



Course ID: HODAH12	Course name: ANALYSIS OF TRACE ELEMENTS IN WATER		
Cycle: THIRD	Year: FIRST	Semester: I	ECTS credits: 7
Course status: ELECTIVE		Total course hours: 45 Lectures: 30 Laboratory: 15	
Teaching participants:	Teachers and associates with expertise in the field to which the subject belongs [do not enter names in this section. Leave the wording as indicated in this section]		
Prerequisite for enrollment:	-		
Course aims:	The aim is to acquaint students with the measures that must be taken to prevent contamination of the water sample in which the analysis of trace elements is performed.		
Thematic course units:	<ol style="list-style-type: none">1. Definitions and functions of trace elements.2. Inorganic trace analysis: Traces and ultra traces, the need for determination of metal trace, influence of matrix and concentration, analysis planning.3. Working environment for analysis performing: Sources of contamination control of the atmosphere, laboratory and the human as a contamination source, approaches for cleaning the working environment.4. Laboratory materials: chemical and physical properties, types of materials used, selection of reagents.5. Sampling and storage of samples: specific factors in sample collection, factors influencing stability, vessels for storage and protection of samples during the storage.6. Reagents for the analysis: Grade of purity, selection and preservation of reagents.7. Water for analysis: Characteristics and control of water used in the trace analysis.8. Separation and concentration, calibration solutions and selection of the blank; Errors during work;9. Matrix and the influence of the matrix on the analyte;		
Learning outcomes:	Knowledge: After successfully completing the course, students will acquire knowledge of the measures that must be taken to prevent contamination of water samples. Skills: Enabling students for independent work and performing the procedure of analysis of elements in water by taking measures to prevent contamination of the sample		

	Competences: the student will be able to independently determine the impact of the matrix and perform an analysis of the elements in the water.																																										
Teaching methodology:	Oral presentation Practical work																																										
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. Seminar paper</td> <td>2x25</td> <td>28</td> </tr> <tr> <td>2. Midterms</td> <td>25</td> <td>13</td> </tr> <tr> <td>3. Final exam</td> <td>25</td> <td>14</td> </tr> <tr> <td>Total</td> <td>100</td> <td>55</td> </tr> </tbody> </table> <p>* Class activity is scored through the engagement of students in exercises.</p> <table border="1"> <thead> <tr> <th colspan="3">Scores and grading</th> </tr> <tr> <th>Score</th> <th>Grade (B&H)</th> <th>Grade (ECTS)</th> </tr> </thead> <tbody> <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. Seminar paper	2x25	28	2. Midterms	25	13	3. Final exam	25	14	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"> - <p>Supplementary literature:</p> <ol style="list-style-type: none"> Howard A.G. and Statham P.J. (1995), Inorganic trace analysis- philosophy and practice, JOHN WILEY & SONS Vandecasteele C. and Block C.B., (1995), Modern Methods for Trace Element Determination, JOHN WILEY & SONS Ebdon L., Pitts L., Cornelis R., Crews H., Donard O.F.X., Quevauviller P., (2001), Trace Element Speciation for Environment, Food and Health, The Royal Society of Chemistry, Cambridge CB4 0WF, UK Baranowska, I., 2016. Handbook of trace analysis. Handbook of Trace Analysis: Fundamentals and Applications, Springer 																																										

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

5. Desiderio V.J., Taylor C.E., Daéid N.N.(2020), Handbook of Trace Evidence Analysis, JOHN WILEY & SONS