Syllabus

1. Data about the program of study

1.1 Institution	Technical University of Cluj-Napoca
1.2 Faculty	Automation and Computer Science
1.3 Department	Automation
1.4 Field of study	Systems Engineering
1.5 Cycle of study	Bachelor of Science
1.6 Program of study/Qualification	Automation and Applied Informatics (English)
1.7 Form of education	Full time
1.8 Codul disciplinei	43.00

2. Data about the subject

2.1 Subject name	*Data Transmission*					
2.2 Course responsible/lecturer	Prof. dr. ing. Adina Aștilean - Adina.Astilean@aut.utcluj.ro					
2.3 Teachers in charge of applications	Conf. dr. ing. Avram Camelia- Camelia.Avram@aut.utcluj.ro Asist.dr.ing. Radu Dan – Dan.Radu@aut.utcluj.ro Asist.dr.ing.Claudiu.Domuta – Claudiu.Domuta@aut.utcluj.ro					
2.4 Year of study	3	2.5 Semester	6	2.6 Assessment *(E/C/V)*		E
2.7 Type of subject	*DF – fundamental, DD – in the field, DS – specialty, DC – complementary*					DD
	DI – compulsory, DO – elective, Dfac – optional					DI

3. Estimated total time

3.1 Number of hours per week	4	of which:	Course	2	Seminar	Laboratory	2	Project
3.2 Number of hours per semester	56	of which:	Course	28	Seminar	Laboratory	28	Project

3.3 Individual study	
(a) Manual, lecture material and notes, bibliography	11
(b) Supplementary study in the library, online and in the field	3
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays	1
(d) Tutoring	1
(e) Exams and tests	3
(f) Other activities:	0

3.4 Total hours of individual study (sum of (3.3(a)…3.3(f)))	19
3.5 Total hours per semester (3.2+3.4)	75
3.6 Number of credit points	3

4. Pre-requisites (where appropriate)

4.1 Curriculum	System Theory
	Electronic Circuits
4.2 Competence	Computer Programming

5. Requirements (where appropriate)

6. Specific competences

6.1 Professional competences	Operating with basic concepts of information and communications technology

7. Course objectives

7.1 General objective	• Acquirement of basic knowledge for the design and implementation of communication systems integrated with monitoring and control structures

7.2 Specific objectives	• Knowing and understanding of basic principles, techniques, models and algorithms used in data communication networks • Acquirement of fundamental knowledge needed to design and implement data communication systems

8. Contents

8.1 Lecture	No.hours	Teaching methods	Notes
1. Introduction to digital communication systems	2h	Modern and traditional methods	
2. Signals: characteristics, attenuation and distortion sources, digital processing	2h		
3. Transmission media	2h		
4. Communication networks: architectures, protocols, reference models	4h		
5. Public switched telephone network (PSTN)	2h		
6. Satellite communications	2h		
7. Digital modulation	2h		
8. Channel coding	4h		
9. Data compression algorithms	2h		
10. Synchronous and asynchronous transmission	2h		
11. Industrial communication networks	2h		
12. Encryption algorithms	2h		

Bibliography
1. Tanenbaum, A., Computer Networks, Prentice Hall, 2010
2. Aștilean, A., Lecturer Notes
3. Introduction to Data Communication, Polytechnic Calgary, Alberta Canada, 2009
4. Stallings, W., Data and Computer Communications, Prentice Hall, 2016
5. Laboratory eHandbook, 2018

8.2 Applications (seminar/laboratory/project)	No.hours	Teaching methods	Notes
Transmission media	2h	Interactive methods, examples, practical applications	
Digital modulation	2h		
Baseband codes	2h		
Hamming code	2h		
Polynomial codes	2h		
Data compression	2h		
Android operating system- introduction	2h		
Design and implementation of Android based monitoring and control applications	6h		
Wireless control and monitoring systems	4h		
Data encryption methods	2h		
Final test	2h		

Bibliography
1. Tanenbaum, A., Computer Networks, Prentice Hall, 2010
2. Aștilean, A., Lecturer Notes
3. e-Laboratory Handbook, 2018
4. Introduction to Data Communication, Polytechnic Calgary, Alberta Canada, 2009
5. Stallings, W., Data and Computer Communications, Prentice Hall, 2016

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

The presented content is in accordance with actual orientations in the field

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	The capacity to use knowledge, creativity Correct utilization of techniques or means of expression specific to the field	Written Exam	80%
Laboratory	Choices consistent with the objective and with the intent developed The development of relevant skills	Methods of checking homework Assessment of laboratory work	10% 10%

N = 0.8E +0.2L
Minimum standard of performance: E>=5; L>=5

Date of filling in: 24.03.2023		Title Firstname NAME	Signature
	Course	Prof.dr.ing. Adina Astilean	
	Applications	Assoc.Prof. dr.ing. Camelia Avram Assistant Prof. dr.ing. Dan Radu Assistant Prof. dr.ing. Claudiu Domuta	

Date of approval by the Department Board	Head of Departament Prof.dr.ing. Honoriu VĂLEAN
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Date of approval by the Faculty Council	Dean Prof.dr.ing. Liviu Cristian MICLEA
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