

## 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>Development activities-applications I – CME6117</b>						
2.2 Course activities professor	Scientific advisor of the dissertation paper						
2.3 Seminar activities professor	Scientific advisor of the dissertation paper						
2.4 Year of study	1	2.5 Semester	1	2.6. Type of assessment	CA	2.7 Subject regime	DS/Ob

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

3.1 Number of hours per week	6	Out of which: 3.2 course	-	3.3 seminar / laboratory	6
3.4 Total number of hours in the curriculum	84	Out of which: 3.5 course	-	3.6 seminar / laboratory	84
Time distribution:					
Study based on textbook, course packet, references and lecture notes					6
Additional research in the library, on specialist electronic platforms (databases) and through field activities.					22
Preparing seminar/laboratory work, homework, reports, portfolios and essays.					10
Tutoring					-
Assessment (examinations)					3
Other activities					-
3.7 Total hours for individual study	41				
3.8 Total hours per semester	125				
3.9 Number of credits	5				

**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 of preparation of the dissertation paper 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, phases of preparation of the dissertation paper</li> <li>• The papers will be delivered to the scientific advisor or of dissertation paper</li> </ul>

**6. Specific competences**

<b>Professional competences</b>	<ul style="list-style-type: none"> <li>• Identifying and defining a research subject in the area of chemical process engineering, elaboration and implementation of a plan to achieve the proposed objectives, and capitalization of the results of 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 assessment method and foundation of the decisions.</li> <li>• Designing, executing and capitalizing the results of the scientific research specific to process engineering.</li> </ul>
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<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>• Ability to conceive and prepare a scientific paper.</li> <li>• Ability to defend a scientific presentation in a foreign language.</li> </ul>
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## 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 by specific documentation means of the capacity and competences of applying the chemical process engineering knowledge in the realization of the proposed research goals in order to achieve and capitalize the presumed results of the scientific research</li> </ul>
7.2 Specific objectives	<ul style="list-style-type: none"> <li>• Selection and realization of an extended research of the data in the literature corresponding to the research subject, organization and synthesis of the data by acquiring the domain-specific terminology; knowledge of the general and specific research methods.</li> <li>• Use of the specialized knowledge to establish the research strategy and the program of experiments and simulations, explanation and interpretation of results.</li> <li>• Use of the conceptual and methodological research apparatus to develop new/original theoretical approaches and products/technology with practical applications.</li> <li>• Proper selection and use of the assessment methods for the pertinent interpretation of the research results by drawing 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. Initiation for the purpose of documentation in specialized libraries (printed format).	Explanation; Conversation; Description; Conceptualization	12
8. 1.2. Initiation, accessing of electronic international documentation sources (Science Direct, Scopus, SpringerLink, Web of Science, Wiley Journals, Proquest Journals, etc.).	Explanation; Conversation; Description; Conceptualization	12
8. 1.3. Achievement of documentation in the field of the master program in specialized (selected) libraries, computer assisted chemical process engineering, thoroughness of the physical chemistry knowledge, electro-chemical and material processes; heat integration; intensification of chemical processes; depolluting processes and green chemistry; heat integration; risk and quality management.	Explanation; Conversation; Description; Conceptualization	12
8.1.4. Realization of the documentation in the area of the master program by accessing international (selected) electronic databases: computer assisted chemical engineering process; thoroughness of the physical chemistry knowledge, electro-chemical and material processes; heat integration; intensification of chemical processes; mathematic modeling; acquisition of experimental data; evolved process conducting; depolluting processes and green chemistry; heat integration; risk and quality management.	Explanation; Conversation; Description; Conceptualization	12
8. 1. 5. Systematization of the information accessed in the literature.	Explanation; Conversation; Description; Conceptualization	12
8. 1. 6. Presentation of the papers with the data from the literature.	Explanation; Conversation; Description; Conceptualization	12
8. 1. 7. Presentation of the portfolio of the dissertation subjects and selection of the subject with the scientific advisor.	Explanation; Conversation; Description; Conceptualization	12
<b>References</b> <ol style="list-style-type: none"> <li>1. Bibliographical sources mentioned in the course syllabus of the curriculum for the ICAP program.</li> <li>2. Chemical Abstracts, Analytical Abstracts, Beilstein.</li> <li>3. Electronic databases (Science Direct, Scopus, SpringerLink, Web of Science, Wiley Journals, Proquest Journals, etc.)</li> <li>4. The bibliographical sources indicated by the scientific advisor of the dissertation..</li> </ol> <p>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.</p>		

**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**

<ul style="list-style-type: none"> <li>The content of the syllabus is in agreement with the partial competences required for the possible occupations and the competences and qualifications have been established in accordance with the competences in the Diploma Supplement and the qualifications of the NCA.</li> </ul>
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**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	Presentation of the papers with the data from the literature.	Elaboration and presentation of the papers with the data from the literature.	40%
	Acquiring the documentation method	Assessment of the various methods of documentation. .	10%
	Correctness, completeness, and argumentation of the systematization of the information collected from the specialized literature.	Evaluation of the correctness, completeness, and argumentation of the systematization of the information collected from the literature.	30%
	Integration of the documentation of the literature data collected with the selected dissertation subject	Evaluation of the integration of the documentation of the literature data collected with the selected dissertation subject.	20%
10.6 Minimum performance standards			
<ul style="list-style-type: none"> <li>The mark 5 (five) for the assessment of each of the assessment criteria.</li> <li>Knowledge of the main means of documentation for the research in the field of computer assisted chemical process engineering.</li> </ul>			

Date of filling  
10.04.2023

Signature of the  
course professor

Signature of the  
seminar professor

Signature of the scientific advisor  
of the dissertation

Date of approval by  
the Department  
25.04.2023

Head of Department signature  
Prof. dr. ing. Turdean Graziella

