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]			FUNDAMENTALS ELECTRONIC CIRCUITS PROJECT/DD				
2.2 Coordinator (holder) of course activities							
2.3 Coordinator (holder) of applied activities[5]			Sl. Dr.ing. PAPAZIAN PETRU				
2.4 Year of study[6]	2	**2.5** Semester	4	**2.6** Type of evaluation	P-D	**2.7** Regime of discipline[7]	DII

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	2 of which:	**3.2** course		**3.3** seminar / laboratory / project	0/0/2
3.1* Total number of fully assisted hours / semester	28 of which:	**3.2*** course		**3.3*** seminar / laboratory / project	0/0/28
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	3.36 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
		training seminars / laboratories, homework and papers, portfolios and essays			1.36
3.7* Number of hours of unassisted activities / semester	47 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			14
		training seminars / laboratories, homework and papers, portfolios and essays			19
3.8 Total hours / week [9]	5.36				
3.8* Total hours /semester	75				
3.9 Number of credits	3				

4. **Prerequisites** (where applicable)

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[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	• Electronic components, materials and technologies, Digital Integrated Circuits
4.2 Competencies	• Functional description of electronic circuits and devices. Know-how of fundamental measurement methods of electrical quantities. Capability to use software applications specific to applied electronics

5. Conditions (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	• 16 places laboratory containing: • 6 Personal computers with Internet access and specific CAE/CAD software • 2 working places provided with power supply, signal generator, oscilloscope, multimeter • 4 working places provided with tools for PCB soldering, soldering irons

6. Specific competencies acquired through this discipline

Specific competencies	• C1-Using of fundamental concepts regarding electronic circuits, devices, systems, measurement tools and technology (0,5); • C4-Design and use of hardware and software applications of low level complexity specific to applied electronics (0,5); • C6-Finding proper solutions to technologic issues regarding applied electronics (0,5).
Professional competencies ascribed to the specific competencies	• Use of fundamentals in terms of devices, circuits, systems, instrumentation and electronics technology. • Solving technological problems in fields of applied electornics.
Transversal competencies ascribed to the specific competencies	• Methodical analysis of field-related problems aimed at identifying acknowledged solutions, thus ensuring the accomplishment of professional tasks. • Definition of activity stages and their distribution to subordinates in terms of responsabilities, providing effective exchange of information and interpersonal communication.

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

7.1 The general objective of the discipline	• Introducing students to the main aspects regarding design, simulation and physical production of medium complexity electronic systems.
7.2 Specific objectives	• Graduating Electronic Circuits Project, students will acquire abilities regarding Printed Circuit Board design and gain competencies and the know-how to design and simulate electronic circuits, soldering components, testing and starting-up electronic systems and making of experimental measurements.

8. Content [10]

8.1 Course	Number of hours	Teaching methods [11]

[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]		
8.2 Applied activities [13]	Number of hours	Teaching methods
1.Electronic schematic design based on the received block diagram.	4	Oral presentation of working principles of digital circuits and systems. Circuit drawing on the blackboard. Circuit simulation using CAE/CAD design tools. Explaining major rules of PCB design and Gerber files generation. Exposing the possibilities of physical realization of the PCB at a dedicated manufacturing company. Offering necessary tools for students to place and solder the components on the PCB. Guiding the students to test, start-up and to make experimental measurements regarding the designed system
2.Simulation of the above mentioned electronic schematic.	4	
3.PCB design and Gerber files generation.	4	
4.Component soldering on the PCB.	3	
5.System start-up.	3	
6.Experimental measurements and testing.	4	
7.Making of the required documentation (with cost study) and PowerPoint presentation	4	
8.Oral project presentation and final grading	2	
Bibliography [14] 1.Papazian P., "Circuite Integrate Digitale. Simulări şi experimente", Editura Politehnica Timişoara, 2013, ISBN: 978-606-554-656-1, 130pg. 2. G. Simion, P. Papazian, „Digital Integrated Circuits Practical Aspects”, Editura Politehnica 2015 3. M.Băbăiţă, "Circuite integrate digitale. Culegere de probleme", Editura Politehnica, Timişoara, 2012, ISBN 978-606-554-264-4, pg.203; 4. Mureşan T., Gontean A., Băbăiţă M., Circuite digitale, Editura de Vest, Timişoara, 2007, 218pg., ISBN 978-973-36-0454-9;		

[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.

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 was discussed with the representatives of Continental SA and Hella Romania companies and was corroborated with their necessities.

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course			
10.5 Applied activities	**S:**		
	L:		
	P[16]**:** Distributed verification and grading. During the semester there are four due-dates with four grades regarding: 1.Complete electronic schematic design; 2.Functional simulation of each bloc of the system; 3.PCB design according to exposed rules with paper printed version and Gerber files; 4.Oral presentation of the entire project.		1
	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])			
• Each team must present a physical PCB with all components soldered accordingly. The system will be powered-up and there must be no “short-circuit” phenomenon. All ICs must have corresponding supply voltage at the specified pins.			

Date of completion 21.06.2023	**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)**

[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.

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