

## Master seminar - didactic laboratory of general and analytical chemistry

### Educational subject description sheet

#### Basic information

<b>Study programme</b> Chemistry <b>Speciality</b> - <b>Organizational unit</b> Faculty of Chemistry <b>Study level</b> Second-cycle programme <b>Study form</b> Full-time <b>Education profile</b> General academic		<b>Didactic cycle</b> 2023/24 <b>Subject code</b> 02CHSS.2EP.05190.23 <b>Lecture languages</b> English <b>Course type</b> Elective <b>Block</b> Basic subjects
<b>Subject coordinator</b>	Renata Jastrzb, Rafa Wawrzyniak	
<b>Lecturer</b>	Renata Jastrzb, Rafa Wawrzyniak	
<b>Period</b> Semester 2	<b>Activities and hours</b> • Seminar: 30, Graded credit	<b>Number of ECTS points</b> 5
<b>Period</b> Semester 3	<b>Activities and hours</b> • Seminar: 30, Graded credit	<b>Number of ECTS points</b> 5
<b>Period</b> Semester 4	<b>Activities and hours</b> • Seminar: 30, Graded credit	<b>Number of ECTS points</b> 5

## Goals

Code	Goal
C1	Develop the ability to apply the acquired theoretical knowledge to experimental work in general and analytical chemistry.
C2	Develop the ability to use chemical literature and databases, also in English, in the field of general and analytical chemistry.
C3	Develop the ability to work independently on a given subject in the field of general and analytical chemistry, including making calculations and selecting laboratory methods.
C4	Develop the ability to write scientific papers, present information and data, use literature sources, databases and patents.
C5	Learning methods of data analysis appropriate to the issue to be solved, interpreting the results obtained, drawing conclusions.
C6	Acquaintance with the methodology of writing a master's thesis and the forms of disseminating its results (master's thesis, conference presentation, scientific publication).
C7	Acquiring the ability to present experimental results (oral presentation, poster) and to discuss a given topic.
C8	Ability to write a longer study describing the results of the experimental work, taking into account literature data.

## Entry requirements

No prerequisites required.

## Subject learning outcomes

Code	Outcomes in terms of	Learning outcomes	Examination methods
<b>Knowledge - Student:</b>			
W1	knows and understands the research methods and apparatus used in the experiments for the master's thesis carried out in the general and analytical chemistry laboratory.	CHS_K2_W01, CHS_K2_W04, CHS_K2_W09	Project
W2	knows and understands the latest scientific developments relating to the research topic within his/her Master's thesis in general and analytical chemistry.	CHS_K2_W01, CHS_K2_W02, CHS_K2_W03, CHS_K2_W04	Project
W3	knows and understands methods of data analysis appropriate to the problem being solved in general and analytical chemistry.	CHS_K2_W01, CHS_K2_W02, CHS_K2_W08	Project
<b>Skills - Student:</b>			
U1	is able to read with comprehension a scientific text, also in English, related to the subject of the master's thesis in general and analytical chemistry.	CHS_K2_U01, CHS_K2_U02, CHS_K2_U12, CHS_K2_U13, CHS_K2_U14	Project

Code	Outcomes in terms of	Learning outcomes	Examination methods
U2	is able to use literature sources, databases and patents and read with comprehension a scientific text related to the topic of the master's thesis on general and analytical chemistry.	CHS_K2_U01, CHS_K2_U02, CHS_K2_U12, CHS_K2_U13, CHS_K2_U14	Project
U3	is able to prepare and deliver a paper directly related to his/her studies and to speak in a scientific discussion.	CHS_K2_U01, CHS_K2_U02, CHS_K2_U13	Project
U4	is able to prepare a scientific presentation on the theory and design of the research, the current state of knowledge, the research thesis, the apparatus used and the interpretation and discussion of the results obtained.	CHS_K2_U01, CHS_K2_U12, CHS_K2_U13	Project
<b>Social competences - Student:</b>			
K1	is willing/ready to discuss the professional ethics of a chemist and to lead a discussion on ongoing research.	CHS_K2_K01, CHS_K2_K03, CHS_K2_K04	Project

### Study content

No.	Course content	Subject learning outcomes	Activities
1.	Familiarisation with working on specialised databases.	W1, W2, W3, U1, U2	Seminar
2.	Finding solutions to scientific problems using specialised databases and an Internet search engine.	W1, W2, U2	Seminar
3.	Issues of ethics and plagiarism in research and academic studies, e.g. in master's theses, scientific articles.	U3, U4, K1	Seminar
4.	Methodology for planning scientific experiments and critically interpreting their results.	W2, W3, U2, U3, U4	Seminar
5.	Methodology for the preparation of scientific studies, including the master's thesis.	U3, U4, K1	Seminar
6.	Ways of presenting direct results (preparing and delivering presentations) and leading scientific discussions.	U3, U4, K1	Seminar

### Additional information

#### Semester 2

Activities	Teaching and learning methods and activities
Seminar	Discussion, Work with text, Solving tasks (e.g. computational, artistic, practical), Research method (scientific inquiry), Project method, Demonstration and observation, Activating method - "brainstorming"

