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]			Strength of Materials / 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]	II	**2.5** Semester	3	**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	2 of which:	**3.2** course	1	**3.3** seminar / laboratory / project	0/1/0
3.1* Total number of fully assisted hours / semester	28 of which:	**3.2*** course	14	**3.3*** seminar / laboratory / project	0/14/0
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	1,57 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0,5
		hours of individual study after manual, course support, bibliography and notes			0,5
		training seminars / laboratories, homework and papers, portfolios and essays			0,57
3.7* Number of hours of unassisted activities / semester	22 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			7
		training seminars / laboratories, homework and papers, portfolios and essays			8
3.8 Total hours / week [9]	3,57				
3.8* Total hours /semester	50				
3.9 Number of credits	2				

4. **Prerequisites** (where applicable)

4.1 Curriculum	• Elements of Mechanical Engineering, 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 of strength of materials specific to the field • To acquire the methodology of strength of materials 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 strength of materials 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 combined 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 and dynamic 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]
Combined loads	6	Power Point presentation supported by detailed
Energy methods. Statically indeterminate systems	4	
Buckling of straight bars	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.).

Dynamic loads	2	explanations on the board. All introduced notions are deepened through calculation examples.

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. P. Tripa, M. Hluscu, Rezistenţa materialelor. Noţiuni fundamentale şi aplicaţii, Editura Mirton, Timişoara, 2006
4. M. Hluscu, P. Tripa, Rezistenţa materialelor II, Editura Mirton, Timişoara, 2006
5. N. Faur, Mecanica Materialelor, Ed. Politehnica, Timisoara 2013

8.2 Applied activities [13]	Number of hours	Teaching methods
Fundamental principles of occupational health and safety, Presentation of the laboratory, Introduction to the problems of the laboratory	2	-laboratory description -case study -experimental tests -data processing -interpretation of the results -final conclusions
Tensile testing of general purpose steel. Compression testing of steel and cast iron	2	
Analysis of the strain state in a bar subjected to eccentric tension using electrical resistive tensometry	2	
Experimental determination of the critical buckling force	2	
Experimental determination of strains in oblique bending	2	
Resilience test: Determination of fracture energy	2	
Restoring laboratory work and concluding the activity	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. P. Tripa, M. Hluscu, Rezistenţa materialelor. Noţiuni fundamentale şi aplicaţii, Editura Mirton, Timişoara, 2006
4. E. Linul, D.A. Serban si colab., Rezistenţa materialelor. Lucrari de laborator, Ed. Politehnica, 2019

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 strength of materials calculations	-Written exam (2 hours) with 2 internal examiners. -The exam subjects contain a theoretical part (1 Theory) and an applied part (2 Problems)	50%

[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.)

10.5 Applied activities	**S:**		
	L: -Mastering the issues covered in the course -Knowledge of the content and conduct of the laboratory work	Written test to verify the content and the way of carrying out the laboratory work	50%
	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, two subjects must be passed (with a minimum grade of 5): Theory and 1 Problem. In addition, the average of the three grades (Theory, Problem 1 and Problem 2) must be greater than or equal to 5. • To pass the laboratory, the test/tests must be passed with a minimum grade of 5. • The grade for the activity along the way ends with a passing grade only if the laboratory is finished with a minimum grade of 5. The laboratory grades are recognized until the end of the situation for the respective year. • 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.