

# SYLLABUS<sup>1</sup>

## 1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty <sup>2</sup> / Department <sup>3</sup>	Mechanical engineering / Materials and Manufacturing Engineering
1.3 Chair	—
1.4 Field of study (name/code <sup>4</sup> )	Industrial Engineering/130
1.5 Study cycle	master
1.6 Study program (name/code/qualification)	Productive welding processes in protective gas

## 2. Information about the discipline

2.1 Name of discipline	Welding behavior of advanced materials						
2.2 Coordinator (holder) of course activities	S.I.dr.eng. Aurelian Magda						
2.3 Coordinator (holder) of applied activities <sup>5</sup>	S.I.dr.eng. Aurelian Magda						
2.4 Year of study <sup>6</sup>	2	2.5 Semester	3	2.6 Type of evaluation	E	2.7 Type of discipline	DCA

## 3. Total estimated time (hours / semester of didactic activities)

3.1 No. of hrs. / week	4 , of which:	3.2 course	2	3.3 seminar/laboratory/ project/training	2
3.4 Total no. of hrs. in the education curricula	56 , of which:	3.5 course	28	3.6 applied activities	28
3.7 Distribution of time for individual activities related to the discipline					hrs.
Study using a manual, course materials, bibliography and lecture notes					18
Additional documentation in the library, on specialized electronic platforms and on the field					8
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					25
Tutoring					
Examinations					5
Other activities					
<b>Total hrs. of individual activities</b>					
3.8 Total hrs. / semester <sup>7</sup>	112				
3.9 No. of credits	9				

## 4. Prerequisites (where applicable)

4.1 Curriculum	•
4.2 Competencies	•

## 5. Conditions (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	•

## 6. Specific competencies acquired

<sup>1</sup> The form corresponds to the Syllabus promoted by OMECTS 5703/18.12.2011 (Annex3).

<sup>2</sup> The name of the faculty which manages the educational curriculum to which the discipline belongs.

<sup>3</sup> The name of the department entrusted with the discipline, and to which the course coordinator / holder belongs.

<sup>4</sup> Fill in the code provided in GD no. 493/17.07.2013.

<sup>5</sup> The applied activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

<sup>6</sup> The year of study to which the discipline is provided in the curriculum.

<sup>7</sup> It is obtained by summing up the number of hrs. from 3.4 and 3.7.

Professional competencies <sup>8</sup>	<ul style="list-style-type: none"> <li>• Capacity development, implementation and control technologies for high productivity welding.</li> <li>• Design capacity of welded joints and control of advanced materials</li> </ul>
Transversal competencies	<ul style="list-style-type: none"> <li>• Capacities of scientific research.</li> </ul>

### 7. Objectives of the discipline (based on the grid of specific competencies acquired)

7.1 General objective of the discipline	<ul style="list-style-type: none"> <li>• Study of advanced materials (plastics, ceramics, composites, shape-memory alloys) and the techniques of their joining,</li> </ul>
7.2 Specific objectives	<ul style="list-style-type: none"> <li>• Identify components of traditional materials that can be replaced with these materials.</li> </ul>

### 8. Content

8.1 Course	No. of hours	Teaching methods
Joint technology plastics materials: general classification and grading plastics materials, plastics joining process.	10	Power point presentation
Ceramics Welding Technology: general, ceramic materials classification, ceramics joints process:	6	Power point presentation
Joint technology of composite materials: general classification of composite materials, MCM and MCT joining process	8	Power point presentation
Joint shape memory alloys technology: general aspects, classification, joining technologies	4	Power point presentation

