

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 / CAICON
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	Transfer Phenomena III. Mass Transfer / DD						
2.2 Coordinator (holder) of course activities	S.L.dr.ing. Andra TĂMAȘ						
2.3 Coordinator (holder) of applied activities ⁵	S.L.dr.ing. Andra TĂMAȘ						
2.4 Year of study ⁶	III	2.5 Semester	6	2.6 Type of evaluation	E	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	0/1/1
3.1* Total number of fully assisted hours / semester	56 of which:	3.2* course	28	3.3* seminar / laboratory / project	0/14/14
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	1.36 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			
		hours of individual study after manual, course support, bibliography and notes			
		training seminars / laboratories, homework and papers, portfolios and essays			
3.7* Number of hours of unassisted activities / semester	19 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			
		hours of individual study after manual, course support, bibliography and notes			
		training seminars / laboratories, homework and papers, portfolios and essays			
3.8 Total hours / week ⁹	5.36				
3.8* Total hours /semester	75				
3.9 Number of credits	3				

4. Prerequisites (where applicable)

4.1 Curriculum	• Mathematics, Physics, Heat Transfer
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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.

4.2 Competencies	•
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5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> • Appropriately equipped classroom – blackboard, video projector, internet connection
5.2 to conduct practical activities	<ul style="list-style-type: none"> • Appropriately equipped laboratory. The students must be dressed with their lab coats and their mobile phones must be switched off. They will be trained and will respect the rules of labor protection and PSI.

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> • Knowing the analogy between heat and mass transfer • The principle and phenomenological description of the separation processes, the deduction of the calculation relationships for the main parameters that define the process, the calculation and construction of different types of devices, the analysis of the possibilities of intensification and optimization.
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> • - 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	<ul style="list-style-type: none"> • Ensure the basic knowledge regarding the separations based on mass transfer.
7.2 Specific objectives	<ul style="list-style-type: none"> • The use of basic knowledge of chemistry and chemical engineering to explain separation phenomena and processes. Definition of chemical engineering terms and their appropriate use in professional communication.

8. Content¹⁰

8.1 Course	Number of hours	Teaching methods ¹¹
Difussion processes: Difussion coefficients. Partial and total mass transfer coefficients and their criterion calculation. Diffusional separation.	3	Participatory lecture
Distillation&Rectification: Liquid-vapor equilibrium for ideal and real	7	

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.).

		necessary to perform calculations, interpreting the obtained results
Bibliography ¹⁴		
1. R. Minea, A. Tămaş, Transfer de masă-Aplicatii, Ed. De Vest, Timisoara, 2005		
2. C.F..Pavlov, P.G. Romankov, A.A. Noskov, Procese si aparate in ingineria chimica-Exercitii si probleme, Ed. Tehnica, Bucuresti, 1981		
3. J.R. Perry, D.W. Green, Perry's Chemical Engineer's Handbook, 7th Ed., Mc Graw-Hill International Edition, New York, 1998		
4. O. Floarea, G.Jinescu, C.Balaban, P.Vasilescu, R.Dima, Operatii si utilaje in industria chimica-Probleme, Ed. Didactica si Pedagogica, Bucuresti, 1980		
5. ***, Manualul Inginerului Chimist, vol. I si II, Ed. Tehnica, Bucuresti, 1973		
6. A. Tămaş, R. Minea, Uscarea-Aspecte teoretice si aplicative, Ed. Politehnica, Timisoara, 2006		

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

<ul style="list-style-type: none"> The topic of the subject is correlated with the curriculum of the corresponding subjects from other faculties in the country and abroad.
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10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁵	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Checking the correct and complete acquisition of the basic theoretical notions, the coherence, the logical correlation of the notions, the degree of involvement	Written exam lasting 3 hours. Half of the time is allocated to solving the applications, and the other half to the treatment of theoretical subjects.	60%
10.5 Applied activities	S:		
	L: The ability to operate with the notions learned in the course, the ability to calculate and interpret the obtained results, conscientiousness and seriousness	Checking the reports that include the experimentally determined data, the related calculations and the interpretation of the results, for each laboratory work performed. The interest shown by the student for the experimental determinations is counted. The grade for the laboratory activity represents 50% of the grade for the course activity.	20%
	P¹⁶: Calculation skills, the ability to search/use the necessary data in the bibliography provided, rigor and correctness in writing the material, coherent and correct presentation of the project.	The correctness of the calculations, the use of measurement units, the way of writing, the method of citing the references, the general aspect of the project are checked. Each student presents his project in front of the teaching staff and colleagues. The grade for the project represents 50% of the grade for the activity during the semester.	20%
	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)			
<ul style="list-style-type: none"> Minimum passing condition: performance of all laboratory work, elaboration and support of the project, minimum grade 5 in the laboratory, minimum grade 5 in the project, minimum grade 5 in the written exam. 			

Date of completion

Course coordinator
(signature)

S.L.dr.ing. Andra TĂMAŞ

Coordinator of applied activities
(signature)

S.L.dr.ing. Andra TĂMAŞ

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.)

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.

**Head of Department
(signature)**

S.L.dr.ing. Andra TĂMAȘ

Date of approval in the Faculty Council ¹⁸

**Dean
(signature)**

Ș.L.dr.ing. Mircea Laurențiu DAN

¹⁸ The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.