


**KAPITAŁ LUDZKI**  
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez  
 Unię Europejską w ramach  
 Europejskiego Funduszu  
 Społecznego

**UNIA EUROPEJSKA**  
 EUROPEJSKI  
 FUNDUSZ SPOŁECZNY


<b>Course title</b>		<b>ECTS code</b>															
Industrial analysis		13.3.0742															
<b>Name of unit administrating study</b>																	
Faculty of Chemistry																	
<b>Studies</b>																	
<table border="1"> <thead> <tr> <th>faculty</th> <th>field of study</th> <th>type</th> <th>all</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Faculty of Chemistry</td> <td rowspan="4">Chemical Business</td> <td>form</td> <td>all</td> </tr> <tr> <td>specjalty</td> <td>all</td> </tr> <tr> <td>specialization</td> <td>all</td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>		faculty	field of study	type	all	Faculty of Chemistry	Chemical Business	form	all	specjalty	all	specialization	all				
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		specialization	all														
<b>Teaching staff</b>																	
prof. dr hab. inż. Tadeusz Ossowski; dr Dorota Zarzeczkańska																	
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>															
<b>Forms of classes</b>		3 classes - 45 h tutorial classes – 5 h student's own work – 25 h  Total: 75 h - 3 ECTS															
Laboratory classes, Lecture																	
<b>The realization of activities</b>																	
classroom instruction																	
<b>Number of hours</b>																	
Laboratory classes: 30 hours, Lecture: 15 hours																	
<b>The academic cycle</b>																	
2025/2026 winter semester																	
<b>Type of course</b>		<b>Language of instruction</b>															
obligatory		polish															
<b>Teaching methods</b>		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>															
<ul style="list-style-type: none"> <li>- conducting experiments</li> <li>- lecture</li> </ul>		<b>Final evaluation</b>															
		Graded credit															
		<b>Assessment methods</b>															
		<ul style="list-style-type: none"> <li>- (mid-term / end-term) test</li> <li>- written exam (test)</li> </ul>															
		<b>The basic criteria for evaluation</b>															
		The basic criteria for evaluation or exam requirements positive evaluation of the written exam consisting of 5 open questions and 10 test questions covering the issues listed in the program content of the subject; answers to the questions will require solving tasks related to the learning outcomes; the grading scale will be adjusted to the rating range of the assessed written works Laboratory exercises: <ul style="list-style-type: none"> <li>• positive assessment of 5 tests covering the subject of performed experiments as part of laboratory exercises, performing all experiments provided for in the schedule (the quality of laboratory work, the way of conducting experiments as well as the ability to cooperate in a group will be evaluated) and analysis of the results obtained in the form of a written report</li> <li>• each negative assessment should be corrected. It is a prerequisite for passing the exercises</li> </ul>															
<b>Method of verifying required learning outcomes</b>																	
<b>Required courses and introductory requirements</b>																	
<b>A. Formal requirements</b>																	
analytical chemistry																	

<p><b>B. Prerequisites</b> basic knowledge of analytical chemistry, ability to work in a chemical laboratory, knowledge of basic laboratory glass, knowledge of working principles in the analytical laboratory</p>	
<p><b>Aims of education</b></p> <p>Aims of education</p> <ul style="list-style-type: none"> <li>• acquaint students with all the issues mentioned in the lectures program content,</li> <li>• acquainting students with basic groups of industrial analyzes</li> <li>• familiarizing students with the basic methods of sampling and preparation for analysis of samples in industrial plants</li> <li>• teaching students independent (using descriptions included in the instructions) conducting basic analyzes used in various branches of industry</li> <li>• developing the skills of critical evaluation and interpretation of the obtained experimental results and analysis of source texts</li> </ul>	
<p><b>Course contents</b></p> <p>Course contents</p> <p>A. Lecture topics: analytical sampling of water, sewage and waste; apparatus and equipment for sampling, principles of transport and storage of samples, preparation of samples for research, principles and selection of analytical method, selected measurement methods in industrial analysis, division, chemical and physical characteristics of materials fuel and lubricants and their analysis methods, division and classification of building materials, analytical methods used in construction, examples of analytical determinations in construction chemistry, analytical methods and procedures used in the food and pharmaceutical industry</p> <p>B. Subject of laboratory exercises: five exercises / experiments covering the following issues: determination of grain size composition of hard and brown coal by sieve analysis, ash determination, qualitative gasoline analysis, determination of sulfur content, determination of petroleum substances, determination of acid and alkaline value of lubricants, ignition temperature determination, determination of the total nitrogen content in nitrogen fertilizers</p>	
<p><b>Bibliography of literature</b></p> <p>Bibliography of literature</p> <p>Literature required to pass the course</p> <ol style="list-style-type: none"> <li>1. D. A. Skoog, D. M. West, F. J. Holler, S. R. Crouch, Podstawy chemii analitycznej, Tom 2, PWN, Warszawa 2007</li> <li>2. A. Cygański, Metody spektroskopowe w chemii analitycznej, WNT, Warszawa 2009</li> <li>3. W. Szczepaniak, Metody instrumentalne w analizie chemicznej, PWN, Warszawa 2008</li> <li>4. Z. Witkiewicz, "Podstawy chromatografii", WNT, Warszawa, 2005</li> </ol> <p>Extracurricular readings</p> <ol style="list-style-type: none"> <li>1. L. Czarnecki i inni Chemia w budownictwie Arkady Warszawa 1996</li> <li>2. E. Szczepaniec-Cięciak Chemia Środowiska, Kraków 1999</li> <li>3. S. Mercik Chemia rolna SGGW Warszawa 2002</li> </ol>	
<p><b>The learning outcomes (for the field of study and specialization)</b></p>	<p><b>Knowledge</b></p> <p>Knowledge</p> <p>describes and illustrates the basic apparatus used in industrial analysis</p> <p>describes industrial analytical processes using diagrams</p> <p>lists and characterizes sampling and analyzing techniques in industrial plants</p> <p>understands the necessity of applying the principles of safety and ergonomics in industrial analytical laboratories</p>
	<p><b>Skills</b></p> <p>Skills</p> <ol style="list-style-type: none"> <li>1. uses chemical terminology necessary to present (in written and oral form) the content of the subject</li> <li>2. anticipates the analytical course and calculates the results of analyzes</li> <li>3. uses the basic analytical techniques used in industrial plants</li> <li>4. designs and performs simple analytical experiments, selecting laboratory equipment in accordance with its intended use</li> <li>5. analyzes the results of conducted experiments, draws conclusions about the correctness of their course</li> </ol>
	<p><b>Social competence</b></p> <p>Social competence</p> <ol style="list-style-type: none"> <li>1. Understands the need for continuous education,</li> <li>2. takes care of the laboratory equipment entrusted</li> <li>3. is prudent in using laboratory equipment and working with chemical reagents</li> <li>4. appreciates the need to work in a team in accordance with its role (group manager / group member)</li> </ol>

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|  | <ul style="list-style-type: none"><li>5. is aware of the need for a critical analysis of his own work</li><li>6. shows cautious criticism in receiving information, particularly available in the mass media</li><li>7. is aware of the need for honest and reliable work</li></ul> |
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**Contact**

tadeusz.ossowski@ug.edu.pl