

SYLLABUS

1. Information about the program

1.1 Higher education institution	UNIVERSITY POLITEHNICA OF TIMISOARA
1.2 Faculty ¹ / Department ²	ELECTRONICS, TELECOMUNICATON AND INFORMATION TECHNOLOGIES/MEO
1.3 Field of study (name/code ³)	ELECTRONIC ENGINEERING, TELECOMMUNICATION AND INFORMATION TECHNOLOGIES
1.4 Study cycle	License
1.5 Study program (name/code/qualification)	TST-ENG/20/20/10/100/10/TST-ENG

2. Information about the discipline

2.1 Name of discipline/ formative category ⁴	Medical Electronics and Informatics/DS						
2.2 Coordinator (holder) of course activities	S. I. dr. ing. Ionică Cora						
2.3 Coordinator (holder) of applied activities ⁵	S. I. dr. ing. Ionică Cora						
2.4 Year of study ⁶	4	2.5 Semester	8	2.6 Type of evaluation	E	2.7 Regime of discipline ⁷	DO

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) ⁸

3.1 Number of fully assisted hours / week	3 of which:	3.2 course	1,5	3.3 seminar / laboratory / project	0/1,5/0
3.1* Total number of fully assisted hours / semester	42 of which:	3.2* course	21	3.3* seminar / laboratory / project	0/21/0
3.4 Number of hours partially assisted / week	0 of which:	3.5 training	0	3.6 hours for diploma project elaboration	0
3.4* Total number of hours partially assisted / semester	0 of which:	3.5* training	0	3.6* hours for diploma project elaboration	0
3.7 Number of hours of unassisted activities / week	5,93 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			2
		hours of individual study after manual, course support, bibliography and notes			2
		training seminars / laboratories, homework and papers, portfolios and essays			1,93
3.7* Number of hours of unassisted activities / semester	83 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			28
		hours of individual study after manual, course support, bibliography and notes			28
		training seminars / laboratories, homework and papers, portfolios and essays			27
3.8 Total hours / week ⁹	8,93				
3.8* Total hours /semester	125				
3.9 Number of credits	5				

4. Prerequisites (where applicable)

¹ The name of the faculty which manages the educational curriculum to which the discipline belongs

² The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.

³ The code provided in HG - on the approval of the Nomenclature of fields and specializations / study programs, annually updated.

⁴ 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).

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

⁶ Year of studies in which the discipline is provided in the curriculum.

⁷ Discipline may have one of the following regimes: imposed discipline (DI) or compulsory discipline (DOb)-for the other fundamental fields of studies offered by UPT, optional discipline (DO) or optional discipline (Df).

⁸ 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.

⁹ The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4.1 Curriculum	•
4.2 Competencies	• Minimum Matlab and medium circuitry knowledge

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"> • Understand the general concepts of biomedical devices • Acquisition, analysis and processing of biomedical signals
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> • Application of basic methods for signal acquisition and processing.
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> • Methodical analysis of field-related problems aimed at identifying acknowledged solutions, thus ensuring the accomplishment of professional tasks

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"> • Understand the general concepts of biomedical devices
7.2 Specific objectives	<ul style="list-style-type: none"> • Analysis and processing of biomedical signals

8. Content ¹⁰

8.1 Course	Number of hours	Teaching methods ¹¹
Introduction to biomedical instrumentation. Signal conditioning – part 1	3	Slides, discussion
Introduction to biomedical instrumentation. Signal conditioning – part 2	3	
Biological signals , acquisition and processing.	3	
Biomedical sensors	3	
Principles of ultrasonography -part 1	3	
Principles of ultrasonography -part 2	3	
Basics of RMI imaging	3	

¹⁰ 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 "(*)".

¹¹ Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

Bibliography ¹² https://cv.upt.ro/course/view.php?id=2607 , pdf materials, video recordings		
8.2 Applied activities ¹³	Number of hours	Teaching methods
Introduction to matrix manipulations in Matlab	3	Exercises
Basic Matlab functions and commands	3	
Spectral analysis in Matlab	3	
Filter implementation in Matlab	3	
Matlab processing of biological signals	3	
Data acquisition from sensors (Matlab)	3	
Final Test	3	
Bibliography ¹⁴ https://cv.upt.ro/course/view.php?id=2607 , pdf materials, video recordings		

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 ¹⁵	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Sinthesys of course topics and few exercises	Written exam	0,5
10.5 Applied activities	S:		
	L: Matlab test on biological signals processing	Test on PC	0,5
	P¹⁶:	Presentation	
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified ¹⁷)			
• 5 for course exam and 5 for lab work			

Date of completion

10.06.2023

**Course coordinator
(signature)**

**Coordinator of applied activities
(signature)**

¹² 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.

¹³ 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".

¹⁴ At least one title must belong to the discipline team.

¹⁵ 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.)

¹⁶ 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.

¹⁷ It will not explain how the promotion mark is awarded.

**Head of Department
(signature)**

Date of approval in the Faculty Council ¹⁸

**Dean
(signature)**

14.09.2023

¹⁸ The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.