



UNIVERSITATEA BABES-BOLYAI  
BABES-BOLYAI TUDOMÁNYEGYETEM  
BABES-BOLYAI UNIVERSITÄT  
BABES-BOLYAI UNIVERSITY  
TRADITIO ET EXCELLENTIA

Tradiție și Excelență prin  
Cultură - Știință - Inovație din 1581



Facultatea de Chimie și Inginerie Chimică

Str. Arany János nr. 11  
Cluj-Napoca, cod poștal 400028  
Tel.: 0264-59.38.33  
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secretariat.chem@ubbcluj.ro  
www.chem.ubbcluj.ro

## SYLLABUS

### Research Methodology and Ethics

University year 2025/2026

#### 1. Information regarding the programme

1.1. Higher education institution	Babes-Bolyai University, Cluj-Napoca
1.2. Faculty	Chemistry and Chemical Engineering
1.3. Department	Chemistry
1.4. Field of study	Chemistry
1.5. Study cycle	Master
1.6. Study programme/Qualification	Advanced chemical process engineering
1.7. Form of education	Full-time education

#### 2. Information regarding the discipline

2.1. Name of the discipline		Research Methodology and Ethics					Discipline code		CME6132		
2.2. Course coordinator					Acad. Prof. Dr. Cristian Silvestru					4	
2.3. Seminar coordinator					Lect. Dr. Alexandra Pop						
2.4. Year of study		I	2.5. Semester		2	2.6. Type of evaluation		C	2.7. Discipline regime		FD

#### 3. Total estimated time (hours/semester of didactic activities)

3.1. Hours per week	3	of which: 3.2 course	1	3.3 seminar/laboratory	2
3.4. Total hours in the curriculum	42	of which: 3.5 course	14	3.6 seminar/laboratory	28
<b>Time allotment for individual study (ID) and self-study activities (SA)</b>					<b>hours</b>
Learning using manual, course support, bibliography, course notes (SA)					20
Additional documentation (in libraries, on electronic platforms, field documentation)					25
Preparation for seminars/labs, homework, papers, portfolios and essays					25
Tutorship					10
Evaluations					3
Other activities:					
<b>3.7. Total individual study hours</b>			<b>83</b>		
<b>3.8. Total hours per semester</b>			<b>125</b>		
<b>3.9. Number of ECTS credits</b>			<b>5</b>		

#### 4. Prerequisites (if necessary)

4.1. curriculum	no need
4.2. competencies	no need

#### 5. Conditions (if necessary)

5.1. for the course	<ul style="list-style-type: none"> <li>The students will have access to databases (acquired by the faculty/ university/ main library)</li> <li>The interactive participation is encouraged</li> <li>The mobile phones should be off during the lecture</li> </ul>
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5.2. for the seminar /lab activities	<ul style="list-style-type: none"> <li>The mobile phones should be off during seminars</li> <li>No delay is permitted</li> </ul>
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## 6. Specific competencies acquired <sup>1</sup>

Professional/essential competencies	<ul style="list-style-type: none"> <li>C6. Identification, definition and development of a research subject in the field of Chemistry and Chemical Engineering.</li> <li>C6.1 Extended bibliographic study regarding the chosen research subject, organizing and synthesizing the acquired data in connection with the specific terminology; acquiring and using general and specific research methods.</li> <li>C6.2 Using specialized knowledge for choosing the suitable research strategy, realizing the experimental work and interpreting the obtained results.</li> <li>C6.3 Using suitable research concepts and methodology for new approach in the chemical synthesis and environmental protection.</li> <li>C6.4 Selection and using the appropriate research methods for a correct assessment of the obtained results and pertinent conclusions.</li> <li>C6.5. Using fundamental and applied concepts in realizing and developing a research project.</li> </ul>
Transversal competencies	<ul style="list-style-type: none"> <li>CT.1. Executing complex professional duties, by respecting the ethical, moral and specific rules, by following a personal research plan and proposing innovative solutions to the specific problems.</li> <li>CT.2. Planning, monitoring and assuming the professional duties of one or more professional supervised groups. Acquiring theoretical skills in coordinating a research group, by analytical general view, adaptability and flexibility, cooperation with the whole research team.</li> </ul>

## 7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	<ul style="list-style-type: none"> <li>The objectives of the lecture are:</li> <li>Becoming familiar with general terms about the scientific research;</li> <li>Presenting the ethic and the correct behaviour in research;</li> <li>information about scientific specialized bibliographic search;</li> <li>elaborating a research project;</li> <li>writing a scientific work/ paper.</li> </ul>
7.2 Specific objective of the discipline	<ul style="list-style-type: none"> <li>Research as human activity. Scientific methods. Fundamental and applied research. Frontier and integrated research.</li> <li>Motivation and qualification of researchers. Research environment. Ethical and the correct behaviour in research.</li> <li>Scientific papers and literature search. Reading a scientific paper. Writing a scientific paper.</li> <li>Scientific research in Romania.</li> </ul>

<sup>1</sup> One can choose either competences or learning outcomes, or both. If only one option is chosen, the row related to the other option will be deleted, and the kept one will be numbered 6.



