

## FIȘA DISCIPLINEI

### 1. Data about program

1.1 Institution	Babeș-Bolyai University, Cluj-Napoca
1.2 Faculty	Chemistry and Chemical Engineering
1.3 Department	Chemical Engineering
1.4 Studies domain	Chemical Engineering
1.5 Studies cycle	Master
1.6 Studies Program / Qualification	All lines of studies / master degree

### 2. Data about the discipline

2.1 Name of discipline	<b>Research Methodology and Ethics – CME6132 (CA, CCl, CCr, IMPM, IPOB, ICAP, PCA, CINB, TMSC)</b>						
2.2 Appointed person for lecture	Acad. Prof. Dr. Cristian Silvestru						
2.3 Appointed person for seminar	Acad. Prof. Dr. Cristian Silvestru Prof. Dr. ing. Anca Silvestru						
2.4 Year of studies	I	2.5 Semester	2	2.6. Type of evaluation	C	2.7 Discipline regime	DF/Md. <sup>a</sup>

<sup>a</sup>Md = mandatory

### 3. Total time estimated (hours per semester, didactic activities)

3.1 Hours per week	3	Of which: 3.2 lecture	1	3.3 seminar/laboratory	2
3.4 Total No. of hours in the studies plan	42	Of which: 3.5 lecture	14	3.6 seminar/laboratory	28
Distribution of time :					h
Studies upon manual, lecture support, bibliography and personal notes					10
Supplementary documentation in library or on specialized websites					15
Preparation of seminars/ themes, reports, essays					30
Tutorial activities					10
Exams (oral)					18
Other: .....					-
3.7 Total hours of individual study	83				
3.8 Total hours per semester	125				
3.9 Number of credit points	5				

### 4. Preliminary conditions (where applied)

4.1 of curricula	<ul style="list-style-type: none"> <li>no need</li> </ul>
4.2 of competencies	<ul style="list-style-type: none"> <li>no need</li> </ul>

### 5. Conditions (where applied)

5.1 For lecture	<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>
5.2 For seminar/ practical work	<ul style="list-style-type: none"> <li>The mobile phones should be off during seminars</li> <li>No delay is permitted</li> </ul>

## 6. Specific competences acquired

<b>Professional competences</b>	<b>C5. Identification, definition and development of a research subject in the field of Chemistry and Chemical Engineering.</b> <ul style="list-style-type: none"> <li>C5.1 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>C5.2 Using specialized knowledge for choosing the suitable research strategy, realizing the experimental work and interpreting the obtained results.</li> <li>C5.3 Using suitable research concepts and methodology for new approach in the chemical synthesis and environmental protection.</li> <li>C5.4 Selection and using the appropriate research methods for a correct assessment of the obtained results and pertinent conclusions.</li> <li>C5.5. Using fundamental and applied concepts in realizing and developing a research project..</li> </ul>
<b>Crosswise competences</b>	<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. Specific objectives (pointed out from the acquired competences)

7.1 General objectives	<p>The objectives of the lecture are:</p> <ul style="list-style-type: none"> <li>Becoming familiar with general terms about the scientific research;</li> <li>Presenting the ethic and the correct behavior 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 objectives	<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 behavior 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>

## 8. Content

8.1 Lecture	Metode de predare	Observații
<b>1.</b> 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
<b>2.</b> Motivation and qualification of a researcher.	lecture, explanation, conversation, description	1 hour
<b>3.</b> Research environment: why, who, what, where, when research is made.	lecture, explanation, conversation, description	1 hour
<b>4.</b> Ethics and correct research conduct: (a) Deviations from ethics: data production; data falsification; plagiarism.	lecture, explanation, conversation, description	1 hour
<b>5.</b> Ethics and correct research conduct: (b) Publication of the results: the quality of author / co-author; (c)	lecture, explanation, conversation, description	1 hour

