

## COURSE SYLLABUS

### 1. Information about the study program

1.1 University	“Babeş-Bolyai” University
1.2 Faculty	Faculty of Chemistry and Chemical Engineering
1.3 Department	Department of Chemical Engineering
1.4 Field of study	Chemical Engineering
1.5 Program level (BA or MA)	Master
1.6 Study program / Qualification	Advanced Chemical Process Engineering

### 2. Information about the subject

2.1 Subject title	<b>Practical Activities of Research - Development– CME7342</b>						
2.2 Course activities professor	Scientific advisor of the dissertation						
2.3 Seminar activities professor	Scientific advisor of the dissertation						
2.4 Year of study	II	2.5 Semester	4	2.6. Type of assessment	CA	2.7 Subject regime	DS/Obl.

### 3. Total estimated time (teaching hours per semester)

3.1 Number of hours per week	9	Out of which: 3.2 course	-	3.3 seminar / laboratory	9
3.4 Total number of hours in the curriculum	126	Out of which: 3.5 course	-	3.6 seminar / laboratory	126
Time distribution:					hours
Study based on textbook, course packet, references and lecture notes					14
Additional research in the library, on specialist electronic platforms (databases) and through field activities.					28
Preparing seminar/laboratory work, homework, reports, portfolios and essays.					79
Tutoring					-
Assessment (examinations)					3
Other activities					-
3.7 Total hours for individual study	124				
3.8 Total hours per semester	250				
3.9 Number of credits	10				

#### 4. Pre-requisites (where applicable)

4.1 Curriculum	<ul style="list-style-type: none"><li>• Not applicable</li></ul>
4.2 Competences	<ul style="list-style-type: none"><li>• Not applicable</li></ul>

#### 5. Conditions (where applicable)

5.1 For course development	<ul style="list-style-type: none"><li>• Not applicable</li></ul>
5.2 For seminar/laboratory development - applications	<ul style="list-style-type: none"><li>• The students will attend the program research- development practical activities established by the scientific advisor of the dissertation.</li><li>• The students will prepare the documentation using the existing sources both in the specialized libraries, in the international electronic databases, and in those provided by the scientific advisor of the dissertation.</li><li>• The students will attend the laboratory with safety equipment (overall, gloves, goggles).</li><li>• The students will know the goals, means, stages of the laboratory works they are going to attend.</li><li>• The reports / reviews will be presented and delivered to the scientific advisor of the dissertation.</li></ul>

#### 6. Specific competences

<b>Professional competences</b>	<ul style="list-style-type: none"><li>• Identifying and defining a research-development subject / topic in the area of chemical process engineering, elaborating and implementing a plan of achievement of the proposed goals and capitalizing the results obtained from the scientific research..</li><li>• Applying the thorough knowledge and the specific research methods in the chemical processes engineering.</li><li>• Detailed and pertinent use of the experiment as an evaluation and foundation method of evaluation of the decisions.</li><li>• Designing, executing and capitalizing the results of the scientific research specific to process engineering.</li></ul>
---------------------------------	---

<b>Transversal competences</b>	<ul style="list-style-type: none"> <li>• Preparing independently complex professional tasks and autonomous development of research-design activities, using computer assisted technology and complying with the norms of professional ethics and moral conduct.</li> <li>• Demonstrating the capacity of coordination of the activity, analytical thinking, adaptability and flexibility.</li> <li>• Self-assessment of the professional efficiency and establishing the needs of continuous formation, permanent information and documentation in the field of activity and related areas, in correlation with the needs of the labour market.</li> <li>• Capacity to conceive and prepare a scientific paper.</li> <li>• Capacity to defend a scientific presentation in a foreign language.</li> </ul>
--------------------------------	---

