SYLLABUS [1]

1. Information about the program

1.1 Higher education institution	POLYTECHNICA UNIVERSITY TIMISOARA
1.2 Faculty[2]/ Department [3]	CIVIL ENGINEERING / CMMC
1.3 Chair	—
1.4 Field of study (name/code[4])	Civil engineering/80
1.5 Study cycle	bachelor
1.6 Study program (name/code/qualification)	Civil engineering in English/10/Engineer

2. Information about the discipline

2.1 Name of discipline/ formative category[5]	Mechanics of Materials 2 / DD						
2.2 Coordinator (holder) of course activities	S.l.dr.ing. Mirela Achim						
2.3 Coordinator (holder) of applied activities[6]	S.l.dr.ing. Mirela Achim						
2.4 Year of study[7]	2	**2.5** Semester	4	**2.6** Type of evaluation	E	**2.7** Type of discipline[8]	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [9]

3.1 Number of fully assisted hours / week	5 of which:	**3.2** course	2	**3.3** seminar / laboratory / project	3
3.1* Total number of fully assisted hours / semester	70 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	42
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	2.5 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			1
		training seminars / laboratories, homework and papers, portfolios and essays			1.5
3.7* Number of hours of unassisted activities / semester	35 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			14
		training seminars / laboratories, homework and papers, portfolios and essays			21
3.8 Total hours / week [10]	7.5				
3.8* Total hours /semester	105				
3.9 Number of credits	5				

[1] The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.
[2] The name of the faculty which manages the educational curriculum to which the discipline belongs
[3] The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.
[4] The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.
[5] 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).
[6] Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[7] Year of studies in which the discipline is provided in the curriculum.
[8] Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).
[9] 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.
[10] 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. Prerequisites (where applicable)

4.1 Curriculum	• Mathematical Analysis, Algebra and Geometry, Physics, Mechanics, Mechanics of Materials I
4.2 Competencies	• Operate with the scientific, engineering and fundamentals of computer science

5. Conditions (where applicable)

5.1 of the course	• Support materials: laptop, projector, projection screen, whiteboard
5.2 to conduct practical activities	• Support materials: laptop, projector, projection screen, whiteboard

6. Specific competencies acquired through this discipline

Specific competencies	• Understand and apply in practice all the tools necessary to analyze bar elements subjected to compound actions
Professional competencies ascribed to the specific competencies	• Recognizing typical structures and structural elements, specific to the graduated study programme • Design of structural elements in civil engineering, specific to graduated study programme
Transversal competencies ascribed to the specific competencies	• Documentation in Romanian and foreign language, in view of professional and personal development, via continuous learning and efficient adaptation to the new technical specifications

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

7.1 The general objective of the discipline	The discipline objective is to obtain knowledge of theoretical fundamentals and practical design methods, in order to determine the state of stresses and strains in structural elements used in civil engineering •
7.2 Specific objectives	The specific objectives are to understand and apply in practice all the tools necessary to analyze, from strength and rigidity point of view, bar elements (beams, columns) subjected to compound actions, in the elastic and plastic behaviour •

8. Content [11]

8.1 Course	Number of hours	Teaching methods [12]
1. Biaxial Bending with Shearing	5	Lecture, conversations, explanations, examples
2 Eccentric Tension and Compression	7	
3. Energy Methods; Mohr-Maxwell's energetically formula for Displacements	4	
4. Pure (uniform) Torsion; Non-uniform (prevented) Torsion	7	
5. State of Stresses in 2D and3D; State of Strain in 2D and 3D	2	
6. Buckling of axially compressed bars	3	

Bibliography [13]

1. TIMOSHENKO, S., GOODIER, J.N.: Theory of Elasticity, McGraw-Hill Company, New York, 1951

2. ACHIM, M.: Lessons of Mechanics of Materials: Theory & Applications, Part I, Ed. Orizonturi Universitare, Timisoara, 2015

3. ACHIM, M.: Lessons of Mechanics of Materials: Theory & Applications, Part II, Ed. Orizonturi Universitare, Timisoara, 2015

4. ACHIM, M.: Rezistenta materialelor , UPT, Timisoara, 1996

5. PANTEL, M., IOANI, A., TURDA, D.: Lessons of Strength of Materials , Napoca Star, Cluj Napoca, 2004

8.2 Applied activities [14]	Number of hours	Teaching methods
1. Seminar - Biaxial Bending with Shearing	5	Exposure theme, discussion, questions, problem solving
2. Seminar - Eccentric Tension and Compression	7	
3. Project - Biaxial Bending with Shearing & Eccentric Tension and Compression	8	
4. Seminar - Mohr-Maxwell's energetically formula for Displacements	6	
5. Project - Mohr-Maxwell's energetically formula for Displacements	2	Problems solving
6. Seminar - Pure Torsion; Prevented Torsion	6	Exposure theme, discussion, questions, problem solving
7. Project - Pure Torsion; Prevented Torsion	4	Problems solving
8. Seminar - Plane State of Stress	2	Exposure theme, discussion, questions,

[11] 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 "(*)".
[12] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).
[13] 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.
[14] 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".

		problem solving
9. Buckling of axially compressed bars	2	Exposure theme, discussion, questions, problem solving

Bibliography [15]

1. TIMOSHENKO, S., GOODIER, J.N.: Theory of Elasticity, McGraw-Hill Company, New York, 1951

2. ACHIM, M.: Lessons of Mechanics of Materials: Theory & Applications, Part I, Ed. Orizonturi Universitare, Timisoara, 2015

3. ACHIM, M.: Lessons of Mechanics of Materials: Theory & Applications, Part II, Ed. Orizonturi Universitare, Timisoara, 2015

4. ACHIM, M.: Rezistenta materialelor , UPT, Timisoara, 1996

5. PANTEL, M., IOANI, A., TURDA, D.: Lessons of Strength of Materials , Napoca Star, Cluj Napoca, 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

- Assessment of students knowledge in the field of Mechanics of Materials

10. Evaluation

Type of activity	**10.1** Evaluation criteria [16]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	The answer to the course topics and applications	Written exam	60%
10.5 Applied activities	**S:** Solving the problems relating to the seminar, during the semester	Written tests	20%
	L: Solving the problems relating to the project, during the semester	Written tests	10%
	P[17]**:**		
	Pr: Presence		10%
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [18])			
• The answers to the exam topics must have a minimum score of 4.5 points out of 9 possible			

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
22.01.2018		
Head of Department	……..…… **Date of approval in the Faculty**	…….. **Dean**

[15] At least one title must belong to the discipline team.
[16] 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.)
[17] 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.
[18] It will not explain how the promotion mark is awarded.

(signature)	Council [19]	(signature)
	12.02.2018	
……		……

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