



Course ID: HOB364	Course name: CHEMISTRY OF MACROMOLECULES		
Cycle: FIRST	Year: THIRD	Semester: VI	ECTS credits:2
Course status: MANDATORY	Total course hours: 45 Lectures: 15 Laboratory: 30		
Teaching participants:	Teachers and associates with expertise in the field to which the subject belongs		
Prerequisite for enrollment:	-		
Course aims:	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.		
Thematic course units:	<ol style="list-style-type: none">1. The definition of the polymer. Types of macromolecules in inorganic, organic chemistry, biochemistry and physiology.2. Natural and synthetic polymers.3. The fundamental structure of the polymer chain, the molecular weight and molecular weight distribution.4. Polymerization, stepwise polymerization, chain polymerization and copolymerization, polymerization kinetics and statistics. Dependency chain structure and molecular weight of the polymerization conditions.5. Polymer structure, conformation and chain configuration, the morphology of the polymer, the molecular arrangement of the solid state, the crystallinity of the polymer.6. Diffraction methods for determination of crystal structures.7. Amorphous polymers, phase transitions, glass transition temperature, viscoelasticity.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.9. New polymeric materials.10. Analysis of the microstructure and morphology of the polymer (spectroscopic).		
Learning outcomes:	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																																													
Teaching methodology:	Auditory lectures, laboratory exercises																																													
Assessment methods and grading system¹:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #d3d3d3;"> <th colspan="3">Grading criteria</th> </tr> <tr> <th style="text-align: center;">Criteria</th> <th style="text-align: center;">Maximal score</th> <th style="text-align: center;">Required score</th> </tr> </thead> <tbody> <tr> <td>1. Class attendance</td> <td style="text-align: center;">5</td> <td style="text-align: center;">3</td> </tr> <tr> <td>2. Class activities</td> <td style="text-align: center;">10</td> <td style="text-align: center;">5</td> </tr> <tr> <td>3. Midterms</td> <td style="text-align: center;">45</td> <td style="text-align: center;">25</td> </tr> <tr> <td>4. Final exam</td> <td style="text-align: center;">40</td> <td style="text-align: center;">22</td> </tr> <tr> <td style="text-align: center;">Total</td> <td style="text-align: center;">100</td> <td style="text-align: center;">55</td> </tr> <tr style="background-color: #d3d3d3;"> <th colspan="3">Scores and grading</th> </tr> <tr> <th style="text-align: center;">Score</th> <th style="text-align: center;">Grade (BiH)</th> <th style="text-align: center;">Grade (ECTS)</th> </tr> <tr> <td style="text-align: center;">< 55</td> <td style="text-align: center;">5</td> <td style="text-align: center;">F, FX</td> </tr> <tr> <td style="text-align: center;">55–64</td> <td style="text-align: center;">6</td> <td style="text-align: center;">E</td> </tr> <tr> <td style="text-align: center;">65–74</td> <td style="text-align: center;">7</td> <td style="text-align: center;">D</td> </tr> <tr> <td style="text-align: center;">75–84</td> <td style="text-align: center;">8</td> <td style="text-align: center;">C</td> </tr> <tr> <td style="text-align: center;">85–94</td> <td style="text-align: center;">9</td> <td style="text-align: center;">B</td> </tr> <tr> <td style="text-align: center;">95–100</td> <td style="text-align: center;">10</td> <td style="text-align: center;">A</td> </tr> </tbody> </table>	Grading criteria			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	Scores and grading			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
Grading criteria																																														
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																																												
Scores and grading																																														
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																																												
Literature²:	<p>Mandatory literature:</p> <ol style="list-style-type: none"> Munk, P., Aminabhavi, T.M. (2002) Introduction to Macromolecular Science. 2nd ed., Wiley-Interscience, New York Ćirić-Marjanović, G. (2015) Fizička hemija makromolekula, Fakultet za fizičku hemiju, Univerzitet u Beogradu Iličković, Z., Ademović, Z., Suljagić, J. (2017) POLIMERI I POLIMERIZACIJSKI PROCESI- Teorijske osnove sa praktikumom, In Scan, Tuzla Tahirović, I., Klepo, L., Toromanović, J. (2018) Praktikum iz hemije makromolekula, PMF, Sarajevo <p>Supplementary literature:</p> <ol style="list-style-type: none"> Sun S.F. (1994) Physical Chemistry of Macromolecules. 1st ed., John Wiley & Sons, Inc., New York, Chichester, Brisbane, Toronto, Singapore Janović Z (1997) Polimerizacije i polimeri, Hrvatsko društvo kemijskih inženjera i tehničara, Zagreb Tonelli AE, Srinivasarao M (2001) Polymers from the Inside out (An Introduction to Macromolecules) Wiley, New York Chang, R., (2005) Physical chemistry for the Biosciences. <i>Williams College</i>. University Science Books, Sausalito, California; str. 599-635. 																																													

¹The 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

²The 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