SYLLABUS[1]

1. Information about the program

1.1 Higher education institution	UNIVERSITATEA POLITEHNICA TIMIŞOARA
1.2 Faculty[2] / Department[3]	ELECTRONICĂ ŞI TELECOMUNICAŢII / COMUNICATII
1.3 Chair	–
1.4 Field of study (name/code[4])	INGINERIE ELECTRONICĂ ŞI TELECOMUNCAŢII/100
1.5 Study cycle	LICENŢA
1.6 Study program (name/code)/Qualification	ELECTRONICS AND TELECOMMUNICATIONS

2. Information about the discipline

2.1 Name of discipline			Dgital Switching Systems				
2.2 Coordinator (holder) of course activities			Şl. dr. ing. Balint Cornel				
2.3 Coordinator (holder) of applied activities [5]			Şl. dr. ing. Balint Cornel				
2.4 Year of study[6]	III	**2.5** Semester	2(6)	**2.6** Type of evaluation	E	**2.7** Type of discipline	Optional

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	12
Additional documentation in the library, on specialized electronic platforms and on the field	4
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays	11
Tutoring	4
Examinations	3
Other activities	
Total hrs. of individual activities	34

3.8 Total hrs. / semester[7]	90
3.9 No. of credits	4

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	•
4.2 Competencies	•

5. **Conditions** (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	•

6. **Specific competencies acquired**

Professional competencies[8]	• Aptitude to apply and use fundamental elements of electronic devices, circuits, systems, instrumentation and technology • Conception, implementation and operation of data, voice, video and multimedia services based on understanding and application of fundamental concepts of the fields of communications and information transmission • Selection, installation, configuration and operation of fixed and mobile telecommunications equipment and provision of a location with usual telecommunications equipment
Transversal competencies	• Methodical analysis of common problems met in activity by identification of elements that admit known solutions, ensuring in this way fulfilment of professional assignments • Adaptation to new technologies, professional and personal development by continuous formation, relying on printed documents, dedicated software and electronic resources in Romanian and in at least one foreign language

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

7.1 General objective of the discipline	• Basic knowledge on digital switching principles and digital switching systems
7.2 Specific objectives	• Study of DSS typical structure and DSS components: the switching network, control unit, subscriber interface, and a typical structure of VoIP network and VoIP protocols

8. **Content**

8.1 Course	No. of hours	Teaching methods
The telephone network. Components and organization. Structure and functions of DSS	2	The course is organized as exposure
Digital switching. T, S, extended T switching	2	Students are involved
Switching networks	2	through questions and
ATM and ATM switching	2	discussion.
Traffic and blocking probability in switching systems	2	The course topics are
Signaling in telephone network. Subscriber line signaling	2	fixed by homeworks
Interexchange signaling. SS7 signaling system	2	
DSS Alcatel 1000E10B. Hardware and logical structure	2	

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 Naţional al Calificărilor din Învăţământul 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.

DSS Alcatel 1000E10B. Multiprocessor stations. Switching matrix.	2	
DSS Siemens EWSD, Ericsson AXE	2	
Voice over IP.	2	
Voice over IP: RTP, RTCP protocols	2	
Voice over IP: H323, SIP and MGCP protocols	2	
Perspectives in the evolution of digital switching systems. IN-Intelligent Network, NGN-Next Generation Network	2	

Bibliography[9]

T. Rădulescu, *Reţele de telecomunicaţii;* Editura Thalia, Bucureşti, 2003.

G. Niculescu, L. Ioan, *Tehnici şi sisteme de comutaţie;* Editura MatrixRom, Bucureşti, 2000.

M. Oteşteanu, F. Alexa, C. Balint, *Telefonie numerică. Alcatel 1000E10B,* Editura de Vest, Timişoara. 2004.

J. Bellamy, Digital Telephony, Third Edition, John Wiley and Sons, 2000

C. Balint, Digital Switching Systems, course notes, available online https://intranet.etc.upt.ro/~DIG_SW_SYST

8.2 Applied activities[10]	No. of hours	Teaching methods
Laboratory:	28	
The telephone	2	The practical laboratory
Subscriber line signaling	2	work is followed by
T and S digital switching	2	discussion and results analysis
DSS Alcatel 1000E10B. General structure. Multiprocessor stations. Switching matrix. Routing, numbering and charging plan. Subscriber line management. Subscriber line testing	12	Practical works are made using models for experimental study of digital switching, Voice over IP platform and DSS Alcatel 1000E10B.
Signaling system SS7	4	
Set up VoIP experimental network	4	

Bibliography [11]

1. M. Oteşteanu, F. Alexa, C. Balint, *Telefonie numerică. Alcatel 1000E10B,* Editura de Vest, Timişoara. 2004

2. Online: https://intranet.etc.upt.ro/~ DIG_SW_SYST

[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.

[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.

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 was determined through discussions with representatives of employers in order to provides theoretical and practical understanding of the structure and operation of the telephone network

10. Evaluation

Type of activity	**10.1** Evaluation criteria	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Evaluate the understanding of fundamental DSS concepts and how to apply them to solve simple applications	Written exam; date and place planned and announced in advance. The exam consists of 15 subjects covering course topics.	66%
10.5 Applied activities	**S:**		
	L: Evaluate how to understand the theoretical support of laboratory work, how to carry out the experimental results and personal observations	Discussions and written test at each laboratory	33%
	P:		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
• Knowledge of at least the general structure of the telecommunications network and switching center block diagram, principles of T and S switching and multistage switching networks, and basics of VoIP. Homework, lab tests and written exam.			

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

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