



<b>Course ID:</b> HOB304	<b>Course name: CHEMISTRY OF MACROMOLECULES</b>		
<b>Cycle:</b> FIRST	<b>Year: THIRD</b>	<b>Semester: VI</b>	<b>ECTS credits:2</b>
<b>Course status: ELECTIV</b>	<b>Total course hours: 45</b> Lectures: 15 Laboratory: 30		
<b>Teaching participants:</b>	<b>Teachers and associates with expertise in the field to which the subject belongs</b>		
<b>Prerequisite for enrollment:</b>	-		
<b>Course aims:</b>	To familiarize students with the physico-chemical basis of the phenomenon of polymerization. Acquiring knowledge of synthetic and natural macromolecules. Students will be given a detailed overview of the importance of the basic structure of the polymer chains, conformation, configuration, morphology, schedules chains in the solid state, and crystallinity of the polymer.		
<b>Thematic course units:</b>	<ol style="list-style-type: none"><li>1. The definition of the polymer. Types of macromolecules in inorganic, organic chemistry, biochemistry and physiology.</li><li>2. Natural and synthetic polymers.</li><li>3. The fundamental structure of the polymer chain, the molecular weight and molecular weight distribution.</li><li>4. Polymerization, stepwise polymerization, chain polymerization and copolymerization, polymerization kinetics and statistics. Dependency chain structure and molecular weight of the polymerization conditions.</li><li>5. Polymer structure, conformation and chain configuration, the morphology of the polymer, the molecular arrangement of the solid state, the crystallinity of the polymer.</li><li>6. Diffraction methods for determination of crystal structures.</li><li>7. Amorphous polymers, phase transitions, glass transition temperature, viscoelasticity.</li><li>8. The influence of the structure, orientation and dynamics of the properties of the polymer chain. Polymer solution, the solubility of the polymer, the conformation of macromolecules in solution, the Flory-Huggins theory.</li><li>9. New polymeric materials.</li><li>10. Analysis of the microstructure and morphology of the polymer (spectroscopic).</li></ol>		
<b>Learning outcomes:</b>	Knowledge: Acquisition of knowledge about synthetic and natural macromolecules Skills: Students will gain basic knowledge of the mechanism and procedures of synthesis		

	Competencies: To give students a detailed overview of the importance of basic structures of polymer chains, conformation, configuration, morphology, arrangement of solid state chains and polymer crystallinity		
<b>Teaching methodology:</b>	Auditory lectures, laboratory exercises		
<b>Assessment methods and grading system<sup>1</sup>:</b>	<b>Grading criteria</b>		
	Criteria	Maximal score	Required score
	1. Class attendance	5	3
	2. Class activities	10	5
	3. Midterms	45	25
	4. Final exam	40	22
	Total	100	55
	<b>Scores and grading</b>		
	Score	Grade (BiH)	Grade (ECTS)
	< 55	5	F, FX
	55–64	6	E
65–74	7	D	
75–84	8	C	
85–94	9	B	
95–100	10	A	
<b>Literature<sup>2</sup>:</b>	<p>Mandatory literature:</p> <ol style="list-style-type: none"> <li>Munk, P., Aminabhavi, T.M. (2002) Introduction to Macromolecular Science. 2<sup>nd</sup> ed., Wiley-Interscience, New York</li> <li>Ćirić-Marjanović, G. (2015) Fizička hemija makromolekula, Fakultet za fizičku hemiju, Univerzitet u Beogradu</li> <li>Iličković, Z., Ademović, Z., Suljagić, J. (2017) POLIMERI I POLIMERIZACIJSKI PROCESI-Teorijske osnove sa praktikumom, In Scan, Tuzla</li> <li>Tahirović, I., Klepo, L., Toromanović, J. (2018) Praktikum iz hemije makromolekula, PMF, Sarajevo</li> </ol> <p>Supplementary literature:</p> <ol style="list-style-type: none"> <li>Sun S.F. (1994) Physical Chemistry of Macromolecules. 1<sup>st</sup> ed., John Wiley &amp; Sons, Inc., New York, Chichester, Brisbane, Toronto, Singapore</li> <li>Janović Z (1997) Polimerizacije i polimeri, Hrvatsko društvo kemijskih inženjera i tehničara, Zagreb</li> <li>Tonelli AE, Srinivasarao M (2001) Polymers from the Inside out (An Introduction to Macromolecules) Wiley, New York</li> <li>Chang, R., (2005) Physical chemistry for the Biosciences. <i>Williams College</i>. University Science Books, Sausalito, California; str. 599-635.</li> </ol>		

<sup>1</sup>The grading structure for each subject is determined by the Council of the organizational unit before the beginning of the academic year in which the subject is taught as per Article 64, paragraph 6 of the Law on Higher Education of Sarajevo Canton

<sup>2</sup>The Senate of the higher education institution, as an institution, or the Council of the organizational unit of the higher education institution, as a public institution, determines by a special decision, which is published on its website before the beginning of the academic year obligatory, mandatory and recommended textbooks and manuals, as well as other recommended literature based on which exams are prepared and taken as per Article 56, paragraph 3 of the Law on Higher Education of the Sarajevo Canton