Bibliography<sup>9</sup>

1. DRĂGULESCU, D. și POPESCU, M.: Enciclopedia materialelor compozite, Ed. Politehnica Timișoara, 2006
2. DRĂGULESCU, D. și POPESCU, M.: Materiale compozite metalice; prezent cu perspective, Ed. ORIZONTURI UNIVERSITARE TIMIȘOARA, 1999
3. POPESCU, M.: Imbinarea materialelor avansate. Materiale compozite, Ed. Eurostampa, Timisoara, 2002;
4. POPESCU, M.: Imbinarea materialelor avansate. Materiale ceramice, Ed. Eurostampa, Timisoara, 2002;
5. POPESCU, M; MILOS, L., MARTA, C.: Imbinarea materialelor avansate. Aliaje cu memoria formei, Ed. Eurostampa, Timisoara, 2002;
6. POPESCU, M.: Tehnici de imbinarea materialelor plastice, Ed. Politehnicii, Timisoara, 2004;
7. XXX: Welding Handbook, Plastics, Ceramics, Composites, 1998

<sup>8</sup> The professional competencies and the transversal competencies will be treated according to the Methodology of OMECTS 5703/18.12.2011. The competencies listed in the National Register of Qualifications in Higher Education [Registrul Național al Calificărilor din Învățământul Superior RNCIS] ([http://www.rncis.ro/portal/page?\\_pageid=117,70218&\\_dad=portal&\\_schema=PORTAL](http://www.rncis.ro/portal/page?_pageid=117,70218&_dad=portal&_schema=PORTAL)) will be used for the field of study from 1.4 and the program of study from 1.6 of this form, involving the discipline.

<sup>9</sup> At least one title must belong to the department staff teaching the discipline, and at least 3 titles must refer to national and international works relevant for the discipline, and which can be found in the Politehnica University Library.

8.2 Applied activities <sup>10</sup>	No. of hours	Teaching methods
Plastics. Types, properties, processing methods	2	direct and interactive teaching
Methods of joining plastic materials	6	direct and interactive teaching
PEHD pipe welding	6	direct and interactive teaching
Ceramics joining methods	4	direct and interactive teaching
Composites materials welding (ultrasound and resistance welding)	6	direct and interactive teaching
Shape memory alloy joining	4	direct and interactive teaching
Bibliography <sup>11</sup> 1. POPESCU, M.: Imbinarea materialelor avansate. Materiale compozite, Ed. Eurostampa, Timisoara, 2002; 2. POPESCU, M.: Imbinarea materialelor avansate. Materiale ceramice, Ed. Eurostampa, Timisoara, 2002; 3. POPESCU, M; MILOS, L., MARTA, C.: Imbinarea materialelor avansate. Aliaje cu memoria formei, Ed. Eurostampa, Timisoara, 2002; 4. POPESCU, M.: Tehnici de imbinarea materialelor plastice, Ed. Politehnicii, Timisoara, 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**

<ul style="list-style-type: none"> <li>Alignment with the International of Welding Federation requirements specified in its guidelines</li> </ul>
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**10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Responses of the items requested	written examination	65%
10.5 Applied activities	<b>S:</b>		
	<b>L:</b> test grades and interactive participation of the activities	Tests during the semester	35%
	<b>P:</b>		
	<b>Pr:</b>		
<b>10.6 Minimum performance standard</b> (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
<ul style="list-style-type: none"> <li>Participation of all laboratory works, promotion tests during the semester and final exam</li> <li>Types of advanced materials knowledge and methods of their joining</li> </ul>			

<sup>10</sup> The types of applied activities are those specified in footnote 5. If the discipline contains several types of applied activities, then these will be written consecutively in the lines of the table below. The type of activity will be written in a distinct line, as „Seminar:”, „Laboratory:”, „Project:” and/or „Practice/Training:”.

<sup>11</sup> At least one title must belong to the staff teaching the discipline.

**Date of completion**

10.12.2015

**Course coordinator  
(signature)**

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**Coordinator of applied activities  
(signature)**

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**Head of Department  
(signature)**

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**Date of approval in the Faculty  
Council<sup>12</sup>**

**Dean  
(signature)**

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<sup>12</sup> Avizarea este precedată de discutarea punctului de vedere al board-ului de care aparține programul de studiu cu privire la fișa disciplinei.