SYLLABUS[1]

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[2] / Department[3]	Faculty of Electronics, Telecommunications and Information Technology / Department of Communications
1.3 Chair	—
1.4 Field of study (name/code[4])	Electronics, telecommunications and information technology Engineering / 100
1.5 Study cycle	Bachelor
1.6 Study program (name/code)/Qualification	Telecommunication Systems Technology (English)

2. Information about the discipline

2.1 Name of discipline			Electronic Equipment Testing				
2.2 Coordinator (holder) of course activities			Prof.dr.eng. VASIU Radu				
2.3 Coordinator (holder) of applied activities [5]			As.dr.eng. TERNAUCIUC Andrei				
2.4 Year of study[6]	IV	**2.5** Semester	I	**2.6** Type of evaluation	Exam	**2.7** Type of discipline	Compulsory

3. Total estimated time (hours / semester of didactic activities)

3.1 No. of hrs. / week	4 , of which:	**3.2** course	2	**3.3** seminar/laboratory/ project/training	2
3.4 Total no. of hrs. in the education curricula	56 , of which:	**3.5** course	28	**3.6** applied activities	28
3.7 Distribution of time for individual activities related to the discipline					hrs.
Study using a manual, course materials, bibliography and lecture notes					28
Additional documentation in the library, on specialized electronic platforms and on the field					4
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					21
Tutoring					
Examinations					3
Other activities					
Total hrs. of individual activities					56
3.8 Total hrs. / semester[7]	112				
3.9 No. of credits	5				

4. Prerequisites (where applicable)

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1 The form corresponds to the Syllabus promoted by OMECTS 5703/18.12.2011 (Annex3).

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

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

4 Fill in the code provided in GD no. 493/17.07.2013.

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

6 The year of study to which the discipline is provided in the curriculum.

7 It is obtained by summing up the number of hrs. from 3.4 and 3.7.

4.1 Curriculum	• No specific requirements.
4.2 Competencies	• No specific requirements.

5. **Conditions** (where applicable)

5.1 of the course	• Video-projector.
5.2 to conduct practical activities	• Specialized hardware and software equipment.

6. **Specific competencies acquired**

Professional competencies[8]	• C1. Using fundamental concepts relating to devices, circuits, systems, instrumentation and electronic technology • C2. Applying basic methods for signal acquisition and processing • C3. Applying acquired knowledge, concepts and basic methods relating to computing systems architecture, microprocessors, microcontrollers, programming languages and techniques • C4. Designing, implementing and operating services relating to data, voice, video, multimedia, based on understanding and applying the fundamental concepts of communication and information transmission • C5. Selection, installation, configuration and operation of fixed and mobile telecommunications equipment and equipping a site with basic telecommunications networks • C6. Solving specific problems related to broadband communication networks: propagation in various broadcasting environments, high-frequency circuits and equipment (microwave and optical)
Transversal competencies	• CT1. Applying methodical analysis of the problems encountered, identifying issues for which there are dedicated solutions, ensuring the completion of professional tasks • CT3. Adapting to new technologies, professional and personal development through training by way of documentation using printed sources, specialized software and electronic resources

7. **Objectives of the discipline** (based on the grid of specific competencies acquired)

7.1 General objective of the discipline	• Providing basic theoretical concepts related to component level testing techniques, equipped wafer and equipment, as well as familiarize the students with the main methods used to test the functional performance of the main classes of electronic equipment
7.2 Specific objectives	• Getting used with the main fault models used for characterizing electronic components and equipment • Presentation of the techniques for parametric and functional testing of electronic components • Presentation of the techniques for generating test stimuli • Presentation of on-line and off-line testing techniques for electronic equipment • Getting used with the concepts of design for testability • Getting used with the basic concepts for Fault Tolerant Equipment

8 The professional competencies and the transversal competencies will be treated according to the Methodology of OMECTS 5703/18.12.2011. The competencies listed in the National Register of Qualifications in Higher Education [Registrul Național al Calificărilor din Învățământul Superior RNCIS] (http://www.rncis.ro/portal/page?_pageid=117,70218&_dad=portal&_schema=PORTAL) will be used for the field of study from 1.4 and the program of study from 1.6 of this form, involving the discipline.