Conflict of interests; (d) Ethical codes of universities, societies and scientific publications.		
<b>6.</b> Scientific publications and documenting: (a) Types of publications; (b) Ranking of scientific publications. Impact factor.	lecture, explanation, conversation, description	1 hour
<b>7.</b> Scientific publications and documenting: (c) Types of scientific papers; (d) Data-bases. Electronic information sources; Internet.	lecture, explanation, conversation, description	1 hour
<b>8.</b> Writing a research project. Current level of knowledge in the field.	lecture, explanation, conversation, description	1 hour
<b>9.</b> Writing a research project. Objectives and methodology.	lecture, explanation, conversation, description	1 hour
<b>10.</b> Reading a scientific paper.	lecture, explanation, conversation, description	1 hour
<b>11.</b> Writing a scientific paper.	lecture, explanation, conversation, description	1 hour
<b>12.</b> Presenting a scientific paper. (seminar, conference).	lecture, explanation, conversation, description	1 hour
<b>13.</b> Scientific research in Romania: (a) Laws, organization, financing; (b) Main „Actors” in the Romanian scientific research (institution) and „geography” (teritorial repartition) of research.	lecture, explanation, conversation, description	1 hours
<b>14.</b> Scientific research in Romania: (c) International visibility of the Romanian scientific research; (d) European context. Institutions, programs.	lecture, explanation, conversation, description	2 hours

#### References (mandatory)

1. H. Selye, *De la vis la descoperire*, Editura Medicala, Bucuresti, 1968.
2. M.S. Radulescu, *Metodologia cercetării științifice*, Ed. Didactică și Pedagogică, București, 2006.
3. C. Enăchescu, *Tratat de teoria cercetării științifice*, Editura Polirom, București, 2005.
4. Research ethics, in , [http://www.en.wikipedia.org/wiki/research\\_ro](http://www.en.wikipedia.org/wiki/research_ro)
5. Research methodology, in [www.en.wikipedia.org/wiki/research\\_methodology](http://www.en.wikipedia.org/wiki/research_methodology)
6. Asociația Ad Astra – “*Evaluarea cercetării științifice*”, revista Ad Astra, nr. 4/2005.
7. Legea nr. 206/2004 privind buna conduită în cercetarea științifică, dezvoltarea tehnologică și inovare.

#### References (optional)

1. Ionel Haiduc: Cercetarea științifică din România în context internațional. Evoluții recente. Colaborări internaționale, *Academica*, Anul XII, Nr. 2-3, Mai-iunie 2002, p. 56-59.
2. Ionel haiduc: Aspecte etice ale cercetării științifice în chimie, biologie și medicină, *Revista d Politica Științei și Scientometrie* 2005, 3(1) 37-42.

8.2 Seminar	Teaching methods	Observation
<b>1.</b> Using the data-bases and the primary scientific sources.	explanation, conversation, description	2 hours
<b>2.</b> Documenting from data-bases and scientific papers for a specific research subject.	lecture, explanation, conversation, description	2 hours
<b>3.</b> Use of original scientific literature (articles) in dealing with a specific research topic.	lecture, explanation, conversation, description	2 hours
<b>4.</b> Use patents in dealing with a specific research topic.	lecture, explanation, conversation, description	2 hours
<b>5.</b> Writing a research project. Level of knowledge in the field.	explanation, conversation, description	2 hours
<b>6.</b> Writing a research project. Objectives and research methodology.	explanation, conversation, description	2 hours
<b>7.</b> Writing a research project. Attracting funds and	explanation, conversation,	2 hours

using them.	description	
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. Prezentarea unui 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)	Oral examination	2 hours

**9. Relationship between the content of the specific discipline with the requirements of the epistemic community, profesional associations and potential employers.**

- 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.

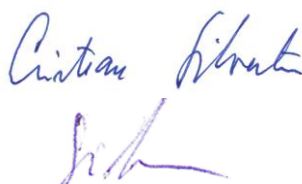
**10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Contribution to the final mark
10.4 Colloquium	<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>	60%
10.5 Seminar	<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>	40%
10.6 Minimum standard of performance			
<ul style="list-style-type: none"> <li>Mark 5 (five).</li> </ul>			

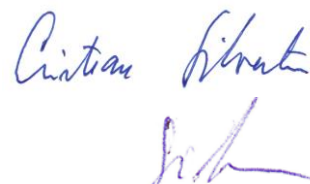
Date,

April 14, 2021

Signature,  
Appointed person for lecture



Signature,  
Appointed person for seminar



Date,  
Approval in Department

April 14, 2021

Signature,  
Head of Chemistry Department

Acad. Cristian Silvestru

