

Course title Analiza przemysłowa / Industrial analysis		ECTS code 13.3.0742	
Name of unit administrating study Faculty of Chemistry			
Studies			
Field of study	Type	Form	
Chemical Business	Bachelor / Engineer	Full-time studies	
Teaching staff Prof. dr hab.inż. Tadeusz Ossowski			
Forms of classes, the realization and number of hours		ECTS credits 3	
A. Forms of classes, in accordance with the UG Rector's regulations lecture, laboratory classes		classes - 45 h tutorial classes – 5 h student's own work – 25 h	
B. The realization of activities in-class learning		Total: 75 h - 3 ECTS	
C. Number of hours 45 h (30 h lecture, 15 h laboratory classes)			
The academic cycle Fourth year, winter semester			
Type of course obligatory		Language of instruction Polish	
Teaching methods Lecture Laboratory experiments		Form and method of assessment and basic criteria for evaluation or examination requirements	
		A. Final evaluation, in accordance with the UG study regulations course completion (with a grade)	
		B. Assessment methods Exam consisting of open questions and test questions	
		C. 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"> • 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 • each negative assessment should be corrected. It is a prerequisite for passing the exercises 	
Required courses and introductory requirements analytical chemistry 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			
Aims of education <ul style="list-style-type: none"> • acquaint students with all the issues mentioned in the lectures program content, • acquainting students with basic groups of industrial analyzes • familiarizing students with the basic methods of sampling and preparation for analysis of samples in industrial plants 			

- teaching students independent (using descriptions included in the instructions) conducting basic analyzes used in various branches of industry
- developing the skills of critical evaluation and interpretation of the obtained experimental results and analysis of source texts

Course contents

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

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

Bibliography of literature

A. Literature required to pass the course

1. I. D. A. Skoog, D. M. West, F. J. Holler, S. R. Crouch, Podstawy chemii analitycznej, Tom 2, PWN, Warszawa 2007
2. A. Cygański, Metody spektroskopowe w chemii analitycznej, WNT, Warszawa 2009
3. W. Szczepaniak, Metody instrumentalne w analizie chemicznej, PWN, Warszawa 2008
4. Z. Witkiewicz, "Podstawy chromatografii", WNT, Warszawa, 2005

B. Extracurricular readings

1. L. Czarnecki i inni Chemia w budownictwie Arkady Warszawa 1996
2. E. Szczepaniec-Cięciak Chemia Środowiska, Kraków 1999
3. S. Mercik Chemia rolna SGGW Warszawa 2002

Knowledge

describes and illustrates the basic apparatus used in industrial analysis
 describes industrial analytical processes using diagrams
 lists and characterizes sampling and analyzing techniques in industrial plants
 understands the necessity of applying the principles of safety and ergonomics in industrial analytical laboratories

Skills

1. uses chemical terminology necessary to present (in written and oral form) the content of the subject
2. anticipates the analytical course and calculates the results of analyzes
3. uses the basic analytical techniques used in industrial plants
4. designs and performs simple analytical experiments, selecting laboratory equipment in accordance with its intended use
5. analyzes the results of conducted experiments, draws conclusions about the correctness of their course

Social competence

1. Understands the need for continuous education,
2. takes care of the laboratory equipment entrusted
3. is prudent in using laboratory equipment and working with chemical reagents
4. appreciates the need to work in a team in accordance with its role (group manager / group member)
5. is aware of the need for a critical analysis of his own work
6. shows cautious criticism in receiving information, particularly available in the mass media
7. is aware of the need for honest and reliable work