SYLLABUS

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[1]/ Department [2]	Chemical Engineering, Biotechnologies and Environmental Protection / CAICAM
1.3 Field of study (name/code[3])	Chemical Engineering / 10.30.50
1.4 Study cycle	License
1.5 Study program (name/code/qualification)	Chemical Engineering / 10.30.50.60 / engineer

2. Information about the discipline

2.1 Name of discipline/ formative category[4]			Principles of chemical engineering / DD				
2.2 Coordinator (holder) of course activities			Conf.dr.ing. Giannin MOȘOARCĂ				
2.3 Coordinator (holder) of applied activities[5]			Conf.dr.ing. Giannin MOȘOARCĂ				
2.4 Year of study[6]	III	**2.5** Semester	5	**2.6** Type of evaluation	D	**2.7** Regime of discipline[7]	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [8]

3.1 Number of fully assisted hours / week	4 of which:	**3.2** course	2	**3.3** seminar / laboratory / project	0/2/0
3.1* Total number of fully assisted hours / semester	56 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	0/28/0
3.4 Number of hours partially assisted / week	of which:	**3.5** training		**3.6** hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	**3.5*** training		**3.6*** hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	3.14 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.64
		hours of individual study after manual, course support, bibliography and notes			1.25
		training seminars / laboratories, homework and papers, portfolios and essays			1.25
3.7* Number of hours of unassisted activities / semester	44 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			9
		hours of individual study after manual, course support, bibliography and notes			17.5
		training seminars / laboratories, homework and papers, portfolios and essays			17.5
3.8 Total hours / week [9]	7.14				
3.8* Total hours /semester	100				
3.9 Number of credits	4				

4. **Prerequisites** (where applicable)

4.1 Curriculum	•
4.2 Competencies	•

[1] The name of the faculty which manages the educational curriculum to which the discipline belongs
[2] The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.
[3] The code provided in HG - on the approval of the Nomenclature of fields and specializations / study programs, annually updated.
[4] Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).
[5] Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[6] Year of studies in which the discipline is provided in the curriculum.
[7] Discipline may have one of the following regimes: imposed discipline (DI) or compulsory discipline (DOb)-for the other fundamental fields of studies offered by UPT, optional discipline (DO) or optional discipline (Df).
[8] The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.
[9] The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

5. Conditions (where applicable)

5.1 of the course	• Students will participate in the course, which is interactive, and can ask questions about the content of the lecture. Classroom equipped with video projector, blackboard
5.2 to conduct practical activities	• Laboratory equipped according to requirements, with specific specializes equipment

6. Specific competencies acquired through this discipline

Specific competencies	• Definition of notions, concepts, theories and basic models in the field of chemistry and engineering and their appropriate use in professional communication • Using basic knowledge in the field of chemistry and chemical engineering to explain and interpret engineering phenomena • Identification and application of concepts, methods and theories for solving typical chemical process engineering problems under conditions of qualified assistance • Critical analysis and use of working principles, methods and techniques for the quantitative and qualitative assessment of chemical engineering processes • Application of fundamental concepts and theories in the field of chemistry and chemical and process engineering for the development of professional projects • Description of concepts, theories and basic methods of exploiting reactors and industrial chemical processes • Explaining and interpreting the principles and methods used in the exploitation of industrial processes and installations • Critical evaluation of processes, equipment, procedures and products in the chemical industry • Elaboration of professional projects for technologies in the field of chemical engineering • The ability to solve balance sheet problems associated with industrial processes • Ability to use acquired concepts to establish the structure of an industrial process and technological flow, separation subsystems and heat exchanger networks • The ability to use laboratory facilities to collect the data necessary to prepare material balances and calculate the efficiency of the process
Professional competencies ascribed to the specific competencies	• - Analyse production processes for improvement; • - Manage chemical testing procedures; • - Test materials; • - Write technical reports • -Performs chemical experiments • -Approve engineering design • -Assess environmental impact

Transversal competencies ascribed to the specific competencies

- - Conduct quality control;
- - Apply scientific, technological and engineering knowledge;
- - Uses equipment, instruments or technological equipment accurately.

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7. Objectives of the discipline (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	• Acquiring some basic notions regarding the technological processes involved in chemical engineering
7.2 Specific objectives	• Knowledge of the fundamental notions in the field of chemistry and chemical engineering • The use of basic knowledge specific to chemical engineering for the characterization of technological processes • Solving balance sheet problems associated with industrial processes • Knowledge of the basics of chemical process management and safety

8. Content [10]

8.1 Course	Number of hours	Teaching methods [11]
General concepts of chemical engineering	4	Participatory lecture
Expertise areas of chemical engineers	2	
Basic technological calculations in chemical engineering (Material balance, Energy balance)	6	
Design and development of chemical processes and facilities	8	
Management and safety of chemical processes	4	
Sustainability in chemical engineering	4	
Bibliography [12] U.P. Nnaji, Introduction to Chemical Engineering (For Chemical Engineers and Students), John Wiley&Sons, 2019 R.M. Felder, R.W Rousseau, L.G. Bullard, Elementary Principles of Chemical Processes, 4th Edition, Wiley & Sons, 2018. D.M. Himmelblau, J.B. Riggs, Basic Principles and Calculations in Chemical Engineering, 8th Edition, Pearson, 2012. G. Mosoarca, Aluminiul rezidual in apa potabila, Editura Politehinca Timisoara, 2004		

8.2 Applied activities [13]	Number of hours	Teaching methods
Principles of chemical engineering - description of laboratory. General and specific OSH and SU rules	4	Participatory lecture Brainstorming Experiment
Material balance	12	
Energy balance	4	
Analysis of a discontinuous technological process	4	
Analysis of a continuous technological process	4	
Bibliography [14] U.P. Nnaji, Introduction to Chemical Engineering (For Chemical Engineers and Students), John Wiley&Sons, 2019 R.M. Felder, R.W Rousseau, L.G. Bullard, Elementary Principles of Chemical Processes, 4th Edition, Wiley & Sons, 2018. D.M. Himmelblau, J.B. Riggs, Basic Principles and Calculations in Chemical Engineering, 8th Edition, Pearson, 2012. G. Mosoarca, Aluminiul rezidual in apa potabila, Editura Politehinca Timisoara, 2004		

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- The content of the discipline contributes to the accumulation of 6 professional competencies specified in the National Register of Higher Education Qualifications, RNCIS, competencies established through prior consultation with representatives of the epistemic community, professional associations and representative employers in the field related to the program

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Description and application of chemical engineering	Exam – grid test (18 questions)	60%

[10] It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".

[11] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

[12] At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.

[13] Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".

[14] At least one title must belong to the discipline team.

[15] Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

	concepts		
10.5 Applied activities	**S:**		
	L: Involvement in carrying out the laboratory activity and the correctness of the results obtained	Discussions with students and checking laboratory reports	40%
	P[16]**:**		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [17])			
• Basic notions regarding the characterization of technological processes and the preparation of a material balance (correct answer to 9 questions from the grid test received in the exam			

Date of completion	**Course coordinator (signature)** Conf.dr.ing. Giannin MOȘOARCĂ	**Coordinator of applied activities (signature)** Conf.dr.ing. Giannin MOȘOARCĂ
Head of Department (signature) Conf.dr.ing. Andrea KELLENBERGER	**Date of approval in the Faculty Council** [18]	**Dean (signature)** Ș.L.dr.ing. Mircea Laurențiu DAN

[16] In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.
[17] It will not explain how the promotion mark is awarded.
[18] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.