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
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]	DIGITAL COMMUNICATIONS / DS						
2.2 Coordinator (holder) of course activities	Florin ALEXA						
2.3 Coordinator (holder) of applied activities[5]	Teodor PETRITA						
2.4 Year of study[6]	IV	**2.5** Semester	8	**2.6** Type of evaluation	E	**2.7** Regime of discipline[7]	DO

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	3 of which:	**3.2** course	1.5	**3.3** seminar / laboratory / project	1.5
3.1* Total number of fully assisted hours / semester	42 of which:	**3.2*** course	21	**3.3*** seminar / laboratory / project	21
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	5.93 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			2
		hours of individual study after manual, course support, bibliography and notes			2
		training seminars / laboratories, homework and papers, portfolios and essays			1.93
3.7* Number of hours of unassisted activities / semester	83 of which	additional documentary hours in the library, on the specialized electronic platforms and on the field			28
		hours of individual study after manual, course support, bibliography and notes			28
		training seminars / laboratories, homework and papers, portfolios and essays			27
3.8 Total hours / week [9]	8.93				
3.8* Total hours /semester	125				
3.9 Number of credits	5				

4. Prerequisites (where applicable)

4.1 Curriculum	• Signal processing

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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) $\geq$ 28 hours / wk. and (3.8) $\leq$ 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.

	• Radio communications
	• Audio and Video Systems
4.2 Competencies	•

5. Conditions (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	•

6. Specific competencies acquired through this discipline

Specific competencies	• Application of basic methods for acquisition and signal processing • design, implementation and operation of services of data, voice, video, multimedia, based on understanding and applying fundamental concepts in the field of communications • Selection, installation, configuration and exploitation of fixed and mobile telecommunications equipment and equipping a site with usual telecommunications networks
Professional competencies ascribed to the specific competencies	• Application of basic methods for acquisition and signal processing • design, implementation and operation of services of data, voice, video, multimedia, based on understanding and applying fundamental concepts in the field of communications • Selection, installation, configuration and exploitation of fixed and mobile telecommunications equipment and equipping a site with usual telecommunications networks
Transversal competencies ascribed to the specific competencies	• Methodical analysis of the problems encountered in activity, identifying items for which there are dedicated solutions, thus ensuring professional tasks • Adaptation to the new technologies, professional and personal development through continuing education using printed documentation sources, specialized software and electronic resources

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

7.1 The general objective of the discipline	• Knowing radio and TV transmitters and solutions used for power transmitter. Understanding the principles of digital broadcasting, and presentation of the latest generation of digital broadcasting systems.
7.2 Specific objectives	• The parameters and architectures for the main solution for analog and digital radio transmitters used in one way communication.

8. Content [10]

8.1 Course	Number of hours	Teaching methods [11]
Introduction in broadcasting systems principles of broadcasting and main structure for high power transmitter.	3	
AM and FM transmitters	2	
TV transmitters	2	

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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.).

Stereo and RDS systems (principles, signal processing, architectures for transmitters and receivers)	2	
Principles of multi carrier transmission	4	
Digital Audio Broadcasting	4	
Digital Video Broadcasting	4	

Bibliography [12]

1. E. Marza - Radiodifuziune. Editura Orizonturi Universitare, Timisoara 2001

2. Rice, Michael - Digital communications : a discrete-time approach. Upper Saddle River, New Jersey: Pearson Education International: Prentice Hall, 2009

3. Fl. Alexa – Radiocomunicații 2, prezentări - intranet.etc.upt.ro

4. Kolimbiris, Harold. Digital comunications systems : With satellite and fiber optics applications. New Jersey [etc.]: Prentice Hall, [2000]

5. Proakis, John G.. Digital communications. Boston, McGraw-Hill, [2001]

6. ETSI TS 101 545-1 V1.2.1 (2014-04)

7. ETSI EN 302 755 V1.3.1 (2012-04) - Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)

8.2 Applied activities [13]	Number of hours	Teaching methods
Digital transmission: ASK modulation	3	
Digital transmission: FSK modulation	3	
Digital transmission: QAM modulation	3	
Software Defined Radio – study of digital systems for transmitting and processing the information	6	
DAB Coder and Decoder – MATLAB simulation	3	
DVB Coder and Decoder – MATLAB simulation	3	

Bibliography [14]

1. Vesa Andy-Răzvan, Călin-Mihai Simu - Radiocomunicații, Experimente și aplicații – Editura Orizonturi Universitare, Timișoara, 2015

2. Proakis, John G.. Digital communications. Boston, McGraw-Hill, [2001

3. ETSI TS 101 545-1 V1.2.1 (2014-04)

4. ETSI EN 302 755 V1.3.1 (2012-04) - Digital Video Broadcasting (DVB); Frame structure channel coding and modulation for a second generation digital terrestrial television broadcasting system (DVB-T2)

5. Teodor Petriţa – Radiocomunicaţii: receptoare definite software, Editura Orizonturi Universitare, 2019, ISBN 978-973-638-643-5

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**

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[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.

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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	Exam, 2 h	50%
10.5 Applied activities	**S:**		
	L: level of familiarity with the various topics presented	Continuous assessment, written and oral examination	
	P[16]**:**		
	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])			
- The minimum mark in order to pass the examination is 5, corresponding to basic understanding of the theoretical aspects of the course and the ability of solving simple numerical applications similar to the examples presented in the course			

<table>
<tr><td>Date of completion
29.07.2023</td><td>Course coordinator
(signature)</td><td>Coordinator of applied activities
(signature)</td></tr>
<tr><td>Head of Department
(signature)</td><td>Date of approval in the Faculty Council [18]
14.09.2023</td><td>Dean
(signature)</td></tr>
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[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.