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]			Materials for Electronics /DD				
2.2 Coordinator (holder) of course activities			Conf.dr.ing. Adrian Popovici				
2.3 Coordinator (holder) of applied activities[5]			Popovici A, Mutiu R.				
2.4 Year of study[6]	1	**2.5** Semester	2	**2.6** Type of evaluation	E	**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	1/1/0
3.1* Total number of fully assisted hours / semester	56 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	14/14/0
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	3.14 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				

[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. **Prerequisites** (where applicable)

4.1 Curriculum	• Mathematics, Physics
4.2 Competencies	•

5. **Conditions** (where applicable)

5.1 of the course	• Projector and whiteboard
5.2 to conduct practical activities	•

6. **Specific competencies** acquired through this discipline

Specific competencies	• Using fundamentals • • relating to electronic passive components, devices, circuits, • • systems, instrumentation and • • electronic technology
Professional competencies ascribed to the specific competencies	• Use of fundamentals in terms of devices, circuits, systems, instrumentation and electronics technology, • Application of knowledge, concepts and basic methods related to computer system architecture, microprocessors, microcontrolers, programming languages and techniques, • 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, • 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	• The course provides basic theoretical and practical knowledge on materials and components used in electronics and electronic technology. The components are studied with emphasis on functional description, production technology and specific parameters
7.2 Specific objectives	• Using fundamental elements relating to the circuits, systems, instrumentation and electronic technology. • The design and use of hardware and software applications specific for low complexity applied electronics. • Methodical analysis of the problems encountered in work, identifying items for which there are dedicated solutions, thus ensuring professional tasks. • Adapting to new technologies, professional and personal development through continuing education using printed documentation sources, specialized software and electronic. • Solving problems in the areas of applied electronics technology

8. **Content** [10]

8.1 Course	Number of hours	Teaching methods [11]
1. Introduction	1	

[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.).

2. Dielectric materials and applications	8	Exposition, lecture, conversation, explanation, eg., presentation slides, demonstrations blackboard, discussions with students
3. Magnetic materials and applications	8	
4. Conductor materials and applications	8	
5. Semiconductor materials and applications	3	

Bibliography [12] Popovici Adrian Electronic Components, Technology and Materials S2-L-ETCTI-ENG1-ECTM https://cv.upt.ro/course/view.php?id=1821

D. Jiles, Introduction to the Electronic Properties of Materials, Chapman & Hall, London, 1994
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Blackwell, Glenn R., The electronic packaging handbook, Florida, CRC Press LLC, 2000
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José Pineda de Gyvez , Integrated circuit manufacturability the art of process and design integration, IEEE Press Institute of Electrical and Electronics Engineers, 1999
J.D. Livingstone, Electronic Properties of Engineering Materials; Wiley, Massachusetts Institute of Technology, Cambridge, 1999
W. Bolton, Electrical and Magnetic Properties of Materials, Longman Scientific & Technical, Essex, 1992
P. Svasta, V. Golumbeanu, Noutăţi în packagingul componentelor electronice pasive, Politehnica Press, Bucureşti, 2001.
B. Van Zeghbroeck, Principles of Semiconductor Devices, University of Colorado,

8.2 Applied activities [13]	Number of hours	Teaching methods
Laboratory		Conversation, explanation, example, experiment, demonstration, comparative analysis, simulation, case study, brainstorming
Equipments for electronics	2	
Computer simulation of the behavior of dielectric and magnetic materials	2	
The study of dielectric materials	2	

[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".

The study of magnetic materials	2	
The study of passive components used in electronics	4	
Influence of manufacturing tolerance for passive electronic components on the parameters of electronic circuits	2	
Seminar		Conversation, explanation, example, demonstration, comparative analysis, case study, brainstorming
Applications of dielectric materials Applications of magnetic materials Applications of conductor materials Applications of semiconductor materials Influence of manufacturing tolerance of electronic components on the parameters of electronic circuits	4 4 2 2 2	

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D. Jiles, Introduction to the Electronic Properties of Materials, Chapman & Hall, London, 1994
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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

- Following the course titular contacts with representatives of the specialized companies in Timisoara the course content was discussed and mutually agreed. The focus is on the development of fundamental knowledge in electronics, documentation skills, development in electronics, developing collaborative skills for the development of a project

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Students participation in discussions related to the specific discipline	Students participation in discussions on specific topic, Campus Virtual Assignments	1/3 NP
10.5 Applied activities	**S:** Individual activity in seminar classes	Students participation in discussions on specific topic, Campus Virtual Assignments	1/3 NP
	L: Individual activity in laboratory classes	Students participation in discussions on specific topics	1/3 NP
	P[16]**:**		
	Pr:		

[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.

10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [17])
• Written exam, theoretical subjects and solving specific applications. The final grade • results as an average between final examination (50%) and note the overall activities (50%) Duration: 3:00 • 4 questions / topics covering theoretical / applications in relation 1/1; • Examination room is set by the Dean • • To pass discipline it is necessary to know the main characteristics of the materials used in electronics, their main applications and to know how to calculate the parameters required for a specific application

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
10.07.2023		
Head of Department (signature)	**Date of approval in the Faculty Council [18]**	**Dean (signature)**
	14.09.2023	

[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.