

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	Software Engineering and Applications/DS						
2.2 Coordinator (holder) of course activities	Conf. dr. ing. Roland SZABÓ						
2.3 Coordinator (holder) of applied activities ⁵	Conf. dr. ing. Roland SZABÓ						
2.4 Year of study ⁶	4	2.5 Semester	7	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	0/1/1
3.1* Total number of fully assisted hours / semester	56 of which:	3.2* course	28	3.3* seminar / laboratory / project	0/14/14
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
		hours of individual study after manual, course support, bibliography and notes			1.14
		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			14
		hours of individual study after manual, course support, bibliography and notes			16
		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)

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	<ul style="list-style-type: none"> • Object Oriented Programming • Digital Integrated Circuits
4.2 Competencies	<ul style="list-style-type: none"> • Basic Flow of Programming • Top Down and Bottom Up Approaches

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> • Video projector
5.2 to conduct practical activities	<ul style="list-style-type: none"> • Laboratory with video projector and 8 test benches: computer, oscilloscope, signal generator, development board

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Application of knowledge, concepts and basic methods related to computer system architecture, microprocessors, microcontrollers, programming languages and techniques.
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 • Adaptation to new technologies, professional and personal development through continuous training, using printed documentation sources, specialized software and electronic resources in Romanian and at least one foreign language.

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"> • The course is designed to develop in students the knowledge, understanding, skills and values to solve problems through the creation of software solutions.
7.2 Specific objectives	<ul style="list-style-type: none"> • Programming techniques • Project management.

8. Content¹⁰

8.1 Course	Number of hours	Teaching methods ¹¹
1. PLC Basics, PLC Instruction Set	3	Slides, discussion
2. Telecommunication System (Mobile Phone) Applications	3	
3. Biometry Overview, Introduction	3	
4. Fingerprint Identification, Palm Recognition	3	
5. Iris Recognition, Retina Technology.	3	
6. Steganography, Spoof and Vulnerability	3	
7. IDE, ICD2, Proteus.	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.).

8. BLDC Control, Analog Sensors Software, DAQ	3	
9. Bootloaders, Tire Pressure Monitoring (TPM) System, Achieving Higher ADC Resolution Using Oversampling	3	
10. RS232, RS422, RS485, DB Easy	1	
Bibliography ¹² 1. McConnell, S., Code Complete: A Practical Handbook of Software Construction, Microsoft Press, 2004. 2. Gamma, E., Helm R., Johnson R., Vlissides, J., Design Patterns: Elements of Reusable Object-Oriented Software, Addison-Wesley, 2005.		
8.2 Applied activities ¹³	Number of hours	Teaching methods
NI CompactRIO Control and Acquisition System NI CompactRIO installing & FPGA Chassis programming NI CompactRIO Real-Time Controller Programming NI CompactRIO Networked RealTime Host Program Development NI CompactRIO Windows Host Program Development	4	Exercises
SIEMENS SIMATIC S7-200 Programmable Controller	2	
Microcontroller Programming with MPLAB IDE. Simulation with Proteus	2	
PIC Voltage Meter Using LCD	2	
BLDC Motor Control	2	Exercises
Data Acquisition (DAQ)	2	Exercises
Project – Creating an Application on a Telecommunication System (Mobile Phone)	14	Project Implementation
Bibliography ¹⁴ Szabo, R., Software Development Applications, Politehnica, 2016.		

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	Gaining knowledge related discipline, understanding technologies / methods presented	Written exams, 2 x 1.5 hrs.	60%
10.5 Applied activities	S:		
	L: Level of familiarity with the various topics presented	Continuous assessment, written and oral examination	20%
	P¹⁶: Project result success and presentation	Presentation	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.)

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)		
<ul style="list-style-type: none"> • 5 for course exam and 5 for laboratory 		

Date of completion

15.06.2023

**Course coordinator
(signature)**

**Coordinator of applied activities
(signature)**

**Head of Department
(signature)**

Date of approval in the Faculty Council ¹⁸

14.09.2023

**Dean
(signature)**

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.

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