SYLLABUS

1. Information about the program

1.1 Higher education institution	Politehnica University Timisoara
1.2 Faculty[1]/ Department [2]	Chemical Engineering, Biotechnologies and Environmental Protection / BFI
1.3 Field of study (name/code[3])	Chemical Engineering / 10.30.50
1.4 Study cycle	License
1.5 Study program (name/code/qualification)	Chemical Engineering / 10.30.50.60 / engineer

2. Information about the discipline

2.1 Name of discipline/ formative category[4]			Electrotechnics and Electronics / DD				
2.2 Coordinator (holder) of course activities			Lecturer dr.eng. Simona ILIE				
2.3 Coordinator (holder) of applied activities[5]			Lecturer dr.eng. Simona ILIE				
2.4 Year of study[6]	II	**2.5** Semester	3	**2.6** Type of evaluation	D	**2.7** Regime of discipline[7]	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted) [8]

3.1 Number of fully assisted hours / week	3 of which:	**3.2** course	2	**3.3** seminar / laboratory / project	0/1/0
3.1* Total number of fully assisted hours / semester	42 of which:	**3.2*** course	28	**3.3*** seminar / laboratory / project	0/14/0
3.4 Number of hours partially assisted / week	2 of which:	**3.5** training	1	**3.6** hours for diploma project elaboration	1
3.4* Total number of hours partially assisted / semester	28 of which:	**3.5*** training	14	**3.6*** hours for diploma project elaboration	14
3.7 Number of hours of unassisted activities / week	2.35 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			0.5
		hours of individual study after manual, course support, bibliography and notes			1
		training seminars / laboratories, homework and papers, portfolios and essays			0.85
3.7* Number of hours of unassisted activities / semester	33 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			7
		hours of individual study after manual, course support, bibliography and notes			14
		training seminars / laboratories, homework and papers, portfolios and essays			12
3.8 Total hours / week [9]	5.35				
3.8* Total hours /semester	75				
3.9 Number of credits	3				

4. **Prerequisites** (where applicable)

4.1 Curriculum	•
4.2 Competencies	•

[1] The name of the faculty which manages the educational curriculum to which the discipline belongs
[2] The name of the department entrusted with the discipline, and to which the course coordinator/holder belongs.
[3] The code provided in HG - on the approval of the Nomenclature of fields and specializations / study programs, annually updated.
[4] Discipline falls under the educational curriculum in one of the following formative disciplines: Basic Discipline (DF), Domain Discipline (DD), Specialist Discipline (DS) or Complementary Discipline (DC).
[5] Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).
[6] Year of studies in which the discipline is provided in the curriculum.
[7] Discipline may have one of the following regimes: imposed discipline (DI) or compulsory discipline (DOb)-for the other fundamental fields of studies offered by UPT, optional discipline (DO) or optional discipline (Df).
[8] The number of hours in the headings 3.1 *, 3.2 *, ..., 3.8 * is obtained by multiplying by 14 (weeks) the number of hours in headings 3.1, 3.2, ..., 3.8. The information in sections 3.1, 3.4 and 3.7 is the verification keys used by ARACIS as: (3.1) + (3.4) ≥ 28 hours / wk. and (3.8) ≤ 40 hours / wk.
[9] The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

5. **Conditions** (where applicable)

5.1 of the course	•
5.2 to conduct practical activities	•

6. **Specific competencies** acquired through this discipline

Specific competencies	• Performing calculations, demonstrations and applications to solve specific engineering tasks based on knowledge from engineering sciences. • Development and interpretation of specific technical documentation.
Professional competencies ascribed to the specific competencies	• - Analyse production processes for improvement; • - Manage chemical testing procedures; • - Test materials; • - Write technical reports • -Performs chemical experiments • -Approve engineering design • -Assess environmental impact

Transversal competencies ascribed to the specific competencies

- - Conduct quality control;
- - Apply scientific, technological and engineering knowledge;
- - Uses equipment, instruments or technological equipment accurately.

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7. **Objectives of the discipline** (based on the grid of specific competencies acquired - pct.6)

7.1 The general objective of the discipline	• Unitary and coherent introduction of electrical, electrotehnical and electronic engineering concepts. • Knowledge of domain-specific physical quantities, their relationships and calculation methods.
7.2 Specific objectives	• Training and development of practical skills necessary for determining and interpreting experimental results in the field of electrical and electronic engineering.

8. **Content** [10]

8.1 Course	Number of hours	Teaching methods [11]
Electric field. Electric charge and electric field strength. Electrical voltage. Electrical polarization. Laws. Electric field in conductors and dielectrics. Technical applications	3	Talks, power point presentation, whiteboard demonstrations
Electrokinetic field. Electric current and current density. Laws. Applications	1	
Magnetic field. Magnetic induction, magnetic field strength and magnetization. Laws. Magnetic materials.	2	

[10] It details all the didactic activities foreseen in the curriculum (lectures and seminar themes, the list of laboratory works, the content of the stages of project preparation, the theme of each practice stage). The titles of the laboratory work carried out on the stands shall be accompanied by the notation "(*)".

