


**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 - Quantum chemistry of molecular anions		13.3.0432	
<b>Name of unit administrating study</b>			
null			
<b>Studies</b>			
<b>faculty</b>	<b>field of study</b>	<b>type</b>	drugiego stopnia
Wydział Chemii	Chemia	<b>form</b>	stacjonarne
		<b>specjalty</b>	chemia biomedyczna, chemia i technologia środowiska, analityka i diagnostyka chemiczna, chemia obliczeniowa
		<b>specialization</b>	wszystkie
<b>Teaching staff</b>			
prof. dr hab. Piotr Skurski			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b>	
<b>Forms of classes</b>		3	
Lecture		classes 30 h	
<b>The realization of activities</b>		tutorial classes 10 h.	
classroom instruction		student's own work 35 h	
<b>Number of hours</b>		TOTAL: 75 h - 3 ECTS	
Lecture: 30 hours			
<b>The academic cycle</b>			
2023/2024 winter 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>	
		oral course credit	
		<b>The basic criteria for evaluation</b>	
		Passing the final oral exam covering the issues presented during the lectures	
<b>Method of verifying required learning outcomes</b>			
<b>Required courses and introductory requirements</b>			
<b>A. Formal requirements</b>			
quantum chemistry			
<b>B. Prerequisites</b>			
basic knowledge concerning chemical structure of molecules and chemical bonds			
<b>Aims of education</b>			
acquainting students with the basic knowledge concerning molecular anions – their classification, properties, and applications			
<b>Course contents</b>			
Electronic structure of molecular anions, most fundamental properties of molecular anions, classification of anions based on the potential responsible for an excess electron binding, various types of molecular anions: valence-bound anions, multipole-bound anions, metastable anions, multiply charged anions, cluster anions, double-Rydberg anions, solvated electrons. Modern theoretical methods used for studying molecular anions, the most recent discoveries concerning the subject.			
The course will provide the knowledge about molecular anions in general and various types of negatively charged systems in particular. In addition,			

the proper selection of theoretical methods appropriate for studying certain types of anions will be explained. The course will also cover the problem of electronic, kinetic and thermodynamic stability of anions	
<b>Bibliography of literature</b>	
Literature required to pass the course	
A.1. Literature used during classes:	
Theoretical Prospects of Negative Ions, ed. J. Kalcher, Research Signpost, Trivandrum, 2002, An Introduction to Theoretical Chemistry, Jack Simons, Cambridge University Press, 2003.	
A.2. Literature for individual studies :	
Theoretical Prospects of Negative Ions, ed. J. Kalcher, Research Signpost, Trivandrum, 2002, An Introduction to Theoretical Chemistry, Jack Simons, Cambridge University Press, 2003.	
<b>The learning outcomes (for the field of study and specialization)</b>	<b>Knowledge</b>
	the student defines the basic types of anions and explains their stability by characterizing the most important interactions responsible for an excess electron binding; the student is capable of describing the most important theoretical methods utilized for studying negatively charged systems.
	<b>Skills</b>
	<b>Social competence</b>
	After the course, the students are expected to understand the necessity of further learning, they are also taught to approach the problems and formulate their opinions with caution and criticism. In addition, the students are expected to remain open-minded for new ideas.
<b>Contact</b>	
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