



SYLLABUS

1. Data about the program of study

1.1 Institution	Technical University of Cluj-Napoca
1.2 Faculty	Faculty of Electronics, Telecommunications and Information
,	Technology
1.3 Department	Bases of Electronics
1.4 Field of study	Electronic Engineering, Telecommunications and Information
	Technologies
1.5 Cycle of study	Bachelor of Science
1.6 Program of study / Qualification	Telecommunications Technologies and Systems/ Engineer
1.0 Program of study / Qualification	Applied Electronics/Engineer
1.7 Form of education	Full time
1.8 Subject code	TST-E15.00/EA-E15.00

2. Data about the subject

2.1 Subject name		Introduction in Computer Aided Graphics					
Th		Theoretic	Theoretical area				
2.2 Subject area	Methodologic area						
Analys			area				
2.3 Course responsible/	lecture)	rer Assoc. Prof Mihaela CIRLUGEA, Ph.D., <u>Mihaela.Cirlugea@bel.utcluj.ro</u>			<u>luj.ro</u>		
2.4 Teachers in charge of	of	Assoc. Prof Mihaela CIRLUGEA, Ph.D., Mihaela.Cirlugea@bel.utcluj.ro			luj.ro		
applications							
2.5 Year of study II	2.6 S	emester	3	2.7 Assessment	V	2.8 Subject category	DF/DI

3. Estimated total time

3.1 Number of hours per week	Л	Of which: 3.2	2	3.3 seminary / laboratory	2
S.1 Number of hours per week		course			
2.4 Total hours in the surrisulum	EG	Of which: 3.5	28	3.6 seminary / laboratory	28
5.4 Total hours in the curriculum	50	course			
Time distribution					hours
Studying the manual, lecture material a	and n	otes, references			20
Supplementary study in the library, online and in the field					-
Preparation for seminars/laboratory works, homework, reports, portfolios, essays					16
Tutoring					4
Exams and tests					4
Other activities				-	
3.7 Total hours individual study		44			

3.8 Total hours per semester	100
3.9 Number of credit points	4

4. Pre-requisites (where appropriate)

4.1 Curriculum	Bases of electronic circuits	
1.2 Compotencies	Elements of electronic circuits, Matlab	
4.2 Competencies	Bases of programming	





5. Requirements (where appropriate)

5.1. for the course	Amphitheatre, Cluj-Napoca
5.2. for the applications	Laboratory, Cluj-Napoca

6. Specific competences

Professional competences	 C1. Use of the fundamental elements related to devices, circuits, systems, instrumentation and electronic technology C3. Application of the basic knowledge, concepts and methods regarding the architecture of computer systems, microprocessors, microcontrollers, languages and programming techniques C6. Solving specific problems of the broadband communications networks: propagation in different environment, circuits and equipment for high frequencies (microwaves and
Transversal	optical).
competences	N/A

7. Discipline objectives (as results from the key competences gained)

7.1 General objectives	Developing the competences regarding the use, analysis and design of electronic circuits and MatLab interfaces		
7.2 Specific objectives	 Recognizing and understanding basic concepts specific to fundamental mathematical calculus and representations in MatLab. Developing skills and abilities necessary for implementing in MAtLab electronic circuits. Developing skills and abilities for creating and implementing in MAtLab an active graphical user interface, applied on electronic circuits 		

8. Contents

8.1 Course	Teaching methods	Observations
1. Introduction in computer graphics		
2. Graphic design in electronic projects		
3. Electrical schemes. LTSpice environment		
4. Basic operations and data types in MatLab		
5. Electronic circuit modeling and simulation in Matlab.	Presentation, heuristic	
6. Matlab functions. Call. Parameters	conversation,	Use of .ppt presentation, projector, blackboard
7. Arithmetic operations. Vectors and matrices	exemplification, problem presentation, teaching exercise, case study, formative evaluation	
8. 2D and 3D graphical plots		
9. Graphical object generation and control		
10. Data representing. Interpolation and aproximation		
11. Data handles in MatLab		
12. Graphical user interfaces. Components		
13. Callback functions		
14. Creating and documenting a project		

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References					
1. LTSpice- Reference Guide					
2. MatWorks- tutorial lessons					
3. J.Attia- Electronics and Circuit Analysis Using Matlab					
4. S.Ghinea- Matlab					
5. Stephen Chapman_MatLab Programming for Enginee	ers, International student	edition, 2008,			
Stanford, USA					
6. Stephen Chapman, MatLab Programming for Enginee	ers, Cengage Learning, Sta	mnford, USA, 2016			
7. Scott Smith, MatLab Advanced GUI Development, DC	DG Ear Publishing, 2006				
www.bei.utcluj.ro/IGAC					
8.2 Laboratory	Teaching methods	Notes			
1. Introduction in Orcad.					
2. Editing of graphical elements					
3. Creating the electric schemes					
4. Creating electronic components in LtSpice					
5. Introduction in Matlab. Interface and utilities	-				
6. Using functions in Matlab					
7. Arithmetical operations in Matlab. Vectors and					
matrices					
8. Creating GUI					
9. 2D and 3D graphical plots					
10. Graphic objects. Creation and control					
11. Representing data					
12. Nummerical Integration of differential equations					
13. Electronic circuits modeling in GUI.					
14. Final test					
References					
1. LTSpice- Reference Guide					
2. MatWorks- tutorial lessons					
3. J.Attia- Electronics and Circuit Analysis Using Matlab					
4. S.Ghinea- Matlab					
5. Stephen Chapman_MatLab Programming for Enginee	ers, International student	edition, 2008,			
Stanford, USA					
 Stephen Chapman, MatLab Programming for Engineer Seett Smith, MatLab Advanced CUI Development, DC 	ers, Cengage Learning, Sta	mntord, USA, 2016			

 Scott Smith, MatLab Advanced GUI Development, DOG Ear Publishing, 2006 www.bel.utcluj.ro/IGAC

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

The discipline content and the acquired skills are in agreement with the expectations of the professional Competences acquired will be used in the following COR occupations (Electronics Engineer; Telecommunications Engineer; Electronics Design Engineer; System and Computer Design Engineer; Communications Design Engineer) or in the new occupations proposed to be included in COR (Sale Support Engineer; Multimedia Applications Developer; Network Engineer; Communications Systems Test Engineer; Project Manager; Traffic Engineer; Communications Systems Consultant).





10. Assessment

Activity type	10.1 Assessment criteria	10.2 Assessment	10.3 weight in		
Activity type	10.1 Assessment chtena	methods	the final grade		
10.4 Course	The level of acquired theoretical knowledge and practical skills	- Summative evaluation written verification (theory and problems)	20%		
10.5 Laboratory/Seminary	The level of acquired abilities	 Continuous formative evaluation practical lab test 	80%		
10.6 Minimum standard of performance					
$C \ge 5$ and $E \ge 5$ and $0,8L+0$),2C ≥ 5				

Data of filling in:	Responsible	Title First name SURNAME	Signature
16.06.2025	Course	Assoc. Prof Mihaela CIRLUGEA, Ph.D.	
	Applications	Assoc. Prof Mihaela CIRLUGEA, Ph.D.	

Date of approval in the Council of the Communications Department 18.06.2025	Head of Communications Department Prof. Virgil DOBROTA, Ph.D.
Date of approval in the Council of the Faculty of Electronics, Telecommunications and Information Technology 25.06.2025	Dean Prof. Ovidiu POP, Ph.D.