

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Analytical Chemistry		Code 1010701231010713493
Field of study Chemical Technology	Profile of study (general academic, practical) (brak)	Year /Semester 2 / 3
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: - Classes: - Laboratory: 1 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art		ECTS distribution (number and %)
Responsible for subject / lecturer:		
dr inż. Mariusz Ślachciński email: Mariusz.Slachcinski@put.poznan.pl tel. 616652015 Wydział Technologii Chemicznej ul. Piotrowo 3 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of inorganic chemistry and analytical chemistry (acid-base reactions, oxidation-reduction reactions/titrations, complexes and complex formation titrations, precipitate-formation titrations), apparatus used in the chemical laboratory, mathematical tools used in the chemical calculations matematyczne wykorzystywane w obliczeniach chemicznych.
2	Skills	Usage a of basic chemical apparatus and volumetric glassware. Student can conduct basic determinations chemistry (acid-base reactions, oxidation-reduction reactions/titrations, complexes and complex formation titrations, precipitate-formation titrations). Student is able to perform basic chemical analysis, interprets the results of analyses and draw appropriate conclusions.
3	Social competencies	Understands the need to supplement her/his education and increasing personal and professional competences
Assumptions and objectives of the course:		
To familiarize students with the practical use of conventional techniques and methods used in analytical chemistry. Learning the proper way to conduct (methodology, preparation of standard solutions, titration, weighing,) the methods used in the laboratory		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. student has the necessary knowledge in the field of chemistry for the understanding of phenomena and processes occurring during the standard solution preparation and determination used in analytical chemistry - [[K_W03,K_W11] 2. student has a systematic, theoretically founded general knowledge in the field of standard solution preparation and determination of an analyte in the test sample - [K_W08]]		
Skills:		
1. Student can obtain the necessary information from the literature to conduct the preparation of standard solutions and determination of an analyte in the test sample. - [[K_U01]] 2. Student is able to perform basic chemical analysis, interprets the results of standard solution preparation step, analyte determination and draw appropriate conclusions. - [[K_U01, K_U18, K_U21]] 3. Student is able to work both individually and in team during the laboratory work. - [[K_U02]]		
Social competencies:		
1. The students understand the need for self-studying and improvement of their professional competences - [[K_K01]] 2. The student is aware of the principles of engineering ethics. - [[K_K02, K_K05]] 3. Students can cooperate and work in a group, taking different roles. - [[K_K03]]		

Assessment methods of study outcomes		
Written control work .Oral and written control of the student's knowledge before the laboratory classes. Written reports of the performed exercises.		
Course description		
1 The assessment of risks occurring during the laboratory work. 2 Preparation of the standard solution of 0.1 M hydrochloric acid solution. 3 Preparation of the standard solution of 0.1 M sodium hydroxide solution . 4 Determination of hydrochloric acid and phosphoric acid (V). 5 Calculating and interpreting the results.		
Basic bibliography:		
1. D.A.Skoog, D.M. West, F.J. Holler, S.R. Crouch, Podstawy chemii analitycznej, t.1 i 2, WNT Warszawa 2006/2007 2. J. Minczewski, Z. Marczenko, Chemia analityczna, t.1 i 2, WN PWN Warszawa 2007 3. . A. Cygański, Chemiczne metody analizy ilościowej, WNT Warszawa 2005 4. A. Cygański, B. Ptaszyński, J. Krystek, Obliczenia w chemii analitycznej, WNT Warszawa 2004 5. M. Wesołowski, K. Szefer, D. Zimna, Zbiór zadań z analizy chemicznej,WNT Warszawa 2002		
Additional bibliography:		
1. W. Ufnalski, Równowagi jonowe, WNT Warszawa 2004 2. A. Hulanicki, Reakcje kwasów i zasad w chemii analitycznej, WN PWN Warszawa 1992 3. Z. Galus, Ćwiczenia rachunkowe z chemii analitycznej, WN PWN Warszawa 1993		
Result of average student's workload		
Activity	Time (working hours)	
1. lab consultations	3	
2. lab preparations	5	
3. laboratory classes	15	
4. credit preparation	10	
5. credit	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	35	2
Contact hours	20	0
Practical activities	15	0