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/Mechanics and Strength of Materials
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]			Elements of Mechanical Engineering / DD				
2.2 Coordinator (holder) of course activities			Prof. Dr. Habil. Eng. Emanoil LINUL				
2.3 Coordinator (holder) of applied activities[5]			Prof. Dr. Habil. Eng. Emanoil LINUL				
2.4 Year of study[6]	I	**2.5** Semester	2	**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	3 of which:	**3.2** course	2	**3.3** seminar / laboratory / project	1
3.1* Total number of fully assisted hours / semester	42 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	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	2,35 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0,35
		hours of individual study after manual, course support, bibliography and notes			1
		training seminars / laboratories, homework and papers, portfolios and essays			1
3.7* Number of hours of unassisted activities / semester	33 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			5
		hours of individual study after manual, course support, bibliography and notes			14
		training seminars / laboratories, homework and papers, portfolios and essays			14
3.8 Total hours / week [9]	5,35				
3.8* Total hours /semester	75				
3.9 Number of credits	3				

4. **Prerequisites** (where applicable)

4.1 Curriculum	• Mathematical Analysis, Physics, Algebra and Geometry, Computer-Aided Design

[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	• Identification, definition, use of notions from fundamental sciences specific to the chemical engineering field

5. Conditions (where applicable)

5.1 of the course	• Spacious lecture classroom with good lighting, video projector and appropriate blackboard. Telephone conversations, delays, discussions between students are prohibited. Owning of appropriate office equipment
5.2 to conduct practical activities	• Seminar room equipped with appropriate blackboard and furniture. Minicomputer is required and comments on the topic discussed are recommended

6. Specific competencies acquired through this discipline

Specific competencies	• To apply the fundamental knowledge of general and specialized technical culture to solve technical problems specific to the field • To acquire the methodology of mechanic's calculations for domain-specific problems • To choose the optimal methods of solving problems specific to the field • To develop and use schemes, structural and functional diagrams, graphic representations and technical documents specific to the field
Professional competencies ascribed to the specific competencies	• Analyze 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

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

7.1 The general objective of the discipline	• Learning the methodology of mechanic's calculations. This knowledge constitutes a basis for the understanding and approach of specific aspects taught in the courses of the senior years.
7.2 Specific objectives	• Familiarity with the types of simple loads encountered in engineering. • The acquisition by students of the necessary knowledge to carry out the calculation of strength and deformability of parts and structures in static mode. • Acquiring the mechanical behavior of strength elements/structures used in the field of engineering

8. Content [10]

8.1 Course	Number of hours	Teaching methods [11]
Rigid solid mechanics. General notions	4	Power Point presentation supported by detailed explanations on the
Mechanics of deformable solids. General notions	2	
Inner forces (efforts). Effort diagrams	2	
Stresses. Strains	2	

[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.).

Axial load (tensile-compression)	4	board. All introduced notions are deepened through calculation examples.
Geometric characteristics of flat surfaces	4	
Bending of straight bars	4	
Torsion of straight bars	4	
Calculation of parts joints	2	

Bibliography [12]

1. E. Linul, S. Galatanu, D. Silaghi-Perju, Fundamente de inginerie mecanica. Solicitari mecanice, Ed. Politehnica, 2019
2. D. Silaghi-Perju, E. Linul, Fundamente de inginerie mecanica. Teorie si aplicatii, Ed. Politehnica, Timisoara, 2013
3. R. Nagy, K. Menyhardt, Fundamente de inginerie mecanica si solicitari mecanice, Ed. Politehnica, 2019
4. G. Draganescu, Mecanica, Ed. Politehnica, Timisoara 2004
5. N. Faur, Mecanica Materialelor, Ed. Politehnica, Timisoara 2005

8.2 Applied activities [13]	Number of hours	Teaching methods
Equilibrium of the rigid solid	2	- theme exposure - problematization - case study - solving specific problems
Effort diagrams	2	
Axial load (tensile-compression)	2	
Geometric characteristics of flat surfaces	2	
Bending of straight bars	2	
Torsion of straight bars	2	
Calculation of parts joints	2	

Bibliography [14]

1. E. Linul, S. Galatanu, D. Silaghi-Perju, Fundamente de inginerie mecanica. Solicitari mecanice, Ed. Politehnica, 2019
2. D. Silaghi-Perju, E. Linul, Fundamente de inginerie mecanica. Teorie si aplicatii, Ed. Politehnica, Timisoara, 2013
3. R. Nagy, K. Menyhardt, Fundamente de inginerie mecanica si solicitari mecanice, Ed. Politehnica, 2019
4. G. Draganescu, Mecanica, Ed. Politehnica, Timisoara 2004
5. N. Faur, Mecanica Materialelor, Ed. Politehnica, Timisoara 2005

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 knowledge acquired within the discipline can be found in the current activity of engineers, and this is evidenced by all the employers with whom the Faculty/Department maintains collaborations.

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	-Knowledge of the terminology presented in the course -Learning the methodology of mechanics calculations	-Written exam (2 hours) with 2 internal examiners. -The exam subjects contain a theoretical part (1 Theory) and an applied part (3 Problems)	50%
10.5 Applied activities	**S:** Mastering the issues covered in the course and seminar	Answers to the seminar and solving 2 problems from the previously seminared chapters	50%
	L:		

[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.)

	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])

- The granting of credits related to the discipline is conditional on obtaining a minimum final grade of 5 (five).
- The final grade is made up of the exam grade (50%) and the course activity grade (50%).
- To pass the exam, three subjects must be passed (with a minimum grade of 5): Theory and 2 Problems. In addition, the average of the four grades (Theory, Problem 1, Problem 2 and Problem 3) must be greater than or equal to 5.
- To pass the seminar, one of the two tests (problems) must be passed, and the average between the two grades (tests) must be at least 5.
- The grade for the activity along the way ends with a passing grade only if the seminar is finished with a minimum grade of 5.
- The promotion of any part (theory or problem) is recognized until the end of the situation for the respective year

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
25.09.2024	Prof. Dr. Eng. Emanoil LINUL	Prof. Dr. Eng. Emanoil LINUL

Head of Department (signature)	**Date of approval in the Faculty Council** [18]	**Dean (signature)**
Conf.dr.ing. Dan Ioan STOIA		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.