

SYLLABUS¹

THIS COURSE UNIT IS TAUGHT IN ROMANIAN LANGUAGE

1. Information about the program

1.1 Higher education institution	UNIVERSITY POLITEHNICA TIMIȘOARA
1.2 Faculty ² / Department ³	ELECTRICAL AND POWER ENGINEERING / ELECTRICAL ENGINEERING
1.3 Chair	—
1.4 Field of study (name/code ⁴)	ELECTRICAL ENGINEERING / 90
1.5 Study cycle	BACHELOR
1.6 Study program (name/code/qualification)	ELECTROTECHNICS / 30

2. Information about the discipline

2.1 Name of discipline/ formative category ⁵	INDUSTRIAL AND RESIDENTIAL ELECTRICAL INSTALLATIONS						
2.2 Coordinator (holder) of course activities	Assoc. Prof. Dr. Eng. Hedeș Alexandru						
2.3 Coordinator (holder) of applied activities ⁶	Assoc. Prof. Dr. Eng. Hedeș Alexandru						
2.4 Year of study ⁷	III	2.5 Semester	5	2.6 Type of evaluation	E	2.7 Type of discipline ⁸	DI

3. Total estimated time – hours / semester: direct teaching activities (fully assisted or partly assisted) and individual training activities (unassisted)⁹

3.1 Number of fully assisted hours / week	4 of which:	3.2 course	2	3.3 seminar / laboratory / project	0/1/1
3.1* Total number of fully assisted hours / semester	56 of which:	3.2* course	28	3.3* seminar / laboratory / project	28
3.4 Number of hours partially assisted / week	of which:	3.5 training		3.6 hours for diploma project elaboration	
3.4* Total number of hours partially assisted / semester	of which:	3.5* training		3.6* hours for diploma project elaboration	
3.7 Number of hours of unassisted activities / week	4 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			1
		hours of individual study after manual, course support, bibliography and notes			1
		training seminars / laboratories, homework and papers, portfolios and essays			2
3.7* Number of hours of unassisted activities / semester	56 of which:	additional documentary hours in the library, on the specialized electronic platforms and on the field			14
		hours of individual study after manual, course support, bibliography and notes			14
		training seminars / laboratories, homework and papers, portfolios and essays			28
3.8 Total hours / week ¹⁰	8				
3.8* Total hours /semester	112				
3.9 Number of credits	4				

4. Prerequisites (where applicable)

¹ The form corresponds to the Discipline File promoted by OMECTS 5703 / 18.12.2011 and to the requirements of the ARACIS Specific Standards valid from 01.10.2017.

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 The code provided in HG no.140 / 16.03.2017 or similar HGs updated annually shall be entered.

⁵ 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).

⁶ Application activities refer to: seminar (S) / laboratory (L) / project (P) / practice/training (Pr).

⁷ Year of studies in which the discipline is provided in the curriculum.

⁸ Discipline may have one of the following regimes: imposed discipline (DI), optional discipline (DO) or optional discipline (Df).

⁹ 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.

¹⁰ The total number of hours / week is obtained by summing up the number of hours in points 3.1, 3.4 and 3.7.

4.1 Curriculum	<ul style="list-style-type: none"> Physics, Electrotechnics, Measurement Techniques and Sensors, Automatic Control Technique, Electrical Apparata
4.2 Competencies	<ul style="list-style-type: none"> The ability of understanding the basic electrical engineering terms and to solve technical related problems

5. Conditions (where applicable)

5.1 of the course	<ul style="list-style-type: none"> video projector room
5.2 to conduct practical activities	<ul style="list-style-type: none"> video projector room, and specific equipment

6. Specific competencies acquired through this discipline

Specific competencies	<ul style="list-style-type: none">
Professional competencies ascribed to the specific competencies	<ul style="list-style-type: none"> CP1: The adequate application of basic knowledge of mathematics, physics, and chemistry in the electrical engineering domain; CP2: Performing basic knowledge of computer science and information technology; CP3: Operating with fundamental concepts of electrotechnics; CP4: The analysis, modeling and simulation of electrical systems; CP5: The use of measuring techniques of electrical and non-electrical quantities and of data acquisition systems in electrical systems; CP6: The design of automatic control systems.
Transversal competencies ascribed to the specific competencies	<ul style="list-style-type: none"> CT1: The identification of goals, available resources, necessary conditions of the achieved objectives, working stages and timing, deadlines and respective risks; CT2: Pluridisciplinary team tasks and responsibilities highlighting. Relating and efficient work techniques team application; CT3: Information sources, communication resources and computer aided professional education (web portals, domain specific software's, data-bases, on-line courses, etc) both in Romanian and in foreign language.

