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<tr><td>NAME OF THE COURSE</td><td colspan="5">Laboratory Course in Analytical Chemistry II</td></tr>
<tr><td>Code</td><td>PMC105</td><td>Year of study</td><td colspan="3">2.</td></tr>
<tr><td>Course teacher</td><td>Ivica Ljubenkov, associate professor</td><td>Credits (ECTS)</td><td colspan="3">3.0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2">Ivana Mitar, assistant professor</td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td></td><td></td><td>45</td><td></td></tr>
<tr><td>Status of the course</td><td>mandatory</td><td>Percentage of application of e-learning</td><td colspan="3">10 %</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Adopt and understand the basics principles and application of classical methods of qualitative and quantitative analysis of the matter.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Attending course Analytical Chemistry II.</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">Upon completion of the course, students will be able to:<br>1. explain the physic-chemical fundamentals of method of classical analysis,<br>2. distinguish methods by types of testing,<br>3. participate in selection of the appropriate test method according to the types of samples to be tested and<br>4. participate in calculation, explanation, and interpretation of the results of analyzes.</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">EXERCISES:<br><br>Qualitative analysis of cations and anions<br>1. Detection of cations of group I<br>2. Detection of cations of group II<br>3. Detection of cations of groups III and IV<br>4. Detection of cations of groups V and VI<br>5. Separation and detection of cations<br>6. Detection of anions of group I and II<br>7. Detection of anions of groups III and IV<br>8. Detection of anions of group IV<br>9. Separation and detection of anions<br>10. Quantitative analysis<br>11. Electrogravimetric separation of copper and nickel in the sample<br>12. Spectrophotometric determination of copper<br>13. Spectrophotometric determination of iron<br>14. Pigment analysis by IR spectrophotometry<br>15. Exercise review</td></tr>
<tr><td>Format of instruction</td><td colspan="2">☐ lectures<br>☐ seminars and workshops<br>x exercises<br>☐ on line in entirety<br>☐ partial e-learning<br>☐ field work</td><td colspan="3">☐ independent assignments<br>☐ multimedia<br>x laboratory<br>☐ work with mentor<br>☐ (other)</td></tr>
<tr><td>Student responsibilities</td><td colspan="5">Students are required to attend laboratory practice 100 % and actively participate in the teaching process. Before each exercise, students have written or oral exam. After each laboratory exercise students are obligatory to write a report. That will be recorded and evaluated in making a final assessment.</td></tr>
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<tr><td rowspan="6">Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>Class attendance</td><td></td><td>Research</td><td></td><td>Practical training</td><td>1.0</td></tr>
<tr><td>Experimental work</td><td></td><td>Report</td><td></td><td>practical</td><td></td></tr>
<tr><td>Essay</td><td></td><td>Seminar essay</td><td></td><td>Oral exam</td><td></td></tr>
<tr><td>Tests</td><td>0.5</td><td>Oral exam</td><td></td><td>Report</td><td>0.5</td></tr>
<tr><td>Written exam</td><td></td><td>Project</td><td></td><td>(Other)</td><td></td></tr>
<tr><td></td><td colspan="6"></td></tr>
<tr><td>Grading and evaluating student work in class and at the final exam</td><td colspan="6">All assignments for each exercise must be completed. The grade will be based on the oral or written colloquia that precede each exercise, the student's laboratory work, the exercise reports that the student writes at the end of each exercise, and possibly the final examination of the exercises. Practical work will be graded as each exercise is performed.</td></tr>
<tr><td rowspan="8">Required literature (available in the library and via other media)</td><td colspan="3">Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td colspan="3">1. D. A. Skoog, D. M. West, F. J. Holler and S. R. Crouch, Fundamentals of Analytical Chemistry, 9th Edition, Thompson Brooks/Cole, Belmont, USA, 2014.</td><td>10</td><td></td></tr>
<tr><td colspan="3">2. I. Mitar, Laboratory exercises for courses in analytical chemistry, internal, unlicensed script.</td><td></td><td></td></tr>
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<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="6">1. R. Kellner, J. M. Mermet, M. Otto, M. Valcarcel and H. M. Widmer, Analytical Chemistry (A Modern Approach to Analytical Science, Second Edition) Wiley-VCH, Verlag Gmbh & Co. KGaA, Weinheim, 2004.<br>2. D. C. Harris, Quantitative Chemical Analysis, W. H. Freeman and Company, 41 Madison Avenue New York, NY, 2016.<br>3. B. M. Tissue, Basic of Analytical Chemistry and Chemical Equilibria, John Wiley & Sons, Inc., Hoboken, New Jersey, NY, 2013.<br>4. G. D. Christian, P. K. Dasgupta, K. A. Schug, Analytical Chemistry, John Wiley & Sons, Inc., 111 River Street, Hoboken, New Jersey, NY, 2014.</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="6">Quality of the teaching and learning, monitored at the level of the (1) teachers, accepting suggestions of students and colleagues, and (2) faculty, conducting surveys of students on teaching quality.</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="6"></td></tr>
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