

SYLLABUS

Discipline name	Introduction in Graphics on Computer Aided Design
Profile	Electronics and Telecommunications Engineering
Specialization	Telecommunications Technologies and Systems
Code	51321709
Course leader	Assistant Professor Mihaela Cirlugea, Ph.D – Mihaela.Cirlugea@bel.utcluj.ro
Collaborators	Assistant Lorant Szolga, Lorant.Szolga@bel.utcluj.ro
Department	Basis of Electronics
Faculty	Electronics, Telecommunications and Information Technology

Sem.	Type of discipline	Course	Applications			Course	Applications			Ind. study	TOTAL	Credits	Form of assessment
		[hours/week]			[hours/sem.]								
			S	L	P		S	L	P				
3	Fundamental	2	-	2	-	28	-	28	-	64	120	4	Exam

Acquired competences :

Acquired skills (what the student is able to do):

After completing the discipline, the students will be able to:

- Know and understand the editing of electronic devices symbols
- Know the data representation in 2D and 3D
- Know the implementation and simulation of the MatLAB methods of an electronic circuit
- Know the basic about Graphical User Interfaces in MatLAB

Acquired abilities: (what type of equipment/instruments/software the student is able to handle)

After completing the discipline, the students will be able to:

- edit electronic devices symbols in OrCAD
- represent data in 2D and 3D in MatLAB
- implement and simulate the MatLAB methods of an electronic circuit
- implement Graphical User Interfaces using MatLAB

Prerequisites (if necessary)

passive electronic components and circuits

A. Course/Lecture (course/lecture titles)

1	Introduction in Computer Aided Graphics
2	Graphical Elements in Electronic Projects
3	Electric Schemes. The OrCAD Program
4	Electronic Devices. Symbols
5	Introduction into the MatLAB Program
6	MatLAB Functions. Call. Parameters
7	Arithmetic Operations. Vectors and Matrices Generation
8	GUI Creation
9	2D and 3D Graphical Interfaces
10	Graphical Figures and Objects. Creation and Control
11	Data Approximation and Representation
12	Numerical Integration
13	Electronic Circuits Modelling and Simulation
14	Project Documentation Stages

B1. Applications – Laboratory (list of laboratories), Seminar (contents), Project (project contents)

1	Laboratory Presentation
2	Graphical Elements Editing in OrCAD
3	Electrical Schemes in OrCAD
4	Electronic Devices Symbol Editing in OrCAD
5	Introduction in MatLAB
6	MatLAB Functions
7	Arithmetic Operations. Vectors and Matrices Generation
8	GUI Creation
9	2D and 3D Graphical Interfaces in MatLAB
10	Graphical Figures and Objects. Creation and Control

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11	Data Approximation and Representation
12	Numerical Integration
13	Electronic Circuits Modelling and Simulation
14	Final Verification

C. Individual study (reference study contents, synthesis materials, projects, applications etc.)

2 synthesis reports
 12 sets of problems (the preparation part in every laboratory)
 4 sets of problems (course homework)

Individual study structure	Course study	Problem solving, laboratory, project	Applications preparation	Examination time	Additional reference study	Total no. of individual study hours
Hours	28	6	18	3	9	64

References (Textbooks, courses, laboratory manual, exercise book)

1. M. Cîrlugea: Notes on Computer Graphics in Electronics, Course and exercises
2. J.Attia: Electronics and Circuit Analysis Using Matlab (Department's library)
3. T. Fjeldly, T. Ytterdal, M. Shur : Introduction to Device Modelling and Circuit Simulation, John Wiley & Sons, New York, 1997
4. Orcad- Reference Guide

On – line references

1. laboratory manual: www.bel.utcluj.ro/IGAC
2. www.cadence.com
3. www.mathworks.com
4. iguanalab.com

Final evaluation

Evaluation method	Colloquium (C): laboratory project (80%) and written project (20%).
Mark components	Laboratory project (LP: 0...7 points); Written project (WP: 0...2 points); Homework (H: 0...1 points);
Mark computation	$M = 0.7LP + 0.2WP + 0.1H$. Pass if: $LP \geq 4$ and $WP \geq 0.5$ and $H \geq 0.5$

Course leader,

Assist. Prof. Mihaela CÎRLUGEA, Ph.D.