

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	Advanced machines tools						
2.2 Coordinator (holder) of course activities	Ph.D. Adrian BUT						
2.3 Coordinator (holder) of applied activities ⁵	Ph.D. Adrian BUT						
2.4 Year of study ⁶	I	2.5 Semester	1	2.6 Type of evaluation	E	2.7 Type of discipline	DA/ Optional

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					28
Additional documentation in the library, on specialized electronic platforms and on the field					28
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					28
Tutoring					2
Examinations					4
Other activities					11
Total hrs. of individual activities					149
3.8 Total hrs. / semester ⁷	205				
3.9 No. of credits	8				

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	• on the work shop with CNC lathe machine tool and vertical milling center and on CAD/CAM Laboratory with 15 work stations.

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"> • learn about CNC machine tools controlled by computer, • learn to operate and program this complex machine tools, • learn how to implement the CAM applications and optimized the manufacturing applications
Transversal competencies	<ul style="list-style-type: none"> •

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"> • The particularities of the CNC machine tools, the modality how to operate and program the CNC lathes and vertical milling centers
7.2 Specific objectives	<ul style="list-style-type: none"> • learn about CNC machine tools controlled by computer, how to operate and program this complex machine tools, implement the CAM applications and optimized the manufacturing applications. OPERATE AND PROGRAMMING CNC MACHINE TOOLS

8. Content

8.1 Course	No. of hours	Teaching methods
Definition of machine tool with numerical control. Evolution of the numerical control. Classification of the NC equipments.	2	
The influence of CNC equipments on the machine tool structure. Origins and coordinate systems of the CNC machine-tools	4	
G,M Codes.	4	
Steps in the NC manual programming. Programming language of CNC control.	2	
Lathe programming cycles.	2	
Milling programming cycles. Milling strategies.	4	
CNC lathe programming examples, CNC milling programming examples	4	
Computer aided manufacturing(CAM) applications	6	

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.

Bibliography ⁹ 1. Peter J. Hoffman, Eric S. Hopewell, s.a- Precision Machining Technology - Editura DELMAR CRENGAGE Learning -USA-2009. 4. Heinz Tschätsch- Applied Machining Technology - SPRINGER Dordrecht Heidelberg London New York-2009.		
8.2 Applied activities¹⁰	No. of hours	Teaching methods
CNC machine tools construction structures particularities	2	
SL-10 CNC lathe machine tool -construction, functionality particularities	2	
Construction, functionality particularities of the CNC vertical milling center machine tools.	2	
Computer aided manufacturing steps for CNC lathe programming.	4	
Computer aided manufacturing steps for CNC milling programming.	4	
CAM applications on CNC lathe machine tools.	4	
Computer aided manufacturing applications on CNC milling machine tools.	6	
Bibliography ¹¹ 1. Peter J. Hoffman, Eric S. Hopewell, s.a- Precision Machining Technology - Editura DELMAR CRENGAGE Learning -USA-2009. 2. Heinz Tschätsch- Applied Machining Technology - SPRINGER Dordrecht Heidelberg London New York-2009.		

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

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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	Test assisted by computer	Theoretical evaluation will consist by one certification obtained in a test evaluation assisted by computer. Minimum percentage being 50%.	40%

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.

10.5 Applied activities	S: Applied activities evaluation will be to develop a computer aided manufacturing application on the CNC lathe, or on CNC vertical milling center.	CAM - applications : 1. import the CAD in to the CAM 2. Establish the raw part dimension and the material 3. fixture 4. Cutting tools and the cutting tools parameters 5. Elaborate the NC program 5. Simulation 6. Data transfer 7. Manufacturing the part on the CNC machine tool.	60%
	L:		
	P:		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
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Date of completion

12.12.2015

**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
Council¹²**

**Dean
(signature)**

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