SYLLABUS[1]

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[2] / Department[3]	Faculty of Electronics and Telecommunications Engineering/ Fundametal of Physics for Engineers
1.3 Chair	—
1.4 Field of study (name/code[4])	Electronics and Telecommunications
1.5 Study cycle	Licence
1.6 Study program (name/code)/Qualification	Electronics and Telecommunications/ Engineer

2. Information about the discipline

2.1 Name of discipline			Electric Circuits				
2.2 Coordinator (holder) of course activities			Conf.dr.ing. Marian GRECONICI				
2.3 Coordinator (holder) of applied activities [5]			S.l.dr.ing. Constantin BLAJ				
2.4 Year of study[6]	I	**2.5** Semester	I	**2.6** Type of evaluation	E	**2.7** Type of discipline	mandatory

3. Total estimated time (hours / semester of didactic activities)

3.1 No. of hrs. / week	4 , of which:	**3.2** course	2	**3.3** seminar/laboratory/ project/training	2
3.4 Total no. of hrs. in the education curricula	56 , of which:	**3.5** course	28	**3.6** applied activities	28

3.7 Distribution of time for individual activities related to the discipline	hrs.
Study using a manual, course materials, bibliography and lecture notes	20
Additional documentation in the library, on specialized electronic platforms and on the field	8
Preparation for seminars / laboratories, homeworks, assignments, portfolios, and essays	16
Tutoring	10
Examinations	3
Other activities	
Total hrs. of individual activities	57

3.8 Total hrs. / semester[7]	113
3.9 No. of credits	5

4. Prerequisites (where applicable)

4.1 Curriculum	• Mathematical analysis, Linear Algebra and Geometry, Physics, Programming
4.2 Competencies	• Algebraic calculus, Vectors calculus, Integral and differential calculus; Basics of Physics and programming

5. Conditions (where applicable)

5.1 of the course	• Course room, beamer, blackboard
5.2 to conduct practical activities	• Seminar room, blackboard, computers/ Laboratory with specific devices for electric

[1] The form corresponds to the Syllabus promoted by OMECTS 5703/18.12.2011 (Annex3).
[2] The name of the faculty which manages the educational curriculum to which the discipline belongs.
[3] The name of the department entrusted with the discipline, and to which the course coordinator / holder belongs.
[4] Fill in the code provided in GD no. 493/17.07.2013.
[5] The applied activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[6] The year of study to which the discipline is provided in the curriculum.
[7] It is obtained by summing up the number of hrs. from 3.4 and 3.7.

	circuits works, sources, measurement instruments, computers with specific software, blackboard.

6. Specific competencies acquired

Professional competencies[8]	• Using the fundamental elements concerning with the devices, circuits, systems, instrumentation and electronic technology
Transversal competencies	• Responsible, etic and honorable behavior within the low in order to ensure the reputation of the profession

7. Objectives of the discipline (based on the grid of specific competencies acquired)

7.1 General objective of the discipline	• Introduction of the scientific fundamentals in the domain of electrical engineering and applications
7.2 Specific objectives	• Obtaining fundamental knowledge in the field of electric materials, electric circuits and electromagnetic field. • Obtaining basic knowledge for further understanding of the next specific courses

8. Content

8.1 Course	No. of hours	Teaching methods
Introduction 1.1. Fundamental electrical quantities （electric power and energy, electric charge and current, electric potential and voltage） 1.2. Basic circuit concepts 1.3. Active circuit elements (independent voltage and current sources, controlled sources) 1.4. Passive circuit elements (resistance, capacitance, inductance)	4	Lecture, explanations, examples, conversations, advices
2**. Direct current (DC) steady state circuit analysis** 2.1. The Kirchhoff's Laws (KL) 2.2. Power in DC circuits 2.3. Source transformation 2.4. Linearity and superposition 2.5. Source transportation 2.6. Thevenin's and Norton's equivalence 2.7. Nodal and mesh analysis 2.8. Maximum power transfer theorem	9	Lecture, explanations, examples, conversations, advices
3**. Sinusoidal (AC) steady state circuit analysis** 3.1. Some general definitions (instantaneous value, rms value, angular velocity, frequency, period, etc.) 3.2. Single-elements responses to sinusoidal excitations; RLC series circuit supplied with a sinusoidal voltage	8	Lecture, explanations, examples, conversations, advices

[8] The professional competencies and the transversal competencies will be treated according to the Methodology of OMECTS 5703/18.12.2011. The competencies listed in the National Register of Qualifications in Higher Education [Registrul Național al Calificărilor din Învățământul Superior RNCIS] (http://www.rncis.ro/portal/page?_pageid=117,70218&_dad=portal&_schema=PORTAL) will be used for the field of study from 1.4 and the program of study from 1.6 of this form, involving the discipline.

