

SYLLABUS ¹

THIS COURSE UNIT IS TAUGHT IN ROMANIAN LANGUAGE

1. Information about the program

1.1 Higher education institution	Politehica University of Timisoara
1.2 Faculty ² / Department ³	Faculty for Mechanical Engineering/Department of Mechatronics
1.3 Chair	—
1.4 Field of study (name/code ⁴)	
1.5 Study cycle	licence
1.6 Study program (name/code/qualification)	

2. Information about the discipline

2.1 Name of discipline/ formative category ⁵	Basics for Mechatronic Systems/DF						
2.2 Coordinator (holder) of course activities	PhD lecturer Anca Sorana POPA						
2.3 Coordinator (holder) of applied activities ⁶	PhD lecturer Anca Sorana POPA						
2.4 Year of study ⁷	3	2.5 Semester	1	2.6 Type of evaluation	assessment	2.7 Type of discipline ⁸	DI

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	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			
3.7* 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	3				
3.8* Total hours /semester	42				
3.9 Number of credits	4				

4. Prerequisites (where applicable)

4.1 Curriculum	Part I. Basic principles in mechatronics
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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.

	<ol style="list-style-type: none"> 1. Theoretical basics of mechatronics; 2. Information retrieval and processing systems; transducers-sensors-signal converters, multiplexers-demultiplexers; filters; 3. Microprocessors, microcontrollers, memories; oriented integrated circuits; 4. Digital subsystems of mechatronic systems; 5. Actuators, energy sources; 6. Mechatronic constructive elements <p>Part II. Applications of mechatronic processing</p> <ol style="list-style-type: none"> 7. Automotive mechatronics (ignition and injection processing, automatic gear change, brake assist, air conditioning and preheating etc.); 8. Multimedia mechatronics (mechatronic structure of sampling equipment, storage and playback of information with magnetic tapes and compact discs, computer transfer via satellites and optical fibers, conditional access in protected environments); 9. Household mechatronic machines, appliances and installations <ul style="list-style-type: none"> •
4.2 Competencies	<ul style="list-style-type: none"> • Basics of mechatronic systems

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"> • General knowledge in mechatronics, basics
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> • Knowledge in mechatronics, basics
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> •

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

7.1 The general objective of the discipline	The main purpose of the discipline is to familiarize future engineers with an overview and general issues related to the vast interdisciplinary field of Mechatronics, also emphasizing both the theoretical basis of the various
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	components and subsystems (identification, description, mode of operation, command and control, etc.), as well as on the multitude of applications that contain mechanical, electrical and / or electronic and computer subsystems (respectively with hardware and also with software).
7.2 Specific objectives	•

8. Content ¹¹

8.1 Course	Number of hours	Teaching methods ¹²
Theoretical basics of mechatronics	4	
Information retrieval and processing systems	4	
Microprocessors, microcontrollers, memories; oriented integrated circuits	4	
Digital subsystems of mechatronic systems	4	
Actuators, energy sources	2	
Mechatronic constructive elements	2	
Applications of mechatronic processing	2	
Automotive mechatronics	2	
Multimedia mechatronics	2	
Household mechatronic machines, appliances and installations	2	
Bibliography ¹³		
<ul style="list-style-type: none"> • Popa A.- Digital Control of Mechatronic Systems. Ed Orizonturi Universitare Timisoara 2002 • Gligor, O.- Mechatronic Structures. Ed Politehnica Timisoara 2003 • <i>Mechanical and Mechatronics Engineering</i>. "Mechatronics Engineering". Future undergraduate students. University of Waterloo. Retrieved 21 November 2019. • Faculty of Mechatronics, Informatics and Interdisciplinary Studies TUL. "Mechatronics (Bc., Inq., PhD.)". Retrieved 15 April 2011. • "Electromechanical/Mechatronics Technology" Archived 2014-05-16 at the Wayback Machine. Icti.org • Lawrence J. Kamm (1996). Understanding Electro-Mechanical Engineering: An Introduction to Mechatronics. John Wiley & Sons. ISBN 978-0-7803-1031-5. • "Motion Control and Advanced Mechatronics". • Bradley, David; Russell, David; Ferguson, Ian (March 2015). "The Internet of Things-The future or the end of mechatronics". <i>Mechatronics</i>. 27: 57–74. doi:10.1016/j.mechatronics.2015.02.005. hdl:10059/1355. 		
8.2 Applied activities ¹⁴		
1. Study of the processed movement of unipolar stepper motors	2	
2. Analog to digital converter (ADC)	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.).

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".

3. Experimental study of a stand with DC motor and 8-bit digital / analog converter, controlled by the parallel port of the PC	2	
4. Determining the characteristic of linear electromechanical actuators with reducer, used in the case of digital satellite reception	2	
5. Study of digital information multiplexing circuits with 8 channels on 8 bits	2	
6. Structural study, operating cycles and energy efficiency of the programmable microwave oven	2	
7. Recovery and end of the applied activity	2	
<ul style="list-style-type: none"> Bibliography¹⁵ Popa A.- Digital Control of Mechatronic Systems. Ed Orizonturi Universitare Timisoara 2002 		

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">
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10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁶	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	exam	exam	1/2
10.5 Applied activities	S:		
	L: test	test	1/2
	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"> Grade 5 			

Date of completion

23.11.2020

**Head of Department
(signature)**

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**Course coordinator
(signature)**

**Date of approval in the Faculty
Council¹⁹**

**Coordinator of applied activities
(signature)**

**Dean
(signature)**

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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.

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