

SYLLABUS¹

1. Information about the program

1.1 Higher education institution	Politehnica University of Timișoara
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/10
1.5 Study cycle	Master
1.6 Study program (name/code/qualification)	Integrated Engineering

2. Information about the discipline

2.1 Name of discipline	Total Productive Maintenance						
2.2 Coordinator (holder) of course activities	Assoc. Prof. PhD Eng. Eugen PĂMÎNȚAȘ						
2.3 Coordinator (holder) of applied activities ⁵	Lect. Ph D. Eng. Felicia-Veronica BANCIU						
2.4 Year of study ⁶	I	2.5 Semester	2	2.6 Type of evaluation	E	2.7 Type of discipline	DA/ Compulsory

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

3.1 No. of hrs. / week	3 , of which:	3.2 course	1.5	3.3 seminar/laboratory/ project/training	1.5
3.4 Total no. of hrs. in the education curricula	42 , of which:	3.5 course	21	3.6 applied activities	21
3.7 Distribution of time for individual activities related to the discipline					hrs.
Study using a manual, course materials, bibliography and lecture notes					42
Additional documentation in the library, on specialized electronic platforms and on the field					10
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					42
Tutoring					14
Examinations					1
Other activities					3
Total hrs. of individual activities					112
3.8 Total hrs. / semester ⁷	154				
3.9 No. of credits	6				

4. Prerequisites (where applicable)

4.1 Curriculum	<ul style="list-style-type: none"> Fundamentals of technological equipment maintenance and reliability
4.2 Competencies	<ul style="list-style-type: none"> Using the engineering knowledge to improve or modifying equipment to prevent breakdowns, increasing reliability or to make maintenance easier.

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> Classroom, video equipment, PC or Laptop and board
5.2 to conduct practical activities	<ul style="list-style-type: none"> Classroom laboratory with specific equipment and software for maintenance activities

6. Specific competencies acquired

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

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 Fill in the code provided in GD no. 493/17.07.2013.

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

⁶ The year of study to which the discipline is provided in the curriculum.

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

Professional competencies ⁸	<ul style="list-style-type: none"> • Selecting, combining and developing methods of increasing operational and technological equipment maintainability • Definition and comprehensive description of the concepts, methods and advanced monitoring equipment exploitation, management and maintenance of production systems during the entire their life cycle. • Using assisted methods and models for diagnosis and decision making in the problems of design, management and monitoring of technological equipment exploitation.
Transversal competencies	<ul style="list-style-type: none"> • Developing the capacity and ability to implement methods to improve product quality and manufacturing processes, ensuring maintenance and reliability • Developing the capacity for planning, management and optimized process management and production systems

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"> • Understand the basic concept and philosophy of Total Productive Maintenance (TPM) as a foundation for Lean Manufacturing
7.2 Specific objectives	<ul style="list-style-type: none"> • Learn the 8 pillars and the tools of TPM activities, • TPM implementation strategy • The roadmap to kick-start TPM deployment with Autonomous Maintenance • Planned Maintenance, • Focused Improvement, • Education& Training activities to improve equipment reliability.

8. Content

8.1 Course	No. of hours	Teaching methods
New concepts of organization of maintenance activities	1	exposure, explanation
The concept of Total Productive Maintenanc	1	Exposure and argumentation
TPM principles	2	argumentation
Eight major Pillars of TPM	3	presentation
Benefits of 5S	3	demonstration and exemplification
TPM tools	2	good practice examples
Autonomus maintenance	2	exposure
Integration of AM with Planned maintenance & Education and training	2	drawings
TPM in the Office	1	Case study and good practice exemples
Quality maintenance	1	presentation
Leadership skills to implement total productive maintenance	1	argumentation, debate
Modern methods of maintenance activities management	1	overview
Elements for the economic efficiency analysis of MTP approach	1	calculation

⁸ 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) 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.

Bibliography⁹

1. Kister, C.T., Hawkins, B. – *Maintenance Planing and Scheduling*, Elsevier Inc., 2006, ISBN: 978-7506-7832-2;
2. Nakajima, S. – *La maintenance Productive Totale-Mise en oeuvre*, AFNOR, Paris, 1989.
3. Pămîntaş, E. *Mentenanța total productivă*, Suport de curs, http://www.eng.upt.ro/personal/pamintas/cursuri_2013_11_15.rar
4. Urda, I., *Avariile in industrie, Managementul starii de avarie*, Editura AGIR, Bucuresti, 2006, ISBN 973-720-081-0.

8.2 Applied activities¹⁰

	No. of hours	Teaching methods
- Designing a Total Productive Maintenance program for product / process - individual topic; - Maintenance report writing; - Specific elements to ensure safety repairs and user training and service personnel - Technical report explaining and justifying, drawings, product / process sequence diagram of maintenance events, binary decision diagrams, tables, reliability calculations and economic indicators.	21	drawings, calculation, demonstration, argumentation, debate, exposure

Bibliography¹¹

1. Kister, C.T., Hawkins, B. – *Maintenance Planing and Scheduling*, Elsevier Inc., 2006, ISBN: 978-7506-7832-2;
2. Nakajima, S. – *La maintenance Productive Totale-Mise en oeuvre*, AFNOR, Paris, 1989.
3. Pămîntaş, E. *Mentenanța total productivă*, Suport de curs, http://www.eng.upt.ro/personal/pamintas/cursuri_2013_11_15.rar
4. Urda, I., *Avariile in industrie, Managementul starii de avarie*, Editura AGIR, Bucuresti, 2006, ISBN 973-720-081-0.

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

- Strengthening knowledge of engineering which covers matters relating to the maintenance and reliability of machine tool components of processing systems, focusing on the practical requirements of companies with activities on the manufacture of mechanical parts;
- Development of cognitive skills: theories&new concepts in maintenance, specific engineering tools applied in maintenance;
- Development of functional skills: organization, planning and management of the Maintenance Department in a company

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	-the knowledge of specific skills; - fundamental understanding of phenomena generating malfunctions, - practical skill application in specific TPM techniques, - overall efficiency calculation.	Written + oral exam before two internal examiners during the max. 30 '+ 20' on 2 subjects (theory + app) grouped in 10 distinct exam tickets.	2/3
10.5 Applied activities	S:		

⁹ 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.

¹⁰ 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:”.

¹¹ At least one title must belong to the staff teaching the discipline.

	L:		
	P: Summative assessment – portfolio or project presentation at the semester end	It notes at the end of each stage along the way, the average grade is 70% of the final mark, plus the mark obtained in supporting the project to the group (30%). The final grade is given for getting five from each of the two components of the score corresponding to ½. Final Grade 5 is awarded for each subject exam obtain a ½ points based on documentation and promotion of the project with a share of 33% of the final grade.	1/3
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
<ul style="list-style-type: none"> • TPM principles, • Benefits of 5S, TPM tools, • Elements for the economic efficiency analysis of MTP approach, • Practical skill in application of specific TPM techniques 			

Date of completion

12.12.2015

**Course coordinator
(signature)**

.....

**Coordinator of applied activities
(signature)**

.....

**Head of Department
(signature)**

.....

**Date of approval in the Faculty
Council¹²**

.....

**Dean
(signature)**

.....

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