nuclear fission, nuclear reactors and the atomic bomb. Nuclear fusion and hydrogen bomb. Effect of ionizing radiation on humans.

Computational exercises.

**Teaching methods**

Lectures and computational exercises

**Books and other learning materials**

M. Haisinski: **Nuclear chemistry and its applications** (in Serbian), Naucna knjiga, Belgrade, 2015.; Š. Miljanić: **Nuclear Chemistry-Script** (in Serbian), Faculty of Physical Chemistry, Belgrade, 2008.; S. Zeljković and J. Penavin Škundrić: **Selected Chapters in Inorganic Chemistry** (in Serbian), University of Banja Luka, Banja Luka, 2015.; I. Filipović and S. Lipanović: **General and inorganic chemistry** (in Serbian), parts I and II, Školska knjiga, Zagreb. 1995.

**Course activities and grading method**

The colloquium and the activity refer to the exercises and are a condition for taking the final exam. Tests: two per semester. The first including the material from the major stages in the radioactivity idea development to the law of radioactive displacement (including law of radioactive displacement). Others including the materials from natural radioelements to the effects of ionizing radiation on humans. The results of these tests are included in the final grade only if they exceed 50% of the points provided for a given form of test during the semester.

Colloquium and activity	10	Test 2	15
Test 1	15	Final exam	60

**Additional course notes**

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Name of the teacher who prepared this form	Saša Zeljković
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