FISA DISCIPLINEI

Denumirea disciplinei	Theory of electric circuits
Domeniul de studiu	
Specializarea	
Codul disciplinei	51381407
Titularul disciplinei	Prof.dr.ing. Radu V. CIUPA
Colaboratori	Asist.ing. Denisa DUMA, Denisa.Duma@et.utcluj.ro
Catedra	Electrotehnica
Facultatea	Inginerie electrica

Sem.	Tipul disciplinei	Curs	Aplicații			Curs	Aplicații			Stud. Ind.	TOTAL	Credit	Forma de verificare
		[ore/săpt.]				[ore/sem.]							
			S	L	P		S	L	P				
9	**Ing. din domeniu**	**2**	**2**	**-**	**-**	**28**	**28**	**-**	**-**	**30**	**86**		**Examen**

Competențe dobândite:
Knowledge / understanding:
• To enable the student to solve various types of theoretical problems using methods and theorems • To enable the student to analyse and study electronic circuits by means of quadripoles. • To convince students that their understanding of many areas, such as solid state, physical electronics, microwaves, etc. depends on EM
Intellectual skills:
• This course should stimulate students' interest, for they often tend to view a course in EM as a dry experience which does not go beyond mathematical manipulations.
Practical skills:
• The more logical presentation of the traditional approach can be made sufficiently exciting to engineering students by relating the theory to real-world problems which are covered in the application sections

Pre-requisites:
Mathematics I, II; Physics

A. Course content:	
1	Introduction to the circuit theory.
2	Direct current circuits (Kirchhoff theorems, ideal sources, node analysis, loop analysis, Thevenin and Norton equivalent generator)
3	Linear electric circuits in the sinusoidal steady state.
4	Symbolic representation of sinusoidal quantities, linear complex electric circuits equations
5	Equivalent impedances
6	Power, conservation of complex power, energy transfer
7	Resonance in electric circuits (series, parallel, real, inductively coupled circuits)
8	Methods and theorems for the analysis of the a.c. circuits (elements of topology and graph theory, transfiguration methods).
9	Two-port networks (physical significance of the parameters, connections, equations, equivalent diagrams)
10	Three-phased electric circuits
11	Non-sinusoidal steady state
12	The transient regime of the linear electric circuits (continuity conditions, first order circuits, second order circuits).
13	The transient regime of the linear electric circuits (Laplace transform, Fourier transform, state equations).
14	Transmission lines

B1. Applications (lista lucrări, teme de seminar, conținutul proiectului de an)	
1	Basic knowledge about electric circuits
2	Methods -direct current circuits
3	Linear electric circuits in the sinusoidal steady state.
4	Symbolic representation of sinusoidal quantities
5	Equivalent impedances 1
6	Equivalent impedances 2
7	Resonance in electric circuits (series, parallel)
8	Resonance in electric circuits (real, inductively coupled circuits)
9	Methods and theorems for the analysis of the a.c. circuits 1

10	Methods and theorems for the analysis of the a.c. circuits 2
11	Methods and theorems for the analysis of the a.c. circuits 3
12	Non-sinusoidal regime
13	The transient regime of the linear electric circuits 1
14	The transient regime of the linear electric circuits 2

B2. Sala laborator (Sala/suprafata, adresa) B 204/50 m^2 , C 05/50 m^2 B-dul Muncii 103-105

Echipament	Descriere echipament	Anul achizitiei
Aparatură de măsură de înaltă precizie, fabricație HAMEG	- 2 x Sursa tripla de tensiune HM 8040 - 5 x Multimetru digital HM 8011 - 3 x Generator functii HM 8030 +cablu coaxial cu mufa BNC HZ 34 - 6 x Mainframe (suport cu alimentare module)HM 8001- - 1 x LC metru HM 8018 - 1 x Caracterograf HM 8042 - 2 x Osciloscop digital HM 407, 2x40 MHz - 5x Osciloscop digital HM 303-6, 2x35 MHz - 1 x Analizor spectral HM 5014 - 1 x Analizor spectral HM 5012 - 1 x Nearfield probe toolkit (masura E si H) HZ 530 - 1 x LISN (impedanta artificiala retea) HM 6050 - 1 x Generator functii programabil HM 8131 - 1 x Generator RF HM 8134 - 1 x Sursa tripla de tensiune programabila HM 8142 - 1 x Frecventmetru progamabil HM 8122 - 8 x Multimetru digital portabil HC 81 -2 x Interfata IEEE 488 HO 80 - 2 x Cablu interfata IEEE HZ 72 - 10 x Sistem modular de masura, de laborator, rack HM 8001	2007
Multimetre de precizie METRAHIT	Masurare curenti, tensiuni si rezistente in curent alternativ si continuu	2003
Aparatură masură putere MAVOWATT4	Masurare putere activa (puteri mari) 5 x Wattmetru portabil	2006
Aparate de masura	Ampermetre, voltmetre, watt,metre 10 x Sistem modular de masura, de laborator, rack HM 8001	2007

C. Studiul individual (tematica studiilor bibliografice, materiale de sinteză, proiecte, aplicații etc.)

1. Various types of theoretical problems using methods and theorems (material de sinteză)

Structura studiului individual	Studiu materiale curs	Rezolvări teme, lab., proiecte	Pregătire aplicații	Timp alocat examinărilor	Studiu bibliografic suplimentar	Total ore pregătire individuală
Nr. ore	14	7	7	2	14	44

D. Aims

- to provide a grounding in the electrical circuits theory
- to present the fundamental notions necessary in the study of an a.c. circuit

References (Cursuri, indrumatoare de lucrari, proiect, culegeri de probleme)

1. The Theory of Electric Circuits, authors: RV Ciupa, V Topa, Casa Cartii de Stiinta Publishing House, 2003

Assessment	
Modul de examinare	1. Two hours written examination (70%); 2. Continuous assessment: a) seminar (30%)
Componentele notei	Examen (nota E); Seminar (nota S);
Formula de calcul a notei	N=0,7E+0,3S Condiția de obținere a creditelor: N≥5; S≥5;

Responsabil disciplina
Prof.dr.ing. Radu V. CIUPA