3.3. The Kirchhoff's laws for AC circuits 3.4. The phasor method; symbolic representation and defining relations used in the phasor method 3.5. The phasor form of the Kirchhoff's laws 3.6. Power in AC steady states circuits 3.7. Power factor and power compensation 3.8. Maximum power transfer theorem for AC circuits		
4. **Fourier analysis** 4.1. Some general definitions (rms value, THD factor, etc.) 4.2. Method to solve circuits with a periodical excitation 4.3. Power in circuit with periodic excitation	3	Lecture, explanations, examples, conversations, advices
5. **First order transient analysis** 5.1. Introduction in transient analysis 5.2. The classical method of transient analysis 5.3. General method for solving all 1st order RL and RC circuits 5.4. Example that use the transient analysis	4	Lecture, explanations, examples, conversations, advices

Bibliography[9] 1. A. E. Fitzgerald, D. E. Higgibotham, A. Grabel, *Basic Electrical Engineering*, McGraw-Hill; fifth edition, 1981
2. Charles K. Alexander, Matthew N. O. Sadiku, *Fundamentals of Electric Circuits*, McGraw-Hill; fourth edition, 2009
3. Mahmood Nahvi, Joseph A. Edminister, *Electric Circuits*, Schaum's Outline Series, McGraw-Hill, 2003
4. M. Greconici, *Electric Circuits. Notes of course*, http://www.et.upt.ro
5. Tonz R. Kuphaldt, Fundamentals of Electrical Engineering and Electronics, Virtual Institut of Applied Sciense, (VIAS), 2006

8.2 Applied activities[10]	No. of hours	Teaching methods
Experiments on simple DC circuits	8	
Experiments on simple AC circuits	8	
Low pass and high pass RC circuits	4	
PSpice simulation of electrical circuits	8	

Bibliography[11] 1. M. Greconici, *Electric Circuits. Experiments*, http://www.et.upt.ro

[9] At least one title must belong to the department staff teaching the discipline, and at least 3 titles must refer to national and international works relevant for the discipline, and which can be found in the Politehnica University Library.
[10] The types of applied activities are those specified in footnote 5. If the discipline contains several types of applied activities, then these will be written consecutively in the lines of the table below. The type of activity will be written in a distinct line, as „Seminar:", „Laboratory:", „Project:" and/or „Practice/Training:".
[11] At least one title must belong to the staff teaching the discipline.

9. Corroboration of the content of the discipline with the expectations of the main representatives of the epistemic community, professional associations and employers in the field afferent to the program

- Electric Circuits knowledge represents a background and is useful to the further understandings of the disciplines from the electronics and telecommunications curricula.
- The basics of electric circuits are also useful to solve complex technical projects.

10. Evaluation

Type of activity	**10.1** Evaluation criteria	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	Solving 6 circuit problems: 2 problems of DC circuits, 2 AC circuit problems, 1 problem using Fourier analysis and 1 problem of transient	Written test	66 %
10.5 Applied activities	**S:**		
	L: Theoretical knowledge, experimental ability, data processing and result interpretation, solving the additional proposed works	Verification tests, answer to the questions, homework evaluation	33 %
	P:		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified)			
• Knowledge of fundamental elements of electric circuits (DC, AC, Fourier ant transient fundamental knowledge)			

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
	.....	.....
Head of Department (signature)	**Date of approval in the Faculty Council[12]**	**Dean (signature)**
.....		.....

[12] Avizarea este precedată de discutarea punctului de vedere al board-ului de care aparţine programul de studiu cu privire la fişa disciplinei.