

<b>Course title</b> Matematyka II / Mathematics II		<b>ECTS code</b> 13.3.0843	
<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	Bachelor / Engineer	Full-time studies	
<b>Teaching staff</b> Dr Aleksandra Nowel			
<b>Forms of classes, the realization and number of hours</b>		<b>ECTS credits</b> 6	
<b>A. Forms of classes, in accordance with the UG Rector's regulations</b> lecture, auditorium classes		classes - 60 h tutorial classes – 20 h student's own work – 70 h	
<b>B. The realization of activities</b> in-class learning			
<b>C. Number of hours</b> 60 h (30 h lecture, 30 h auditorium classes)		Total: 150 h - 6 ECTS	
<b>The academic cycle</b> First year, summer semester			
<b>Type of course</b> obligatory		<b>Language of instruction</b> Polish	
<b>Teaching methods</b>  Lecture Problems solving		<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> lecture - exam, auditorium classes – course credit with a grade	
		<b>B. Assessment methods</b> Lecture <ul style="list-style-type: none"> <li>• exam with open/closed questions</li> </ul> Auditorium classes: <ul style="list-style-type: none"> <li>• attendance, active participation, tests and quizzes</li> </ul>	
		<b>C. The basic criteria for evaluation or exam requirements</b>  Lecture: <ul style="list-style-type: none"> <li>• pass the exam with open questions</li> </ul> 91-100%: 5.0 81-90%: 4.5 71-80%: 4.0 61-70%: 3.5 51-60%: 3.0 Less than 51% 2.0  Auditorium classes: <ul style="list-style-type: none"> <li>• completed all tests</li> </ul> 91-100%: 5.0 81-90%: 4.5 71-80%: 4.0 61-70%: 3.5 51-60%: 3.0 Less than 51% 2.0	
<b>Required courses and introductory requirements</b> Mathematics I			

### Aims of education

Introduction to the notion of series, to linear algebra and statistics, in particular the mathematical tools that can be applied in describing physical and chemical processes and business problems

Teaching the ability of understanding abstract problems

### Course contents

1. Complex numbers
2. Matrices
3. Systems of linear equations
4. Linear spaces
5. Sequences and series
6. Elements of statistics

### Bibliography of literature

#### A. Literature required to pass the course

M. Gewert, Z. Skoczylas, Analiza matematyczna 1. Przykłady i zadania

G. Kwiecińska: Matematyka : kurs akademicki dla studentów nauk stosowanych. Cz. 2, Analiza funkcji jednej zmiennej

G. Kwiecińska: Matematyka : kurs akademicki dla studentów nauk stosowanych. Cz. , Analiza funkcji wielu zmiennych

W. Krysicki, L. Włodarski: Analiza matematyczna w zadaniach. 1 i 2

#### B. Extracurricular readings

Erich Steiner : „Matematyka dla chemików”, Warszawa, Wydaw. Naukowe PWN, 2001.

Halina Pidek--Łopuszańska: „Matematyka dla chemików”, Wiedza Powszechna, Warszawa 1974.

### Knowledge

methods of verifying the solvability of linear systems and how to find the solution set

basic operations on matrices

operating on complex numbers

properties of linear spaces over  $\mathbb{R}$  and  $\mathbb{C}$

kriterions of series convergence, methods of finding limits of sequences

rules and formulas of statistics and how to apply them to solve problems

### Skills

ability of solving problems from linear algebra, statistics, series theory and applications,

connecting these problems with suitable theory,

using main tools of calculus, linear algebra and statistics to describe associations between different variables

### Social competence

presentation of a solution of a problem, explaining the details to the other students

working alone and together with other students to understand the theory presented during the lecture and to solve problems during the classes

responsibility for oneself's work as well as for the work of the group, keeping the rules of working together in a team