



Course ID: HNM353	Course name: DEMONSTRATION EXPERIMENTS IN CHEMISTRY I		
Cycle: FIRST	Year: THIRD	Semester: V	ECTS credits: 7
Course status: MANDATORY		Total course hours: 105 Lectures: 30 Laboratory: 75	
Teaching participants:	Teachers and associates with expertise in the field to which the subject belongs		
Prerequisite for enrollment:	-		
Course aims:	Developing the awareness about the importance of demonstration experiments in process of acquiring knowledge in chemistry. Enabling students to demonstrate chemical concepts from different areas of chemistry and their interpretation on three levels of representation		
Thematic course units:	<ol style="list-style-type: none">1. Experiment: the basis for learning chemistry2. The experiment in chemistry throughout history3. Demonstration experiments4. Presentation of experiments in chemistry teaching5. Three levels of representation in chemistry teaching6. Gases in the school laboratory. Handling gases.7. Liquids and solids in school laboratory. Handling liquids and solids8. Chemicals: classification and proper storage9. Standards for designing and equipping the middle- and high-school laboratory10. Precautions when experimenting in chemistry teaching. Safety of teachers and students.11. Proper disposal of the product of an experiment12. Misconceptions in chemistry13. Particle drawings in chemistry teaching		
Learning outcomes:	Knowledge: <ul style="list-style-type: none">• Choose appropriate experiment for middle and high school chemistry instruction• Describe three levels of representation in chemistry teaching and present them with the Johnstone triangle Skills: <ul style="list-style-type: none">• Adapt chemistry experiments for middle and high school students in different classroom conditions.		

	<ul style="list-style-type: none"> • Demonstrate proper handling of gases, liquids and solids when performing experiments in chemistry; <p>Competences:</p> <ul style="list-style-type: none"> • Apply safety rules in performing experiments and in handling hazardous chemicals • Apply guidelines for storing and handling chemicals in school chemistry classroom; • Give recommendations for proper disposal of chemicals in school environment. 																																													
Teaching methodology:	<p>Oral presentation Discussion Research Practical exercises</p>																																													
Assessment methods and grading system¹:	<table border="1"> <thead> <tr> <th colspan="3">Grading criteria</th> </tr> <tr> <th>Criteria</th> <th>Maximal score</th> <th>Required score</th> </tr> </thead> <tbody> <tr> <td>1. Class attendance</td> <td>5</td> <td>3</td> </tr> <tr> <td>2. Class activities</td> <td>15</td> <td>8</td> </tr> <tr> <td>3. Midterm</td> <td>40</td> <td>22</td> </tr> <tr> <td>4. Final exam</td> <td>40</td> <td>22</td> </tr> <tr> <td>Total</td> <td>100</td> <td>55</td> </tr> <tr> <th colspan="3">Scores and grading</th> </tr> <tr> <th>Score</th> <th>Grade (B&H)</th> <th>Grade (ECTS)</th> </tr> <tr> <td>< 55</td> <td>5</td> <td>F, FX</td> </tr> <tr> <td>55-64</td> <td>6</td> <td>E</td> </tr> <tr> <td>65-74</td> <td>7</td> <td>D</td> </tr> <tr> <td>75-84</td> <td>8</td> <td>C</td> </tr> <tr> <td>85-94</td> <td>9</td> <td>B</td> </tr> <tr> <td>95-100</td> <td>10</td> <td>A</td> </tr> </tbody> </table>	Grading criteria			Criteria	Maximal score	Required score	1. Class attendance	5	3	2. Class activities	15	8	3. Midterm	40	22	4. Final exam	40	22	Total	100	55	Scores and grading			Score	Grade (B&H)	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
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Literature²:	<p>Mandatory literature</p> <ol style="list-style-type: none"> 1. Halaši, R., Kesler, M.(1976). <i>Metodika nastave hemije i demonstracioni ogledi</i>. Beograd: Naučna knjiga. 2. Zejnilagić-Hajrić, M., Zovko, E. (2009). <i>Demonstracioni praktikum iz hemije</i>. Sarajevo: Prirodno-matematički fakultet. 																																													

¹ 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

² 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

Supplementary literature:

1. Dragić, R., Zejnilagić, F. (1968). *Praktikum iz organske hemije*. Sarajevo: Zavod za izdavanje udžbenika.
2. Herak, J. (1980). *Građa prirode, Priručnik za nastavnike*. Zagreb: Školska knjiga.