

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 / Materials and Manufacturing Engineering
1.3 Chair	—
1.4 Field of study (name/code ⁴)	Industrial Engineering / 130
1.5 Study cycle	Bachelor's degree
1.6 Study program (name/code/qualification)	Manufacturing engineering / 10

2. Information about the discipline

2.1 Name of discipline/ formative category ⁵	Thermal covering and reconditioning						
2.2 Coordinator (holder) of course activities	Aurelian Magda						
2.3 Coordinator (holder) of applied activities ⁶	Aurelian Magda						
2.4 Year of study ⁷	3	2.5 Semester	6	2.6 Type of evaluation	E	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	4 of which:	3.2 course	2	3.3 seminar / laboratory / project	2
3.1* Total number of fully assisted hours / semester	56 of which:	3.2* course	28	3.3* seminar / laboratory / project	28
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	4 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			2
		training seminars / laboratories, homework and papers, portfolios and essays			1
3.7* Number of hours of unassisted activities / semester	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			
		training seminars / laboratories, homework and papers, portfolios and essays			
3.8 Total hours / week ¹⁰	8				
3.8* Total hours /semester	112				
3.9 Number of credits	5				

4. Prerequisites (where applicable)

4.1 Curriculum	•
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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	•
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5. Conditions (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	•

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> Use of basic knowledge in fundamental disciplines to explain theoretical results, theorems, phenomena or processes specific to industrial engineering
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Use of basic knowledge to explain and interpret different types of technological manufacturing processes specific to the specialization degree
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> Applying the values and ethics of the engineering profession, and responsible execution of professional tasks in conditions of limited autonomy and qualified assistance. Promoting logical, convergent and divergent reasoning, practical applicability, evaluation and self-evaluation in decision making

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"> Fundamental principles of the application of reconditioning techniques for components that need to be redesigned and analysis of possibilities to apply coating techniques
7.2 Specific objectives	<ul style="list-style-type: none"> Presentation of friction phenomena and types of wear, thermal coatings of different types, establishing the principles of reconditioning for used components and designing a reconditioning technology, reconditioning processes by welding and related, principles and application

8. Content ¹¹

8.1 Course	Number of hours	Teaching methods ¹²
General considerations of surface degradation mechanisms - general processes of friction and wear	8	Electronic resources
Welding surfacing: cladding, hard facing, build-up	10	
Special coatings: plating, thermal spray coatings, hard coatings, galvanized coatings	6	
Organizing the reconditioning activity	2	
Estimating the economic efficiency of the coating and reconditioning processes	2	

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.).

Bibliography ¹³ 1. Popescu Mihaela, Aurelian Magda: Acoperiri termice si reconditionari, Ed. POLITEHNICA, Timisoara, 2007, ISBN 978-973-625-545-8		
2. Popescu Mihaela: Bazele Proceselor de Sudare, Ed. POLITEHNICA Timisoara, 2010, ISBN 978-606-554-242-6		
3. Popescu Mihaela, Aurelian Magda: Acoperiri termice si reconditionari, Ed. Politehnica Timisoara, 2008 ISBN 978-973-625-623-3		
8.2 Applied activities ¹⁴	Number of hours	Teaching methods
Wear processes of metal surfaces	2	Electronic resources
Determining the wear behavior of metallic materials	2	
Corrosion of metal surfaces	2	
Welding surfacing	6	
Iron – cast and aluminum reconditioning	6	
Schaeffler diagram	2	
Thermal spraying	4	
Coating and galvanized steel welding	4	
Bibliography ¹⁵ 1. Popescu Mihaela, Aurelian Magda: Acoperiri termice si reconditionari – teme experimentale, Ed. Politehnica, 2008 ISBN 978-973-625-623-3		

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

- Solving the problems of welding and mechanical assembly processes specific to industrial engineering

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁶	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Answer to each of the requested points	Final exam	60%
10.5 Applied activities	S:		
	L: Laboratory preparation, interactive participation	Testing during the semester	40%
	P¹⁷:		
	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)			
<ul style="list-style-type: none"> • Minimum amount of knowledge necessary: participation in all laboratory work, promotion of evaluation tests 			

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.)

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.

Date of completion

09.12.2020

**Head of Department
(signature)**

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**Course coordinator
(signature)**

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**Date of approval in the Faculty
Council ¹⁹**

**Coordinator of applied activities
(signature)**

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**Dean
(signature)**

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