



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



CHEMISTRY DEPARTMENT

FIRST CYCLE OF STUDY

Chemistry

Course name	Nanochemistry			
Course code	Course status	Semester	Hours of instruction	ECTS
1C16HOS1126	required	VII	3+2	6
Teacher(s)	Assist. Prof Suzana Gotovac Atlagić, PhD			

Prerequisite course(s)	Entry requirements
Physical Chemistry 1 and 2, Analytical Chemistry 1 and 2	Passed exam

Course goals
The aim of the Nanochemistry course is to acquaint students with the procedures for the synthesis of nanomaterials based on classical and modern physico-chemical methods, methods of characterization and testing of the application potential of this class of materials.

Learning outcomes
The student understands the chronology of development of nanochemistry and its dependence on the development of sophisticated instrumental techniques after the 1970s. The student understands the specifics of organic and inorganic nanomaterials and can assess the potential for their application depending on the shape and surface chemistry. Student synthesizes nanomaterials in group work and performs their physical-chemical characterization. Through experimental group work, the student is encouraged to think about domestic raw materials as materials for the development of nanotechnologies based on nanochemical phenomena.

Course content
Synthesis of nanomaterials by microemulsion methods, catalytic growth methods, laser ablation, pyrolysis, spray techniques and lithography. Characterizations of nanomaterials: ultraviolet / visible and infrared spectrometry, specific surface measurement methods, Raman spectrometry, electron microscopy, X-ray techniques. Applications of nanomaterials: catalysts, additives in the food industry, composites with polymers, nanomaterials in medicine, nanomaterials in environmental protection. <i>Experimental exercises:</i> Safety measures during the synthesis and testing of nanomaterials with an emphasis on respiratory protection. Methods of synthesis of metal and organic nanoparticles, methods of introduction of nanoporosity by activation, methods of ion exchange for the purpose of improving porosity, applied testing of nanomaterials.

Teaching methods
Lectures and laboratory exercises

Books and other learning materials
Mihailo Ristić, Maja Katić, Suzana Gotovac-Atlagić, Vukoman Jokanović, Simo Jokanović, Nataša Jović, Vladimir Šamara, Aleksandar Stjepanović, Ferid Softić, Saša Nikolić i <i>Rainer H. Muller: New materials and nanotechnology</i> , Univerzitet u Banjoj Luci, Banja Luka, 2012.

Course activities and grading method
Integral test and final exam based on all of the lecture chapters. Presentation of the seminar project.

Activity	20	Integral test	20
		Final exam	60

Additional course notes
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Name of the teacher who prepared this form	Suzana Gotovac Atlagić
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