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## 8. Content

8.1 Course	Teaching methods	Remarks
1. Research as human activity. Scientific methodology. Fundamental and applied research. Frontier and integrated research. Risks for a non-valuable research.	lecture, explanation, conversation, description	1 hour
2. Motivation and qualification of a researcher.	lecture, explanation, conversation, description	1 hour
3. Research environment: why, who, what, where, when research is made.	lecture, explanation, conversation, description	1 hour
4. Ethics and correct research conduct: (a) Deviations from ethics: data production; data falsification; plagiarism.	lecture, explanation, conversation, description	1 hour
5. Ethics and correct research conduct: (b) Publication of the results: the quality of author / co-author; (c) Conflict of interests; (d) Ethical codes of universities, societies and scientific publications.	lecture, explanation, conversation, description	1 hour
6. Scientific publications and documenting: (a) Types of publications; (b) Ranking of scientific publications. Impact factor.	lecture, explanation, conversation, description	1 hour
7. Scientific publications and documenting: (c) Types of scientific papers; (d) Data bases. Electronic information sources; Internet.	lecture, explanation, conversation, description	1 hour
8. Writing a research project. Current level of knowledge in the field.	lecture, explanation, conversation, description	1 hour
9. Writing a research project. Objectives and methodology.	lecture, explanation, conversation, description	1 hour
10. Reading a scientific paper.	lecture, explanation, conversation, description	1 hour
11. Writing a scientific paper.	lecture, explanation, conversation, description	1 hour
12. Presenting a scientific paper. (seminar, conference).	lecture, explanation, conversation, description	1 hour
13. Scientific research in Romania: (a) Laws, organization, financing; (b) Main „Actors” in the Romanian scientific research (institution) and „geography” (territorial repartition) of research.	lecture, explanation, conversation, description	1 hour
14. Scientific research in Romania: (c) International visibility of the Romanian scientific research; (d) European context. Institutions, programs.	lecture, explanation, conversation, description	1 hour
Bibliography		
1. H. Selye, <i>De la vis la descoperire</i> , Editura Medicala, Bucuresti, 1968.		
2. M.S. Radulescu, <i>Metodologia cercetării științifice</i> , Ed. Didactică și Pedagogică, București, 2006.		
3. C. Enăchescu, <i>Tratat de teoria cercetării științifice</i> , Editura Polirom, București, 2005.		
4. Research ethics, in , <a href="http://www.en.wikipedia.org/wiki/research_ro">http://www.en.wikipedia.org/wiki/research_ro</a>		
5. Research methodology, in <a href="http://www.en.wikipedia.org/wiki/research_methodology">www.en.wikipedia.org/wiki/research_methodology</a>		



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6. Asociația Ad Astra – “ <i>Evaluarea cercetării științifice</i> ”, revista Ad Astra, nr. 4/2005. 7. Legea nr. 206/2004 privind buna conduită în cercetarea științifică, dezvoltarea tehnologică și inovare. 8. Lecture material (ppts and pdf format).		
8.2 Seminar / laboratory	Teaching methods	Remarks
1. Using the data-bases and the primary scientific sources.	explanation, conversation, description	2 hours
2. Documenting from data-bases and scientific papers for a specific research subject.	explanation, conversation, description	2 hours
3. Use of original scientific literature (articles) in dealing with a specific research topic.	explanation, conversation, description	2 hours
4. Use patents in dealing with a specific research topic.	explanation, conversation, description	2 hours
5. Writing a research project. Level of knowledge in the field.	explanation, conversation, description	2 hours
6. Writing a research project. Objectives and research methodology.	explanation, conversation, description	2 hours
7. Writing a research project. Attracting funds and using them.	explanation, conversation, description	2 hours
8. Writing a scientific article. Abstract + Introduction.	explanation, conversation, description	2 hours
9. Writing a scientific article. Original contributions. Results and discussions.	explanation, conversation, description	2 hours
10. Writing a scientific article. Conclusions.	explanation, conversation, description	2 hours
11. Developing an application for patenting research results.	explanation, conversation, description	2 hours
12. Presentation of the poster.	explanation, conversation, description	2 hours
13. Presentation of the research project.	explanation, conversation, description	2 hours
14. Presentation of the written scientific manuscript (colloquium)	explanation, conversation, description	2 hours

**9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program**

- By acquiring the theoretical and applied skills included in the content of the discipline “Research Methodology and Ethics” the students are acquiring consistent knowledge, corresponding to the competences specified in the Diploma Supplement and the potential jobs from ANC.

**10. Evaluation**

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course	<ul style="list-style-type: none"> <li>Quality of the given answers – appropriate acquiring and understanding of the subjects presented during the lectures.</li> </ul>	<ul style="list-style-type: none"> <li>Answers to the exam/seminar</li> <li>Appeals would be solved by the appointed staff</li> </ul>	70%



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10.5 Seminar/laboratory	<ul style="list-style-type: none"><li>Quality of the given answers – appropriate acquiring and understanding of the subjects presented during the seminars.</li><li>Quality of the prepared personal work</li></ul>	<ul style="list-style-type: none"><li>Solved subjects for each seminar</li></ul>	30%
10.6 Minimum standard of performance			
<ul style="list-style-type: none"><li>Mark 5 (five).</li></ul>			

#### 11. Labels ODD (Sustainable Development Goals)<sup>2</sup>

	
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Date:  
09.04.2025

Signature of course coordinator

Signature of seminar coordinator

Date of approval:  
15.04.2025

Signature of the head of department

<sup>2</sup> Keep only the labels that, according to the [Procedure for applying ODD labels in the academic process](#), suit the discipline and delete the others, including the general one for Sustainable Development – if not applicable. If no label describes the discipline, delete them all and write „Not applicable.”.