


**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>	
Diploma lecture - Solution chemistry		13.3.0439	
<b>Name of unit administrating study</b>			
Faculty of Chemistry			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	pierwszego stopnia
Wydział Chemii	Chemia	<b>form</b>	stacjonarne
		<b>specjalty</b>	chemia biomedyczna, chemia kosmetyków, analityka i diagnostyka chemiczna, chemia żywności
		<b>specialization</b>	wszystkie
<b>Teaching staff</b>			
prof. dr hab. inż. Tadeusz Ossowski; 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>		2	
Lecture		Lecture: 30 hours	
<b>The realization of activities</b>		consultations: 5 hours	
classroom instruction		student's own work : 15 hours	
<b>Number of hours</b>		Total: 50 hours - 2 ECTS	
Lecture: 30 hours			
<b>The academic cycle</b>			
2024/2025 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>			
<ul style="list-style-type: none"> <li>•To acquaint students with all the issues listed in the course contents</li> <li>• To acquaint students with the basic groups of biomolecules; learning their structure and function</li> <li>•To acquaint students with the basic methods of bioanalytical chemistry used to identify and quantify and qualitatively analyze organic compounds found in living organisms</li> </ul>			
<b>Course contents</b>			
Course contents			
Water as a specific solvent. Classification and characterization of liquid environments for chemical reactions. Principles of non-aqueous environment			

chemistry. Interactions acid – base and equilibria of thereof. Hydrogen bond. Principles of supramolecular chemistry. Equilibria in solutions of complex compounds. Conductometric, spectroscopic and potentiometric methods for assessing chemical equilibria. Interphase phenomena. Kinetic and thermodynamic aspects of chemical equilibria.

### Bibliography of literature

Literature required to pass the course

A.2. Literature for individual studies

L. Sobczyk, A. Kiszka – Chemia fizyczna dla przyrodników

L. Sobczyk – Wiązania wodorowe

W. Szczepaniak – Metody instrumentalne w analizie chemicznej

A. Kiszka – Elektrochemia

M. R. Wright – An Introduction to Aqueous Electrolyte

W. Ufnalski – Równowagi jonowe

J. Minczewski, Z. Łada – Miareczkowanie potencjometryczne

Extracurricular readings

• Selected scientific publications in the field of discussed issues.

### The learning outcomes (for the field of study and specialization)

#### Knowledge

1. Knows the basic systems of classification of liquid chemical reaction environments.
2. Knows processes and understands acid-base interactions occurring in liquid environments, in particular in aqueous solutions.
3. Knows chemical terminology and nomenclature regarding processes in solutions and coordination compounds.
4. Understands hydrogen bonding and proton transfer equilibria in non-aqueous environments.
5. Knows the basic methods of testing equilibrium in liquid environments, in particular in aqueous solutions.
6. Knows methods of solution description.

#### Skills

1. Describes liquid reaction systems.
2. Can predict the scheme of basic equilibria settling in solutions.
3. Has the ability to describe aqueous solutions, taking into account the specific properties of water.
4. Has the ability to independently solve problems in solution chemistry.
5. Is able to use basic analytical techniques (potentiometry, conductometry and spectrophotometry) to study equilibrium in solutions.
6. Can analyze the kinetic and thermodynamic aspects of acid-base equilibria and coordination equilibria in solution.

#### Social competence

1. Understands the need for continuous education.
2. Organizes the learning process of others.
3. Interacts and works in a group, taking on various roles in it.
4. Demonstrates creativity in setting priorities for the implementation of the task specified by himself or others.
5. Demonstrates creativity in independent and team work.
6. Understands the social aspects of the practical application of acquired knowledge and skills and the associated responsibility.

### Contact

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