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

7.1 The general objective of the discipline	<ul style="list-style-type: none"> theoretical and practical initiation in the field of electrical installations
7.2 Specific objectives	<ul style="list-style-type: none"> training of the skills of technical-engineering application of knowledge in electrical installations; - familiarity with the operation of the basic concepts and concepts of electrical engineering; - initiation into the use of specific techniques of analysis, modelling and simulation in electrical engineering; • developing teamwork skills and efficient use of information sources and communication resources

8. Content ¹¹

8.1 Course	Number of hours	Teaching methods ¹²
1. GENERAL CHARACTERIZATION OF LOW VOLTAGE ELECTRICAL INSTALLATIONS (LVEI) 1.1. Terminology and notions specific to electrical installations 1.2. Panorama of the field of low voltage electrical installations	4	Use the video projector for teaching and the board for examples and numeric

¹¹ 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 "(*)".

¹² Presentation of the teaching methods will include the use of new technologies (e-mail, personalized web page, electronic resources etc.).

1.3. Standards and technical rules specific to electrical installations 1.4. General rules on the development of technical documentation in the field of electrical installations		applications. Teaching is done interactively, by challenging students to debate the subjects taught
2. LVEI SUPPLY AND CONFIGURATION 2.1. Connecting IEJT to the MT network; substations; sizing of the power transformer; 2.2. Schemes of JT distribution networks 2.3. Grounding schemes in JT networks 2.4. Protection against electric shock in IEJT	6	
3. COMPONENT ELEMENTS OF LVEI 3.1. Electrical protective apparatus 3.2. Electrical switching apparatus 3.3. Electrical control, signalling and measurement apparatus 3.4. Electrical conductors and cables 3.5. Electrical distribution boards 3.6. General rules on the use of electrical appliances in electrical distribution boards	6	
4. LVEI DESIGN 4.1. Design of LVEI designed for power supply 4.2. Design of LVEI for lighting and sockets 4.3. Sizing and checking the section of circuits and columns 4.4. Calculation of earth plugs in LVEI	6	
5. SPECIFIC LVEI PROBLEMS 5.1. Power factor compensation in LVEI 5.2. Harmonic reduction in the LVEI 5.3. Over voltage surge protection in LVEI	6	
Bibliography ¹³ 1. A. Hedes – <i>Course notes and applications</i> - in electronic format, made available to students (in Romanian); 2. Claudia Popescu, A. Hedes, O. Craiu, C. Mihalache, <i>Computer-assisted design in electrical engineering</i> , ASTR Publishing House, Bucharest, 2011, ISBN 978-606-8371-38-2 (in Romanian). 3. *** <i>Normative for the design, execution and operation of electrical installations related to buildings</i> , indicative I7-2011 (in Romanian). 4. P. Dinculescu, F. Sisak, <i>Electrical Installations and Equipment</i> . EDP, Bucharest, 1981 (in Romanian). 5. *** <i>Electrical installation guide – According to IEC international standards</i> . Schneider Electric, 2018. 6.*** <i>Consulting Application Guide – According to IEC Standards. Low Voltage Volume</i> . EATON, 2019.		
8.2 Applied activities ¹⁴	Number of hours	Teaching methods
1. Graphics and rules of schematic representation in electrical engineering	2	Video projector and writing board. Q&A
2. Getting computer-aided dimensioning and design of electrical installations.	6	
3. Power factor correction in low voltage electrical installations	2	
4. Practical experiments with electrical equipment and installations	4	

¹³ 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.

¹⁴ 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".

5. Project work: General Distribution Board – dimensioning and design	14	
Bibliography ¹⁵ 1. A. Hedes – <i>Course notes and applications</i> - in electronic format, made available to students (by group);		

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

- discipline ensures the initiation of students in electrical installations, by presenting the essential issues regarding the elaboration and use of documentation in electrical engineering, forming skills for the dimensioning and design of electrical installations

10. Evaluation

Type of activity	10.1 Evaluation criteria ¹⁶	10.2 Evaluation methods	10.3 Share of the final grade
10.4 Course	correct answers	written exam: 3-5 subjects, of which 2-3 theoretical and 1-2 numerical applications	50 %
10.5 Applied activities	S:		
	L: correctness of responses and abilities	laboratory reports and test to verify knowledge and practical skills	25 %
	P¹⁷: elaboration of a project on a specific theme	presentation and support of the project	25 %
	Pr:		
10.6 Minimum performance standard (minimum amount of knowledge necessary to pass the discipline and the way in which this knowledge is verified ¹⁸)			
<ul style="list-style-type: none"> resolution of at least 50% of the content of exam matters 			

Date of completion

02.12.2020

**Head of Department
(signature)**

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**Course coordinator
(signature)**

**Date of approval in the Faculty
Council ¹⁹**

**Coordinator of applied activities
(signature)**

**Dean
(signature)**

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¹⁵ At least one title must belong to the discipline team.

¹⁶ 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.)

¹⁷ 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.

¹⁸ It will not explain how the promotion mark is awarded.

¹⁹ The endorsement is preceded by the discussion of the board's view of the study program on the discipline record.