### 7. Course objectives and learning outcomes (deriving from the acquired competences)

7.1 Subject's general objective	<ul style="list-style-type: none"> <li>• Development of the capacity and competences of application of the chemical process engineering knowledge in the realization of the proposed goals in the chosen research subject in order to achieve original results and capitalize the results of the scientific research</li> </ul>
7.2 Specific objectives	<ul style="list-style-type: none"> <li>• Achievement of the proposed research plan by preparing the experimental research works/elaboration of original applications.</li> <li>• Use of the specialized knowledge to establish the research strategy and the program of original experiments and simulations, explanation and partial interpretation of results.</li> <li>• Use of the conceptual and methodological research apparatus in order to develop new/original theoretical approaches and products/technology with practical applications.</li> <li>• Proper selection and use of the evaluation methods for the pertinent interpretation of the original results of the research by formulating conclusions and arguing the proposed solutions.</li> <li>• Use of fundamental and applicative concepts in the development of the research projects.</li> </ul>

### 8. Content

8.1 Laboratory	Teaching methods	Observations
8.1.1. Preparation of the experimental activities/applications for the achievement of the originality elements in the dissertation.	Explanation; Conversation; Description; Conceptualization	12

8. 1.2. Achievement of the experimental activities/original applications.	Explanation; Conversation; Description; Conceptualization	62
8. 1.3. Collection and interpretation of original experimental data/results of original applications.	Explanation; Conversation; Description; Conceptualization	12
8.1.4. Analysis and systematization of original experimental results/results of original applications.	Explanation; Conversation; Description; Conceptualization	12
8. 1. 5. Underlying the relevance of the original results obtained in the context of the literature.	Explanation; Conversation; Description; Conceptualization	12
8. 1. 6. Hearing scientific defenses (conferences, symposiums, public defenses of doctoral theses).	Explanation; Conversation; Description; Conceptualization	6
8. 1. 7. Presentation of the final experimental results/final results of the applications.	Explanation; Conversation; Description; Conceptualization	8

#### References

1. Bibliographical sources mentioned in the course syllabus of the curriculum for the ICAP program.
2. Chemical Abstracts Analytical Abstracts, Beilstein.
3. Electronic databases (Science Direct, Scopus, SpringerLink, Web of Science, Wiley Journals, Proquest Journals, etc.)
4. The bibliographical sources indicated by the scientific advisor of the dissertation paper.

Note: The bibliographical elements can be consulted at the Library of the Department of Chemical Engineering, at the Library of the Faculty of Chemistry and Chemical Engineering – extension of the “Lucian Blaga” Central Library of the “Babeş-Bolyai” University., and the “Lucian Blaga” Central Library.

#### **9. Corroboration / validation of the subject’s content in relation to the expectations coming from representatives of the epistemic community, of the professional associations and of the representative employers in the program’s field**

- The content of the discipline is in agreement with the partial competences required for the possible occupations provided in the Grid 1M – Description of the program of studies by professional and transversal competences RNCIS.

### 10. Assessment (examination)

Type of activity	10.1 Assessment criteria	10.2 Assessment methods on-line or on-site	10.3 Weight in the final grade
10.5 Seminar / laboratory	Development of the appropriate methods, techniques and instruments for the preparation and achievement of the research objectives with original character.	Evaluation of the techniques and instruments chosen for preparing and achieving the research objectives with original character	10%
	Method of execution of the scientific papers with original character, collection and interpretation of final experimental data / final application results.	Evaluation of the manner of execution of the scientific papers with original character, collection and interpretation of final experimental data / final application results.	60%
	Correctness, completeness and argumentation of the analysis and systematization of the obtained original results	Evaluation of the correctness, completeness and argumentation of the analysis and systematization of the obtained original results	10%
	Presentation of the report / review with the final experimental data / final applications according to the chosen research topic.	Evaluation of the paper presentation with final experimental data/final application results.	10%
10.6 Minimum performance standards			
<ul style="list-style-type: none"> <li>• The mark 5 (five) for the evaluation of each of the evaluation criteria.</li> <li>• Knowledge of the main means of research documentation in the field of computer assisted chemical process engineering.</li> </ul>			

Date of filling  
10.04.2021

Signature of the  
course professor

Signature of the  
seminar professor

Signature of the scientific  
advisor of the dissertation

Date of approval  
by the Department  
April 25, 2021

Head of Department  
signature

Prof. dr. ing. Turdean Graziella