COURSE GUIDE
2019-2020

Dean,
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1. Program info

1.1 Higher education institution	"Gheorghe Asachi" Technical University of Iaşi
1.2 Faculty / Department	Electronics, Telecommunications and Information Technology
1.3 Department	Fundamentals of Electronics
1.4 Field	Electronics, Telecommunications Engineering and InformationTechnology
1.5 Study level	Bachelor
1.6 Study program / Qualification	Telecommunication Systems and Techologies

2. Course info

2.1 Course name **Passive Components and Circuits**						Code:**EDID 106**	
2.2 Course organizer (lecturer)		PhD Lecturer Liviu Ţigăeru					
2.3 Teaching assistants		PhD Lecturer Liviu Ţigăeru					
2.4 Year of study	1	2.5 Semester	2	2.6 Assessement	Exam	2.7 Category	DID

3. Estimated total time (hours per semester for teaching activities)

3.1 Number of hours per week	4	3.2 lecture	2	3.3 seminar/laboratory	2
3.4 Total number of hours in curricula	56	3.5 lecture	28	3.6 seminar/laboratory	28
Time distribution					hours
Textbook, course support, references and course notes study					18
Library, electronic platforms and on site documentation					18
Seminar/laboratory preparation, homework, reports, portfolios and essays					18
Tutoring					7
Assessment					3
Other activities					

3.7 Total individual study hours	64
3.9 Total hours per semester	120
3. 10 Number of credit points	5

4. Prerequisites (where applicable)

4.1 curricula type	
4.2 competence type	

5. Infrestructure (where applicable)

5.1. for lectures	Videoprojector
5.2. for laboratories	Electronic equipments, computer network

6. Specific competences

Professional competences	• Cognitive skills: the students will achieve the basic knowledge of the electronic materials structure, of the fundamental characteristics of the passive components, analysis and design of the passive electronic circuits respectively. Technical or professional skills: the students will learn the basic elements of the electronic equipments structure and operation, how to measure the fundamental characteristics and parameters of the electronic circuits.
Transversal competences	• To learn to use English references. • To learn the team work.

7. Course targets (as resulting from 6. Specific competences table)

7.1 Course main target	To develop theoretical and practical abilities required to analyse and design fundamental electronic passive circuits; to achieve the fundamental knowledges of electronic materials fabrication and utilisation.
7.2 Course specific targets	The students will achieve the basic knowledge of the electronic materials structure, of the fundamental characteristics of the passive components, analysis and design of the passive electronic circuits respectively. Technical or professional skills: the students will learn the basic elements of the electronic equipments structure and operation, how to measure the fundamental characteristics and parameters of the electronic circuits.

8. Contents

8. 1 Lectures	Teaching methods	Notes
Part I: Passive electronic components: 1. Resistor: structure, conductors, equations, parameters. 2. Inductor: structure, magnetic materials, equations, parameters. 3. Capacitor: structure, dielectric materials, equations, parameters. **Part II. The behaviour of the real passive electronic components in high frequency domain** 4. The behavior of the ideal passive electronic components in sinusoidal steady state regime 5. The behavior of the real resistor in the sinusoidal steady state regime: the equivalent circuit of the real resistor, the parasitic elelements, the electrical admitance of the real resistor, the behavior of the real resistor in high frequency domain, the resonance of the real resistor, the quality factor of the real resistor 6. The behavior of the real inductor in the sinusoidal steady state regime: the equivalent circuit of the real inductor, the parasitic elelements, the electrical admitance of the real inductor, the behavior of the real inductor in high frequency domain, the resonance of the real inductor, the quality factor of the real inductor 7. The behavior of the real capacitor in the sinusoidal steady state regime: the equivalent circuit of the real capacitor, the parasitic elelements, the electrical impedance of the real capacitor, the behavior of the real capacitor in high frequency domain, the resonance of the real capacitor, the dissipation factor	Oral presentation at the blackboard and videoprojector. The teaching material is discussed with the students during the class hours. The topics are presented in detail in the references.	• 1 = 4 hours • 2 = 4 hours • 3 = 4 hours • 4 = 2 hours • 5 = 2 hours • 6 = 2 hours • 7 = 2 hours • 8 = 2 hours • 9 = 1 hours • 10 = 1 hours • 11 = 2 hours • 12 = 2 hours

of the real capacitor **Part III. Passive electronic circuits** 8. The equivalent impedance between two arbitrary points 9. The response of the passive electronic circuits in sinusoidal steady state regime 10. Voltage divider/ current divider 11. Passive filters 12. Resonant circuits		

References

1. http:www.etti.tuiasi.ro/ platforma Moodle
2. Orita C., Derevlean M., Componente si Circuite pasive, Editura Gh Asachi, Iasi, 1999
3. Sinclair I., Passive Components for Circuit Design, Springer, 2000
4. Boylestad D. Introductory Circuit Analysis, Prentice Hall, 10th ed. 2008
5. Robbins, Myler, Circuit Analysis. Theory and Practice, McGraw, 2nd ed. 2006
6. Nilsson J., Riedel S., Electric Circuits, Prentice Hall, 2008
7. Bird J. Electrical Circuit Theory and Technology, Newnes, 2003

8. 2 Laboratory	**Teaching methods**	**Notes**
1. Laboratory rules. The representation of the electrical information. 2. RLC bridge HM8018 3. The measurement of the impedance parameters with HM8018 bridge 4. The resistor 5. The inductor 6. The capacitor 7. Transient regime of RC/RL circuits 8. HM303 oscilloscope; HM 8030 signal generator. 9. The study of the resistive divider 10. RL voltage filter 11. RC voltage filter 12. Wien bridge 13. Labs recovery 14. Laboratory test		- each laboratory spans 2 hours - week 13 is dedicated to the recovering of at most 2 lost labs.

References:

1. http:www.etti.tuiasi.ro/ Moodle platform
2. Orita C., Derevlean M., Componente si Circuite pasive, Editura Gh Asachi, Iasi, 1999
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7. Bird J. Electrical Circuit Theory and Technology, Newnes, 2003

9. Course contents corroboration with the expectations of the epistemic community representatives, professional associations and relevant employers in the field of the program

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10. Assessment

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Percentage of final grade
10.4 Lectures	- The correctness of the acquired knowledge. - Logical choerence.	Semestrial tests: 1 written test, Final assesment: written test: theoretical questions and applications; 3-5 subjects, depending on the complexity	60%
10.5 Seminar/laboratory	The capacity to operate with the acquired knowledge.	• Weekly lab. reports: • Practical demonstrations.	40%
10.6 Minimum performance standard			

The fundamental knowledge about the electronic components and passive circuits. At least 5 grade at exam: exam grade 0,4 x test grade + 0,6 x final assesment At least 5 grade at laboratory assesment.

Completion date
10.09.2019

Course organizer signature,

Teaching assistant signature,

Department approval date

Department director signature
Prof. Dr. Ing. Victor Grigoras