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/ EA
1.3 Field of study (name/code[3])	ELECTRONIC ENGINEERING, TELECOMUNICATION 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]	Applied Informatics 2/ DF						
2.2 Coordinator (holder) of course activities	Conf. dr. ing. Roland SZABÓ						
2.3 Coordinator (holder) of applied activities[5]	Drd. ing. Radu-Ștefan RICMAN						
2.4 Year of study[6]	2	**2.5** Semester	4	**2.6** Type of evaluation	D	**2.7** Regime of discipline[7]	DI

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	4 of which:	**3.2** course	2	**3.3** seminar / laboratory / project	0/2/0
3.1* Total number of fully assisted hours / semester	56 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	0/28/0
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	3.14 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			1.14
		hours of individual study after manual, course support, bibliography and notes			1
		training seminars / laboratories, homework and papers, portfolios and essays			1
3.7* Number of hours of unassisted activities / semester	44 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			16
		hours of individual study after manual, course support, bibliography and notes			14
		training seminars / laboratories, homework and papers, portfolios and essays			14
3.8 Total hours / week [9]	7.14				
3.8* Total hours /semester	100				
3.9 Number of credits	4				

4. Prerequisites (where applicable)

4.1 Curriculum	• Any Programming Language, Digital Integrated Circuits

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4.2 Competencies	• Basic Flow of Programming • Top Down and Bottom Up Approaches

5. Conditions (where applicable)

5.1 of the course	• Video projector
5.2 to conduct practical activities	• Laboratory with video projector and 8 test benches: computer, oscilloscope, signal generator, development board

6. Specific competencies acquired through this discipline

Specific competencies	• Applying basic knowledge, concepts and methods regarding the architecture of computing systems, microprocessors, microcontrollers, programming languages and techniques.
Professional competencies ascribed to the specific competencies	• Application of knowledge, concepts and basic methods related to computer system architecture, microprocessors, microcontrolers, programming languages and techniques..
Transversal competencies ascribed to the specific competencies	• Methodological analysis of the problems encountered in the activity, identifying the elements for which there are known solutions, this way ensuring the fulfillment of the 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	• Acquiring concepts specific to the design, implementation and maintenance of software applications.
7.2 Specific objectives	• Using the tools needed to design and implement software applications. • Developing software applications using the Python programming language.

8. Content [10]

8.1 Course	Number of hours	Teaching methods [11]
1. Programming languages. Introduction.	3	Interactive lecture, questioning, debate, verification
2. Basics of programming languages. Data types. Variables and expressions. Control structures. Functions. Functional programming elements in a programming language.	3	
3. Programming techniques. Programming algorithms.	3	
4. Data structures: lists, arrays.	3	
5. Data handling. Data extraction. .	3	
6. Organizing applications using external libraries. Standard libraries.	3	
7. File operations in a programming language. Data Serialization..	3	
8. Libraires for interfacing with hardware devices. Libraires for serial	3	

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[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.).

communication.		
9. Network programming. Sockets. Threads. Thread synchronization.	3	
10. Image processing in a programming language.	1	

Bibliography [12]   1. Hector Florez, Applied Informatics, Springer Nature Switzerland AG, 2021.
2. Mufti Mahmud, Cosimo Ieracitano, M. Shamim Kaiser, Nadia Mammone, Francesco Carlo Morabito, Applied Intelligence and Informatics, Springer, Berlin, 2023.

8.2 Applied activities [13]	Number of hours	Teaching methods
Laboratory: Programming language installation and software package management. Working with an interpreter. Integrated development environments.	4	Exposure, free discussion, questioning, practical application, verification
Laboratory: Types of data, variables and expressions. Control structures. Declaring and calling a function. Using data structures.	4	
Laboratory: Functional programming elements.	2	
Laboratory: Code testing. Testing and optimizing performance.	4	
Project: Developing a project using a programming language. Versioning systems.	2	Practical application
Project: Programming emebdded system with using a programming language.	6	Practical application
Project: Image processing. Image processing libraries.	6	Practical application

Bibliography [14]   1. Roger Lee, Computational Science/Intelligence & Applied Informatics, Springer Nature Switzerland AG, 2019.

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**

- The content of the discipline is in concordance with the approaches existing in other university centers in the country and abroad as well as with the requirements of the associations and employers interested in the field.

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Knowledge of fundamental notions and concepts.	Written evaluation	60%
10.5 Applied activities	**S:**		
	L: Applying knowledge to solve problems.	Evaluation with the help of the PC	20%
	P[16]**:** Applying knowledge to solve problems. Meet deadlines. Project presentation.	Oral evaluation	20%

[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.

	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])
•   Participation in planned activities; •   Appropriate knowledge and application of studied notions and concepts; •   Testing during the semester; •   Development and presentation of the project; •   Get the minimum score at written evaluations.

Date of completion	**Course coordinator** **(signature)**	**Coordinator of applied activities** **(signature)**
15.07.2023		

Head of Department **(signature)**	**Date of approval in the Faculty Council [18]**	**Dean** **(signature)**
	14.09.2023	

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[17] It will not explain how the promotion mark is awarded.
[18] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.