

FIȘA DISCIPLINEI

1. Data about program

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| 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

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|----------------------------------|--|--------------|---|-------------------------|---|-----------------------|-----------------|
| 2.1 Name of discipline | Research Methodology and Ethics – CME6138 (CA, CCl, CCr, IMPM, IPOB, ICAP, PCA, CINB, TMSC) | | | | | | |
| 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 | SD ^a |

^aSD = specialized discipline

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

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| 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)

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

5. Conditions (where applied)

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| 5.1 For lecture | <ul style="list-style-type: none"> The students will have access to databases (acquired by the faculty/ university/ main library) The interactive participation is encouraged The mobile phones should be off during the lecture |
| 5.2 For seminar/ practical work | <ul style="list-style-type: none"> The mobile phones should be off during seminars No delay is permitted |

6. Specific competences acquired

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

7. Specific objectives (pointed out from the acquired competences)

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

8. Content

| 8.1 Lecture | Metode de predare | Observații |
|---|---|------------|
| 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 | lecture, explanation, | 1 hour |

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| of the results: the quality of author / co-author; (c) Conflict of interests; (d) Ethical codes of universities, societies and scientific publications. | conversation, description | |
| 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” (teritorial repartition) of research. | lecture, explanation, conversation, description | 1 hours |
| 14. 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
5. Research methodology, in 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 |
|---|---|-------------|
| 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. | lecture, explanation, conversation, description | 2 hours |
| 3. Use of original scientific literature (articles) in dealing with a specific research topic. | lecture, explanation, conversation, description | 2 hours |
| 4. Use patents in dealing with a specific research topic. | lecture, 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 |

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| 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. 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.

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| <ul style="list-style-type: none"> By acquiring the theoretical and applied skills included in the content of the discipline “<i>Research Methodology and Ethics</i>” the students are acquiring consistent knowledge, corresponding to the competences specified in the Diploma Supplement and the potential jobs from ANC. |
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10. Evaluation

| Type of activity | 10.1 Evaluation criteria | 10.2 Evaluation methods | 10.3 Contribution to the final mark |
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| 10.4 Colloquium | <ul style="list-style-type: none"> Quality of the given answers – appropriate acquiring and understanding of the subjects presented during the lectures. | <ul style="list-style-type: none"> Answers to the exam/seminar Appeals would be solved by the appointed staff | 60% |
| 10.5 Seminar | <ul style="list-style-type: none"> Quality of the given answers – appropriate acquiring and understanding of the subjects presented during the seminars. Quality of the prepared personal work | <ul style="list-style-type: none"> Solved subjects for each seminar | 40% |
| 10.6 Minimum standard of performance | | | |
| <ul style="list-style-type: none"> Mark 5 (five). | | | |

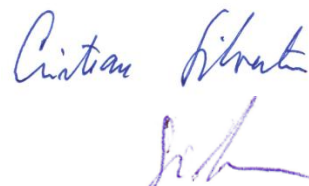
Date,

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

