SYLLABUS [1]

THIS COURSE UNIT IS TAUGHT IN ROMANIAN LANGUAGE

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[2]/ Department [3]	Mechanical Engineering/IMF
1.3 Chair	—
1.4 Field of study (name/code[4])	ENGINEERING SCIENCES / 20
1.5 Study cycle	Bachelor
1.6 Study program (name/code/qualification)	ROAD VEHICLE / 20 / ENGINEER

2. Information about the discipline

2.1 Name of discipline/ formative category[5]	Special materials for vehicles / DS						
2.2 Coordinator (holder) of course activities	Assoc.Prof. Dr.Eng. CDREAN Cosmin						
2.3 Coordinator (holder) of applied activities[6]	Assoc.Prof. Dr.Eng. CDREAN Cosmin						
2.4 Year of study[7]	4	**2.5** Semester	7	**2.6** Type of evaluation	D	**2.7** Type of discipline[8]	DO

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	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	3 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			1
		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	42 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			14
		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 [10]	6				
3.8* Total hours /semester	84				
3.9 Number of credits	3				

4. Prerequisites (where applicable)

4.1 Curriculum	• Materials science

[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.

4.2 Competencies	• Operating with fundamental concepts in the field of engineering sciences

5. Conditions (where applicable)

5.1 of the course	• Lecture room equipped with whiteboard, projector and projection screen
5.2 to conduct practical activities	• Laboratory of developing amorphous alloys; laboratory for characterization of amorphous alloys

6. Specific competencies acquired through this discipline

Specific competencies	• Acquiring and applying knowledge on the composition, structure and processing of materials for the construction of road vehicles to obtain the desired operating characteristics
Professional competencies ascribed to the specific competencies	• • Appropriate use of fundamental concepts in the field of automotive engineering • • Designing constructive solutions to ensure the fulfillment of the functional requirements of vehicles
Transversal competencies ascribed to the specific competencies	•

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

7.1 The general objective of the discipline	• The course and laboratory aim to acquire knowledge on the characteristics of special materials for vehicles and the correlation chemical composition - structure - properties for this category of materials, so as to provide the graduate with skills to solve specific tasks such as production, processing and characterization of these materials.
7.2 Specific objectives	• Knowledge of some classes of conventional and advanced materials for the construction of motor vehicles and of some methods of their processing, in order to ensure the graduate competencies regarding the design of constructive solutions to ensure the fulfillment of the functional requirements of motor vehicles

8. Content [11]

8.1 Course	Number of hours	Teaching methods [12]
1. Steels used in the construction of road vehicles (families, properties, heat treatments, uses)	4	The teaching methods used are: lecture, demonstration, presentation slides, open discussion
2. Gray cast iron used in the construction of road vehicles (families, properties, heat treatments, uses)	2	
3. Non-ferrous alloys for road vehicles (aluminum alloys, copper alloys, magnesium alloys, tin alloys, metal foams, shape memory alloys)	10	

[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.).

4. Plastics for motor vehicles (classification, processing methods, uses)	4	
5. Composite materials in motor vehicle construction (classification, processing methods, uses)	8	

Bibliography [13] 1. Codrean, C., Uțu, D., Buzdugan, D., Șerban, V.A., Materiale metalice avansate – Aplicații practice, Ed. Politehnica, Timișoara, 2016
2. Şerban, V.A, Răduţă, A., Ştiinţa şi ingineria materialelor, Ed. Politehnica, Timişoara, 2014.
3. Mitelea I. E. Lugscheider W. Tillmann, Ştiinţa Materialelor în construcţia de maşini I, Ed. Sudura, Timişoara, 1999

8.2 Applied activities [14]	Number of hours	Teaching methods
1. Specific structures of alloyed and carbon steels used in the construction of motor vehicles	2	The teaching methods used are: lecture, demonstration, presentation slides, demonstration experiment, open discussion
2. Structure and properties of gray cast iron used in the construction of motor vehicles	2	
3. Structures specific to non-ferrous alloys used in the construction of motor vehicles	4	
4. Heat treatments applied to ferrous and non-ferrous alloys used in the construction of vehicles	4	
5. Structure and properties of composite materials.	2	

Bibliography [15] 1. Codrean, C., Uțu, D., Buzdugan, D., Șerban, V.A., Materiale metalice avansate – Aplicații practice, Ed. Politehnica, Timișoara, 2016
2. Şerban, V.A, Răduţă, A., Ştiinţa şi ingineria materialelor, Ed. Politehnica, Timişoara, 2014.
3. Şerban, V.A, Răduţă, Codrean, C.,Uţu D., Opriş C. Materiale şi tehnologii primare în experimente, Ed. Politehnica, Timişoara, 2013

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 course ensures the understanding of the concepts of structure, structural transformations and property theory so as to allow the graduate to design constructive solutions to ensure the fulfillment of the functional requirements of vehicles.

10. Evaluation

Type of activity	**10.1** Evaluation criteria [16]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Note 5 is granted for 50% knowledge of each subject and grade 10 for 100% knowledge of each subject	Written exam	66%
10.5 Applied activities	**S:** Note 5 is granted for the correct answer to 50% of questions and 10 for the	Periodically testing by means of questionnaires	34%

[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".
[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.)

	correct answer to all questions		
	L:		
	P[17]**:**		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [18])			
• Passing the exam requires a minimum amount of knowledge of 50% of the total volume of knowledge			

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
25.11.2020	……	……
Head of Department (signature)	**Date of approval in the Faculty Council** [19]	**Dean (signature)**
……		……

[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.

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