


**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>	
Monographic lecture - Chemistry of non-aqueous solutions		13.3.1112	
<b>Name of unit administrating study</b>			
Faculty of Chemistry			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	drugiego stopnia
Wydział Chemii	Biznes chemiczny	<b>form</b>	stacjonarne
		<b>specjalty</b>	wszystkie
		<b>specialization</b>	wszystkie
<b>Teaching staff</b>			
prof. dr hab. inż. Lech Chmurzyński			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		3	
Lecture		Lecture: 30 hours	
<b>The realization of activities</b>		consultations: 10 hours	
classroom instruction		student's own work : 35 hours	
<b>Number of hours</b>		Total: 75 hours - 3 ECTS	
Lecture: 30 hours			
<b>The academic cycle</b>			
2023/2024 summer 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>	
multimedia-based lecture		<b>Final evaluation</b>	
		Graded credit	
		<b>Assessment methods</b>	
		Written test with closed questions	
		<b>The basic criteria for evaluation</b>	
		positive assessment of a written test according to criteria consistent with the Study Regulations UG	
<b>Method of verifying required learning outcomes</b>			
<b>Required courses and introductory requirements</b>			
<b>A. Formal requirements</b>			
none			
<b>B. Prerequisites</b>			
none			
<b>Aims of education</b>			
Aims of education			
<ul style="list-style-type: none"> <li>making students familiar with the topics of the programme,</li> <li>introduction to the basics of experimental methods for determining the equilibrium constants in solutions</li> <li>skills to choose the appropriate experimental method to determine the thermodynamic description of the solution</li> </ul>			
<b>Course contents</b>			
Course contents			
non-aqueous solvents; acid-base equilibria in non-aqueous solvents; acid-base theories; the role of solvent; non-aqueous solvents classification systems, binary mixed solvents; synthesis reactions and electrode processes in non-aqueous solvents, review of non-aqueous solvents; acid-base			

titrations in non-aqueous solvents; hydrogen bond; proton-transfer equilibria; potentiometry in non-aqueous solvents; determination of acid-base equilibria in solvents by means of potentiometric methods; conductance equations, determination methods of association constants and boundary conductivities on the basis of conductivity equation	
<b>Bibliography of literature</b> Bibliography of literature Literature required to pass the course  D. A. Skoog, D.M. West, F.J. Holler – Fundamentals of Analytical Chemistry J. Kenkel – Analytical Chemistry for Technicians T. Jasiński – Analiza miareczkowa w środowiskach niewodnych J. Minczewski, Z. Łada – Miareczkowanie potencjometryczne J. Minczewski, Z. Marczenko – Chemia analityczna S.F.A. Kettle – Fizyczna chemia nieorganiczna S.J. Lippard, J.M. Berg – Podstawy chemii bioinorganicznej	
<b>The learning outcomes (for the field of study and specialization)</b>	<b>Knowledge</b>  Knowledge  The student - knows the basic classification systems for liquid chemical reaction solutions; - knows and understands the processes of acid-base interactions occurring in non-aqueous solutions; - understands the theory of hydrogen bonding and proton transfer equilibria in non-aqueous solutions; - understands the analytical aspects of acid-base interactions in non-aqueous environments and their consequences in analytical techniques; - knows the methods of determining constant equilibrium values in non-aqueous environments based on the potentiometric, conductometric and spectrophotometric methods.
	<b>Skills</b>
	<b>Social competence</b>  Social competence  The student understands the need for learning, inspires and organizes the learning process of others; interacts and works in a group, assuming various roles (in particular the role of group leader); demonstrates creativity in setting priorities for the implementation of the task specified by himself or others; demonstrates creativity in independent and team work; understands the social aspects of the practical application of acquired knowledge and skills and the associated responsibilities; understands the need for creative discussion, including scientific discussion; can initiate this type of discussion.
	<b>Contact</b>  lech.chmurzynski@ug.edu.pl