Activities	Credit conditions
Seminar	<p>A prerequisite for passing is the preparation and presentation of issues related to the subject of the study in progress.</p> <p>Grading scale with applied percentage distribution:</p> <ul style="list-style-type: none"> <li>• excellent (5.0): achievement of the student's expected learning outcomes at a minimum of 90.0%.</li> <li>• very good (4.5): achievement by the student of the desired learning outcomes ranging from 80.0% - 89.9%.</li> <li>• good (4.0): achievement of student learning outcomes 70.0% - 79.9%.</li> <li>• average (3.5): achievement of student learning outcomes 60.0% - 69.9%.</li> <li>• satisfactory (3.0): attainment of the student learning outcomes within 50.0% - 59.9%.</li> <li>• unsatisfactory (2.0): failure of the student to achieve the expected learning outcomes below 50.0%.</li> </ul>

### Semester 3

Activities	Teaching and learning methods and activities
Seminar	Discussion, Work with text, Solving tasks (e.g. computational, artistic, practical), Research method (scientific inquiry), Project method, Demonstration and observation, Activating method - "brainstorming"

Activities	Credit conditions
Seminar	<p>A prerequisite for passing is the preparation and presentation of issues related to the subject of the study in progress.</p> <p>Grading scale with applied percentage distribution:</p> <ul style="list-style-type: none"> <li>• excellent (5.0): achievement of the student's expected learning outcomes at a minimum of 90.0%.</li> <li>• very good (4.5): achievement by the student of the desired learning outcomes ranging from 80.0% - 89.9%.</li> <li>• good (4.0): achievement of student learning outcomes 70.0% - 79.9%.</li> <li>• average (3.5): achievement of student learning outcomes 60.0% - 69.9%.</li> <li>• satisfactory (3.0): attainment of the student learning outcomes within 50.0% - 59.9%.</li> <li>• unsatisfactory (2.0): failure of the student to achieve the expected learning outcomes below 50.0%.</li> </ul>

### Semester 4

Activities	Teaching and learning methods and activities
Seminar	Discussion, Work with text, Solving tasks (e.g. computational, artistic, practical), Research method (scientific inquiry), Project method, Demonstration and observation, Activating method - "brainstorming"

Activities	Credit conditions
Seminar	<p>A prerequisite for passing is the preparation and presentation of issues related to the subject of the study in progress.</p> <p>Grading scale with applied percentage distribution:</p> <ul style="list-style-type: none"> <li>• excellent (5.0): achievement of the student's expected learning outcomes at a minimum of 90.0%.</li> <li>• very good (4.5): achievement by the student of the desired learning outcomes ranging from 80.0% - 89.9%.</li> <li>• good (4.0): achievement of student learning outcomes 70.0% - 79.9%.</li> <li>• average (3.5): achievement of student learning outcomes 60.0% - 69.9%.</li> <li>• satisfactory (3.0): attainment of the student learning outcomes within 50.0% - 59.9%.</li> <li>• unsatisfactory (2.0): failure of the student to achieve the expected learning outcomes below 50.0%.</li> </ul>

## Literature

### Obligatory

1. Literature indicated by the MSc general and analytical chemistry supervisor

## Calculation of ECTS points

### Semester 2

Activities	Activity hours*
Seminar	30
Reading the indicated literature	30
Preparation of a diploma thesis	30
Preparation of a project	40
Report preparation	15
<b>Student workload</b>	<b>Hours</b> 145
<b>Number of ECTS points</b>	<b>ECTS</b> 5

\* academic hour = 45 minutes

### Semester 3

Activities	Activity hours*
Seminar	30
Reading the indicated literature	30
Preparation of a diploma thesis	30

Preparation of a project	45
Report preparation	15
<b>Student workload</b>	<b>Hours</b> 150
<b>Number of ECTS points</b>	<b>ECTS</b> 5

\* academic hour = 45 minutes

## Semester 4

Activities	Activity hours*
Seminar	30
Reading the indicated literature	30
Preparation of a diploma thesis	30
Preparation of a project	45
Preparation of a multimedia presentation	15
<b>Student workload</b>	<b>Hours</b> 150
<b>Number of ECTS points</b>	<b>ECTS</b> 5

\* academic hour = 45 minutes

## Efekty uczenia się dla kierunku

Kod	Treść
CHS_K2_K01	The graduate is ready to identify and evaluate cognitive and practical problems in the field of chemical research
CHS_K2_K03	The graduate is ready to propose alternative solutions aimed at responsible decision-making, taking into account economic and social factors
CHS_K2_K04	The graduate is ready to appreciating, promoting and adhering to professional ethics in their own and others' activities
CHS_K2_U01	The graduate can use chemical terminology consistent with IUPAC recommendations
CHS_K2_U02	The graduate can analyze the physicochemical properties of substances based on the selection of appropriate methods and tools
CHS_K2_U12	The graduate can draw conclusion properly and evaluate critically on the basis of data from self-conducted chemical or physicochemical experiments and literature resources
CHS_K2_U13	The graduate can deepens his specialistic knowledge to the extent necessary to solve and interpret the undertaken problem correctly
CHS_K2_U14	The graduate can express in an accessible way the acquired knowledge, conduct a debate and present the results of scientific projects in chemistry
CHS_K2_W01	The graduate knows and understands selected advanced issues in the field of chemistry
CHS_K2_W02	The graduate knows and understands concepts and relationships allowing for a quantitative description of complex physico-chemical phenomena
CHS_K2_W03	The graduate knows and understands mechanisms of advanced chemical reactions and indicates their interrelationship and importance in science
CHS_K2_W04	The graduate knows and understands physico-chemical properties of chemical compounds and materials depending on their structure / composition
CHS_K2_W08	The graduate knows and understands advanced chemical technology processes
CHS_K2_W09	The graduate knows and understands the ethical, legal and economic conditions applicable in the field of chemical sciences