



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



CHEMISTRY DEPARTMENT

SECOND CYCLE Master in Chemistry

Course name	Polymer Synthesis and Characterization			
Course code	Course status	Semester	Hours of instruction	ECTS
2C16HEM008	elective	I	3+2	5
Teacher(s)	Prof. Vesna Antić PhD Prof. Milica Balaban PhD			

Prerequisite course(s)		Entry requirements	
/		/	
Course goals			
Students get acquainted in detail with the structure, properties, methods of synthesis and techniques for characterization of synthetic polymers.			
Learning outcomes			
After passing the exam, the student should recognize the different types of synthetic polymers and methods for their preparation. The student should be able to explain kinetic and thermodynamic basics graded and chain reactions for the synthesis of polymers. The student also mastered the knowledge about the structure of polymers, their properties and application. He gained a basic knowledge of the mechanism and kinetics of chain and step polymerization, as well as the mode control molecular weight and molecular weight distribution polymers. The student is able to propose a suitable characterization method for a particular polymer property.			
Course content			
- Types of polymers and polymerization (basic concepts, nomenclature, molar masses and polydispersity). Polymer classification. Determination of the structure and composition of the macromolecular chain. Determination of molar mass and distribution of molar masses. Viscosity. Mechanical properties. - Staged polymerizations. Polycondensation and polyaddition. Mechanism and kinetics of step polymerizations. An overview of the synthesis of some industrially important polymers. - Chain polymerizations (radical, cationic and anionic). Thermodynamic and kinetic aspect of chain polymerizations. Molar masses and distribution of molar masses of polymers obtained by chain polymerizations. - Polymerizations with ring opening. - Copolymerization. Block and alternating copolymers. - Newer synthesis techniques and polymer characterization methods.			
Teaching methods			
Lectures, exercises			
Books and other learning materials			
1. S. M. Jovanović, J. Đonlagić: Chemistry of macromolecules (in Serbian), TMF, Belgrade, 2004. 2. G. Odian: Principles of Polymerization, John Wiley & Sons, New York, 1991. 3. J. Đonlagić: Chemistry of macromolecules – practicum (in Serbian), TMF, Belgrade, 1999. 4. S. Jovanović, K. Jeremić: Characterization of polymers (in Serbian), TMF, Belgrade, 2007. 5. H. G. Elias: An Introduction To Polymer Science, VCH, Weinheim, 1st ed., 1997			
Course activities and grading method			
Tests, two tests per semester. The results of the above 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.			
Tests and activity		40	Final exam
			60
Additional course notes /			
Name of the teacher who prepared this form		Vesna Antić	