

<b>Course title</b> Wykład monograficzny – Chemia środowisk niewodnych / Monographic lecture - Chemistry of non-aqueous solutions		<b>ECTS code</b> 13.3.1112	
<b>Name of unit administrating study</b> Faculty of Chemistry			
<b>Studies</b>			
<b>Field of study</b>	<b>Type</b>	<b>Form</b>	
Chemical business	Master	Full-time studies	
<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>A. Forms of classes, in accordance with the UG Rector's regulations</b> Lecture		Lecture: 30 hours consultations: 10 hours student's own work : 35 hours Total: 75 hours - 3 ECTS	
<b>B. The realization of activities</b> classes in classrooms			
<b>Number of hours</b> 30			
<b>The academic cycle</b> Second year, summer semester			
<b>Type of course</b> obligatory		<b>Language of instruction</b> Polish	
<b>Teaching methods</b> Lecture with multimedia presentation		<b>Form and method of assessment and basic criteria for evaluation or examination requirements</b>	
		<b>A. Final evaluation, in accordance with the UG study regulations</b> Graded assignment	
		<b>B. Assessment methods</b> Written test with closed questions	
		<b>C. The basic criteria for evaluation or exam requirements</b> • positive assessment of a written test according to criteria consistent with the Study Regulations UG	
<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>• 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> 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			

## **Bibliography of literature**

### **A. 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 bionieorganicznej

## **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.

## **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.