

## DESCRIPTION OF THE COURSE OF STUDY

<b>Course code</b>	<b>0531.6.CHEM1.D.PAC</b>	
<b>Name of the course in</b>	Polish	Podstawy analizy chromatograficznej
	English	Fundamentals of chromatographic analysis

### 1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

<b>1.1. Field of study</b>	<b>Chemistry</b>
<b>1.2. Mode of study</b>	<b>Full-time studies</b>
<b>1.3. Level of study</b>	<b>First-cycle studies</b>
<b>1.4. Profile of study*</b>	<b>General academic</b>
<b>1.5. Person/s preparing the course description</b>	<b>Dr Dariusz Widel Dr hab. Paweł Mochalski, prof. UJK</b>
<b>1.6. Contact</b>	<b>dariusz.widel@ujk.edu.pl</b>

### 2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

<b>2.1. Language of instruction</b>	<b>English</b>
<b>2.2. Prerequisites*</b>	<b>General and analytical chemistry, basis of physical chemistry</b>

### 3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

<b>3.1. Form of classes</b>	Lectures – 30h, laboratory exercises – 30h	
<b>3.2. Place of classes</b>	Classes in the teaching room of the UJK	
<b>3.3. Form of assessment</b>	Lecture - credit with grade, laboratory exercises - credit with grade	
<b>3.4. Teaching methods</b>	Lecture, discussion, demonstration, independent experiments	
<b>3.5. Bibliography</b>	<b>Required reading</b>	“Chromatography: Basic Principles, Sample Preparations and Related Methods Elsa Lundanes et. al; John Wiley and Sons, 2013
	<b>Further reading</b>	“Handbook of Chromatography” Carol Evans, Willford Press, 2019

### 4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

<p><b>4.1. Course objectives (including form of classes)</b>  <b>LECTURE</b></p> <ul style="list-style-type: none"> <li>- <i>Introduction to modern of chromatography and electromigration methods needed to correct understanding of chemistry,</i></li> <li>- <i>Basic definitions, theory of selected chromatographic methods</i></li> </ul> <p><b>EXERCISES</b></p> <ul style="list-style-type: none"> <li>- Introduction to practical aspects of gas and liquid chromatography, performance of chromatographic analyses,</li> <li>- Preparing laboratory reports, elaborating the results of chromatographic analyses</li> </ul>	
<p><b>4.2. Detailed syllabus (including form of classes)</b></p> <p>Lecture:            Separation techniques, the theory of separation phenomena. Theory of chromatography separation. The division of chromatographic techniques. Basic retention parameters. Chromatographic resolution. The Van Deemter’s equation. Gas chromatography, liquid chromatography, thin-layer chromatography and supercritical chromatography. Detectors used in chromatography techniques. Electromigration. The division of electromigration techniques. Qualitative and quantitative analysis. Conjugated techniques with chromatography.</p> <p>Laboratory exercises:            Detailed description of gas and liquid chromatography systems. Determination of chromatographic column efficiency. Performance of qualitative and quantitative chromatographic analysis of selected chemical compounds. Elaboration of the results and preparing laboratory reports.</p>	
<p><b>4.3 Intended learning outcomes</b></p>	

Code	A student, who passed the course	Relation to learning outcomes
within the scope of <b>KNOWLEDGE:</b>		
W03	Student knows at advanced level basic software for experimental data analysis	CHEM1A_W03

W06	Student has knowledge from analytical chemistry needed for the theoretical justification of the analytical method choice, knows and understands at advanced level the classic analytical methods and capabilities of selected instrumental methods.	CHEM1A_W06
within the scope of <b>ABILITIES:</b>		
U01	Student can use modern chemical nomenclature and specialized chemical definitions, is able to link the chemical properties of substances with their use, is able to define, describe and calculate various physicochemical quantities	CHEM1A_U01
U02	is able to select and use classical methods and selected instrumental methods in qualitative and quantitative analysis	CHEM1A_U02
U03	Student can select and use mathematical methods and basic software packages utility for solving chemistry problems	CHEM1A_U03
U14	is able to plan and organize own work and work in a team	CHEM1A_U14
within the scope of <b>SOCIAL COMPETENCE:</b>		
K01	is ready to critically evaluate their knowledge	CHEM1A_K01
K02	is ready to initiate actions for the environment, including the natural environment	CHEM1A_K02

4.4. Methods of assessment of the intended learning outcomes																					
Teaching outcomes (code)	Method of assessment (+/-)																				
	Written colloquium			Test*			Project*			Effort in class*			Self-study*			Group work*			Lab. report		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes					
	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...
W03																					
W06	+				+						+						+				
U01	+				+						+						+				
U02														+			+				
U03					+						+			+			+				+
U14																	+				
K01	+				+						+			+			+				+
K02	+				+									+			+				

\*delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes		
Form of classes	Grade	Criterion of assessment
lecture (L) (including e-learning)	3	Written colloquium - test, 51-60% correct answers
	3,5	Written colloquium - test, 61-70% correct answers
	4	Written colloquium - test, 71-80% correct answers
	4,5	Written colloquium - test, 81-90% correct answers
	5	Written colloquium - test, 91-100% correct answers
classes (C)* (laboratory)	3	Credit with grade - test, 51-60% correct answers
	3,5	Credit with grade - test, 61-70% correct answers
	4	Credit with grade - test, 71-80% correct answers
	4,5	Credit with grade - test, 81-90% correct answers
	5	Credit with grade - test, 91-100% correct answers

## 5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
<i>NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/</i>	<b>60</b>	
<i>Participation in lectures*</i>	30	
<i>Participation in classes, seminars, laboratories*</i>	30	
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>	<b>40</b>	
<i>Preparation for the lecture*</i>	10	

<i>Preparation for the classes, seminars, laboratories*</i>	10	
<i>Preparation for the exam/test*</i>	20	
<b>TOTAL NUMBER OF HOURS</b>	<b>100</b>	
ECTS credits for the course of study	<b>4</b>	

*\*delete as appropriate*

**Accepted for execution** (date and legible signatures of the teachers running the course in the given academic year)

.....