

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	Applied Informatics / DF						
2.2 Coordinator (holder) of course activities	Prof. dr. ing. Gabriela-Alina DUMITREL						
2.3 Coordinator (holder) of applied activities ⁵	Ș.I. dr. ing. Ana Maria PANĂ						
2.4 Year of study ⁶	I	2.5 Semester	1	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	5 of which:	3.2 course	2	3.3 seminar / laboratory / project	0/3/0
3.1* Total number of fully assisted hours / semester	70 of which:	3.2* course	28	3.3* seminar / laboratory / project	0/4/2/0
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	3.93 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.9
		hours of individual study after manual, course support, bibliography and notes			3
		training seminars / laboratories, homework and papers, portfolios and essays			1.5
3.7* Number of hours of unassisted activities / semester	55 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			13
		hours of individual study after manual, course support, bibliography and notes			21
		training seminars / laboratories, homework and papers, portfolios and essays			21
3.8 Total hours / week ⁹	8.93				
3.8* Total hours /semester	125				
3.9 Number of credits	5				

4. Prerequisites (where applicable)

4.1 Curriculum	• Not applicable
4.2 Competencies	• Elementary mathematical skills

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	<ul style="list-style-type: none"> Classroom provided with writing board, internet access and video-projector. The students' required attendance to course is established by Didactic activities regulations issued by Politehnica University Timișoara. During the class, the students would turn off their phones.
5.2 to conduct practical activities	<ul style="list-style-type: none"> Practical applications will be carried out in the Software applications Laboratory, provided with computers and internet access. Adequate software: Microsoft Office, ChemSketch and Matlab will be installed on each computer. Didactic activities regulations issued by Politehnica University Timișoara will be respected.

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> Recognition and understanding of main components of a computer system. Identification of the purpose and functions of a computer system and an operating system. Ability to use software dedicated to writing chemical formula, document editing, tabular calculus, graphic representation of data. Knowledge and understanding the principles of algorithm implementation. Ability to transform a problem into an algorithm. Ability to implement applications into Matlab program environment.
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.

<ul style="list-style-type: none">
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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"> Consolidation of fundamentals concerning the hardware, software and operating systems of computers. Good skills of using Microsoft Office, Word, Excel, Power Point and chemical editing programs, respectively. Basics programming. Good skills in Matlab programming.
7.2 Specific objectives	<ul style="list-style-type: none"> Ability to use Microsoft Office in writing, editing and presenting information from chemical field. Using Matlab in solving problems from chemical engineering field

8. Content ¹⁰

8.1 Course	Number of hours	Teaching methods ¹¹
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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.).

Computers and operating systems	6	Interactive teaching skills, lecture, demonstration, problem solving, cooperation teaching. Video-projector lecture and blackboard explanations for knowledge consolidation.
Scientific research using electronic resources	2	
Chemical formula editing software	2	
Microsoft Office applications: Word, Excel, Power Point	6	
Algorithms and logical schemes. Matlab programming environment - introduction	6	
Variables, vectors, matrix. Array operations in Matlab. Linear equations solving	3	
Matlab graphics (2D, 3D)	3	
Logical control ("if", "if-else", "for", "while"). M-files functions handling	3	

Bibliography ¹²

1. Dumitrel G.A., Utilizarea si programarea calculatoarelor, note de curs, disponibil online, <https://cv.upt.ro/course/view.php?id=4654>
2. Tanenbaum A., Modern operating systems (3rd ed.). Upper Saddle River, New Jersey: Prentice Hall Pearson Education International, 2009.
3. Lambert J., Lambert S., Windows 10 step by step, Microsoft Press, 2015.
4. ACD/ChemSketch 2018 1.1 reference manual, 2018.
5. Toncu G., Programarea calculatoarelor și limbaje de programare: Introducere în mediul de programare MATLAB. Constanța: Ovidius University Press, 2014.
6. Ghinea M., Fireșteanu V., MATLAB: Calcul numeric [MATLAB] : Grafică [MATLAB] (Calculatoare personale 74). București: Teora, 2003.
7. Todinca T., Geanta M., Modelarea si simularea proceselor chimice. Aplicatii in MATLAB, Timisoara: Politehnica, 1999.
8. Șipoș, A., Căpățână, C., Păcală, M. L., MATLAB: aplicații în inginerie, Editura Universității „Lucian Blaga” din Sibiu, 2019

8.2 Applied activities ¹³	Number of hours	Teaching methods
Computers: software and hardware components. Operating systems (Windows)	3	Teaching, examples, case studies, applications
Scientific research using electronic resources	3	
ChemSketch – chemical formula editor	5	
Microsoft Office: Word	5	
Microsoft Office: Excel	6	Teaching, examples, case studies, applications
Microsoft Office: Power Point	4	Teaching, examples, case studies, applications
Matlab: scalars, vectors, matrix; normal operations, solving linear equations systems	6	Teaching, examples, case studies, applications
Matlab: 2D and 3D graphics	5	Teaching, examples, case studies, applications
Logical control ("if", "if-else", "for", "while"). M-files function handling	5	Teaching, examples, case studies, applications

Bibliography ¹⁴

1. Bott E., Siechert C., Stinson C., Windows 7 inside out, Redmond: Microsoft Press, 2010.
2. ACD/ChemSketch 2018 1.1 reference manual, 2018.
2. Dumitru A., Bădescu D., Office 2013 (Chip Kompakt). Brașov: 3 D Media Communications, 2012.
3. Matthews C., Cronan M., Cronan J., Microsoft Office 2010 quicksteps (QuickSteps / series creators: Marty and Carole Matthews). New York: McGraw-Hill, 2010.
5. Todinca T., Geanta M., Modelarea si simularea proceselor chimice. Aplicații în MATLAB, Timișoara: Politehnica, 1999

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

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.

- The syllabus is developed according to the requirements in the chemical/biochemical engineering field, being similar to other disciplines from Romanian universities and abroad.
- The syllabus was written considering the requirements and expectations of the employers in the field. These aspects were identified during discussions between Chemical Engineering Board members; the economic environment is well represented with distinguished representatives on this Board.
- The competencies acquired will be of great use for employees working in chemical plants, but also in research and development facilities, including design of chemical equipment

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁵	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Basic principles learnt in course classes. Good application of theory into solving problems	Two tests during the first 14 weeks of didactic activity, consisting of multiple/single choice questions with theoretical and practical features	0.4
10.5 Applied activities	S:		
	L: - ability to use Microsoft Office applications: Word, Excel, Power Point, chemical formula editor, respectively; Ability to write a scientific report using scientific electronic resources Ability to solve simple chemical engineering problems using Matlab.	Answers to questions during applications classes, solving homework, given applications and tests	0.6
	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)			
<ul style="list-style-type: none"> • Basic knowledge of Microsoft Office use: Word, Excel, Power Point and ChemSketch necessary to write a chemistry report, experimental data handling using spreadsheet processing, presentation of the results, etc. • Development of an algorithm for a given problem and its Matlab implementation. 			

Date of completion

Course coordinator
(signature)

Coordinator of applied activities
(signature)

prof. dr. ing. Gabriela-Alina DUMITREL

S.I. dr. ing. Anamaria PANĂ

Head of Department
(signature)

Date of approval in the Faculty Council ¹⁸

Dean
(signature)

S.L.dr.ing. Andra TĂMAȘ

Ș.L.dr.ing. Mircea Laurențiu DAN

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.

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