

# SYLLABUS<sub>1</sub>

## 1. Information about the program

1.1 Higher education institution	POLITEHNICA UNIVERSITY TIMISOARA
1.2 Faculty <sub>2</sub> / Department <sub>3</sub>	FACULTY OF ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES/ COMMUNICATIONS
1.3 Chair	—
1.4 Field of study (name/code <sub>4</sub> )	ELECTRONICS, TELECOMMUNICATIONS AND INFORMATION TECHNOLOGIES ENGINEERING / 100
1.5 Study cycle	LICENSE
1.6 Study program (name/code)/Qualification	TELECOMMUNICATIONS TECHNOLOGIES AND SYSTEMS / 20202010020 / Telecommunications technologies and systems

## 2. Information about the discipline

2.1 Name of discipline	INTEGRATED DIGITAL NETWORKS						
2.2 Coordinator (holder) of course activities	ALEXA FLORIN						
2.3 Coordinator (holder) of applied activities <sub>5</sub>	POPA GHEORGHE-DANIEL						
2.4 Year of study <sub>6</sub>	IV	2.5 Semester	7	2.6 Type of evaluation	E	2.7 Type of discipline	DS

## 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					16
Additional documentation in the library, on specialized electronic platforms and on the field					4
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays					10
Tutoring					1
Examinations					3
Other activities					
<b>Total hrs. of individual activities</b>					<b>34</b>
3.8 Total hrs. / semester <sub>7</sub>		90			
3.9 No. of credits		4			

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

<sup>2</sup> The name of the faculty which manages the educational curriculum to which the discipline belongs.

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

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

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

<sup>6</sup> The year of study to which the discipline is provided in the curriculum.

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

#### 4. Prerequisites (where applicable)

4.1 Curriculum	<ul style="list-style-type: none"><li>Digital telephony</li></ul>
4.2 Competencies	<ul style="list-style-type: none"><li></li></ul>

#### 5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"><li></li></ul>
5.2 to conduct practical activities	<ul style="list-style-type: none"><li></li></ul>

#### 6. Specific competencies acquired

Professional competencies <sup>8</sup>	<ul style="list-style-type: none"><li>Application of basic methods for acquisition and signal processing</li><li>Design, implementation and operation of services of data, voice, video, multimedia, based on understanding and applying fundamental concepts in the field of communications</li><li>Selection, installation, configuration and exploitation of fixed and mobile telecommunications equipment and equipping a site with usual telecommunications networks</li></ul>
Transversal competencies	<ul style="list-style-type: none"><li>Methodical analysis of the problems encountered in activity, identifying items for which there are dedicated solutions, thus ensuring professional tasks</li><li>Adaptation to the new technologies, professional and personal development through continuing education using printed documentation sources, specialized software and electronic resources</li></ul>

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

7.1 General objective of the discipline	<ul style="list-style-type: none"><li>The main objective is the introduction to real-time communication systems using circuit-based switching and multiplexing. Other objectives are defining the standards, methods and circuits used in fixed and mobile networks today. The final goal is the understanding of the integration of these networks (voice, video, data) with packet switching and multiplexing.</li></ul>
7.2 Specific objectives	<ul style="list-style-type: none"><li></li></ul>

#### 8. Content

8.1 Course	No. of hours	Teaching methods
The telephone network evolution	1 hour	exposure, direct interaction with the student, practical examples, comparative analyzes
PCM CODEC	3 hours	

<sup>8</sup> 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](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.

Hierarchical TDM - Positive justification, PDH, SDH	6 hours	
Digital switching techniques	2 hours	
Integrated services digital network: conditions, architecture, S/T and U interfaces, services, B-ISDN	4 hours	
Mobile networks – evolution, 2G and 3G networks architecture, multiple access, duplex, handover	4 hours	
LTE – performance, architecture, radio interface, mobility management, LTE-advanced, VoLTE	8 hours	

#### Bibliography<sup>9</sup>

1. J. Bellamy, Digital Telephony, Third Edition, John Wiley and Sons, 2000
2. W. Stallings, ISDN and Broadband ISDN with Frame Relay and ATM, Fourth Edition, Prentice Hall, 1999
3. M. Oteşteanu, F. Alexa, C. Balint, Telefonie numerică, Editura de Vest, Timişoara, 2004
4. Khasnabish, Bhumi. Implementing voice over IP. Hoboken: John Wiley & Sons: Wiley Interscience, 2003
5. Kartalopoulos, Stamatios V.. Next generation SONET/SDH : voice and data. Piscataway, NJ: IEEE Press; Hoboken, NJ: Wiley-Interscience, c2004
6. I. Glover and P. M. Grant, Digital Communications, 3-rd ed.: Prentice Hall, 2010.
7. Cox C., An introduction to LTE, 2nd ed., Wiley, 2014.

8.2 Applied activities <sup>10</sup>	No. of hours	Teaching methods
The Alcatel 1000E10 switching center—functional and hardware architecture	2 hours	exposure, simulation, case study, problem-solving, project methods, assessments every practical work
Using the console: instructions and the interrogation of the equipments	2 hours	
Multiprocessor stations: PCM terminals control station	2 hours	
Analog subscribers: subscriber line management, services, testing.	2 hours	

<sup>9</sup> 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.

<sup>10</sup> 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:”.

ISDN subscribers: the network interface, terminals, the subscriber line.	6 hours	
The CCITT no. 7 signaling system; Protocol analyzers	4 hours	
LTE: network architecture, laboratory equipment, connecting the terminals, cell reselection, handover	8 hours	
Bibliography <sup>11</sup>		
1. M. Oteșteanu, F. Alexa, C. Balint, Telefonie numerică, Editura de Vest, Timișoara, 2004		
2. ALCATEL/Alcatel-Lucent/Nokia Documentation		

**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**

•
---

**10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	Gaining knowledge related discipline, understanding technologies / methods presented	Written examination, 2 hours and 30 minutes	60 %
10.5 Applied activities	<b>S:</b>		
	<b>L:</b> level of familiarity with the various topics presented	Continuous assessment, written and oral examination	40 %
	<b>P:</b>		
	<b>Pr:</b>		
<b>10.6 Minimum performance standard</b> (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
<ul style="list-style-type: none"> <li>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</li> </ul>			

Date of completion

14.12.2016

Course coordinator  
(signature)

Coordinator of applied activities  
(signature)

<sup>11</sup> At least one title must belong to the staff teaching the discipline.

.....

.....

**Head of Department**  
**(signature)**

**Date of approval in the Faculty Council<sup>12</sup>**

**Dean**  
**(signature)**

.....

.....

---

<sup>12</sup> Avizarea este precedată de discutarea punctului de vedere al board-ului de care aparține programul de studiu cu privire la fișa disciplinei.