8. Content

8.1 Course	No. of hours	Teaching methods
Place of the testing activities in the production process. Objectives of the testing process. Principles. Testing levels.	2	Providing all educational materials through the UPT Virtual Campus prior to the course, the use of ppt slides for the course, interposing interactive session of questions and answers based on materials provided in advance, the use of applied sessions for the provision of exercises recommended for preparing the final exam.
Fault models for digital circuits	2	
Electronic components' level testing. Testing the capsules of digital integrated circuits	4	
Equipped wafer level testing	6	
Test sequences' generation for combinational logic circuits	4	
Automated test equipment	2	
Digital communication networks' testing	2	
Fault location in telecommunication cables	2	
Principles of design for testability	2	
Principles for realizing Fault Tolerant Systems	2	

Bibliography[9]

1. Radu Vasiu, *Testarea echipamentelor electronice*, Ed. Orizonturi Universitare, Timișoara, 2001

2. D. Pitică, M. Radu: *Elemente de testare pentru sisteme electronice*, Ed. Albastră, Cluj-Napoca, 2001

3. B. Abramovici, *Digital Systems Testing and Testable Design*, IEEE Press, 1994

4. Parag K. Lala, *Practical Digital Logic Design and Testing*, Prentice Hall, 1996

8.2 Applied activities[10]	No. of hours	Teaching methods

[9] At least one title must belong to the department staff teaching the discipline, and at least 3 titles must refer to national and international works relevant for the discipline, and which can be found in the Politehnica University Library.

The Signature Analyzer. History. Functionality.	2	Providing materials for laboratory sessions in advance through the UPT Virtual Campus, experimentation, drawing conclusions and discussing results.
The block diagram of the Signature Analyzer. Signature generating polynomials	2	
The serial and parallel Signature Analyzer	4	
Designing a Signature Analyzer	4	
Testing communication systems with magnetic recording	2	
Testing communication systems with optical recording	2	
Testing a video transmission chain	2	
The functional testing of a Computing System	4	
Evaluation	4	
Bibliography [11] 1. Laboratory online materials – Available on the CVUPT e-Learning platform; Authors: Ternauciuc A., Vasiu R. 2. D.J. Garland, F.W. Stainer, *Modern Electronic Maintenance Principles*, Elsevier, 2016 3. Dhanasekharan Natarajan, *Reliable Design of Electronic Equipment: An Engineering Guide*, Springer, 2014 4. B.S. Dhillon, *Computer System Reliability: Safety and Usability*, CRC, 2013		

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

- Course content is underpinned by expectations specialized companies following discussions on curricula held in the Board of specialization. Through inter-university agreements (Erasmus + and others) are conducted mobility of students, which confirms the international compatibility of the content provided.

10. Evaluation

Type of activity	**10.1** Evaluation criteria	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Theoretical subjects and problems solving.	Written examination.	60%
10.5 Applied activities	**S:**		
	L: Knowledge recall and application	Written tests; practical skills assessments	40%
	P:		

[10] The types of applied activities are those specified in footnote 5. If the discipline contains several types of applied activities, then these will be written consecutively in the lines of the table below. The type of activity will be written in a distinct line, as „Seminar:", „Laboratory:", „Project:" and/or „Practice/Training:".
[11] At least one title must belong to the staff teaching 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)			
• For passing the examination, the student needs to understand the basic principles of component-level testing, wafer-equipped and equipment level testing, as well as to have the knowledge on how to operate the main equipment used (automated tester and signature analyzer). Minimum grade to pass exam/activity: 5.00			

Date of completion	**Course coordinator**	**Coordinator of applied activities**
	(signature)	**(signature)**
24.01.2017		
	.....	.....
Head of Department	**Date of approval in the Faculty Council**[12]	**Dean**
(signature)		**(signature)**
.....		.....

[12] Avizarea este precedată de discutarea punctului de vedere al board-ului de care aparţine programul de studiu cu privire la fişa disciplinei.