[11] Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

Electromagnetic field. The law of magnetic circuit and the law of electromagnetic induction.	2	
General notions about electrical circuits. The ideal circuit elements	2	
DC electrical circuits. Kirchhoff's theorems. Calculation of linear and nonlinear electrical circuits	4	
Linear electrical circuits in sinusoidal regime. Single phase circuits. Three-phase circuits	4	
Simple electrical circuits in transient regime. RL circuit. RC circuit	2	
Electric cars. Electrical transformer. Three-phase and single-phase asynchronous motor	2	
Semiconductor electronic devices. Diode, transistor, thyristor	2	
Recovery of alternating current. Recovery schemes	3	

Bibliography [12] 1. Bere I. Electrical engineering. Orizonturi Universitare Publishing, Timişoara, 1998.
2. Șora C., De Sabata I., Bogoevici N., Heler A., Daba D., Vetreș I., Radu D., Toader D., Hărăguş Ş., Bere I., Titihăzan M., Irimia D., Bărbulescu E., Blaj C., Greconici M., Basics of electrotechnics. Theory and applications. Politehnica Publishing, Timisoara, 2008.
3. Toader D. Electrical engineering. Theory and applications. Mirton Publishing, Timişoara, 1997.
4. Greconici M., Electric Circuits. DC&AC Steady State. Politehnica Publishing, Timișoara, 2020
5. I. Tatai, S. Ilie – Analysis of electrical circuits. Problems. Politehnica Publishing, Timișoara, 2022.

8.2 Applied activities [13]	Number of hours	Teaching methods
Laboratory-specific labor protection rules. Electrical appliances and circuit elements	2	oral exposure
Simple DC circuits. Theorems applied in DC circuits	2	
Linear electrical circuits in sinusoidal regime	2	
Star connection of three-phase electrical circuits	2	
Experimental study of the laws of interdependence between electric field and magnetic field	2	oral exposure
Transient charge and discharge regime of capacitor	2	oral exposure
Semiconductor diode. Single phase recovery schemes	2	oral exposure

Bibliography [14] 1. Ildiko Tatai, Daniela Vesa, Fundamentals of electrical and electronic engineering. Practical works and numerical simulations, Orizonturi Universitare Publishing, Timisoara, 2015.

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

- Knowledge of Electrical Engineering and Electronics is necessary to understand some subjects from the curriculum, taught later.
- The applications of Electrotechnics are generally widespread, this knowledge allows broadening the technical horizon and leads to useful skills in everyday life, leading to skills necessary to collaborate with other specialists, for the complete solution of multidisciplinary projects

10. Evaluation

Type of activity	**10.1** Evaluation criteria [15]	**10.2** Evaluation methods	**10.3** Share of the final grade
10.4 Course	• Knowledge of Electrical Engineering and Electronics is necessary to understand	Distributed exam	2/3

[12] At least one title must belong to the discipline team and at least one title should refer to a reference work for discipline, national and international circulation, existing in the UPT library.
[13] Types of application activities are those specified in footnote 5. If the discipline contains several types of applicative activities then they are sequentially in the lines of the table below. The type of activity will be in a distinct line as: "Seminar:", "Laboratory:", "Project:" and / or "Practice/training".
[14] At least one title must belong to the discipline team.
[15] Syllabus must contain the procedure for assessing the discipline, specifying the criteria, methods and forms of assessment, as well as specifying the weightings assigned to them in the final grade. The evaluation criteria shall be formulated separately for each activity foreseen in the curriculum (course, seminar, laboratory, project). They will also refer to the forms of verification (homework, papers, etc.)

	some subjects from the curriculum, taught later. • The applications of Electrotechnics are generally widespread, this knowledge allows broadening the technical horizon and leads to useful skills in everyday life, leading to skills necessary to collaborate with other specialists, for the complete solution of complex, multidisciplinary projects		
10.5 Applied activities	**S:**		
	L: 1. Learning the issues taught in the course in a practical way. 2. The ability to make electrical circuits based on electrical diagrams 3. The ability to determine, process and interpret the results obtained experimentally	tests, projects	1/3
	P[16]**:**		
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified [17])			
• Correct answers to elementary questions resulting in the acquisition of fundamental knowledge in the field of electrical and electronic engineering, as well as solving certain sub points of the application part.			

Date of completion	**Course coordinator (signature)**	**Coordinator of applied activities (signature)**
		
Head of Department (signature)	**Date of approval in the Faculty Council** [18]	**Dean (signature)**
Conf.univ. dr. ing. Marian GRECONICI		Ș.L.dr.ing. Mircea Laurențiu DAN

[16] In the case where the project is not a distinct discipline, this section also specifies how the outcome of the project evaluation makes the admission of the student conditional on the final assessment within the discipline.
[17] It will not explain how the promotion mark is awarded.
[18] The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.