SYLLABUS

1. Data about the program of study

1.1	Institution	Technical University of Cluj-Napoca
1.2	Faculty	Faculty of Electrical Engineering
1.3	Department	Electric Power Systems
1.4	Field of study	Electrical Engineering
1.5	Cycle of study	Bachelor of Science
1.6	Program of study/ Qualification	Electrical System Cluj-Napoca in English language
1.7	Form of education	Full time
1.8	Subject code	22.2

2. Data about the subject

2.1	Subject name				Introduction in Electrical Engineering	
2.2	Course responsible/ lecturer				Sl.dr.ing. Cosmin DARAB	
2.3	Teachers in charge of Seminars/ Laboratory/ Project				Sl.dr.ing. Cosmin DARAB	
2.4 Year of study		2	2.5 Semester	1	2.6 Type of assessment *(E – exam, C – colloquium, V – verification)*	C
2.7 Subject category		*DF – fundamental, DD – in the field, DS – specialty, DC – complementary*				DS
		DI – compulsory, DO – elective, Dfac – optional				DO

3. Estimated total time

3.1 Number of hours per week:	3	of which	3.2 Course	2	3.3 Seminar		3.3 Laboratory	1	3.3 Project	
3.2 Total hours per semester	42	of which	3.5 Course	28	3.6 Seminar		3.6 Laboratory	14	3.6 Project	

3.7 Individual study:	
(a) Manual, lecture material and notes, bibliography	14
(b) Supplementary study in the library, online and in the field	6
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays	4
(d) Tutoring	4
(e) Exams and tests	2
(f) Other activities	3

3.8 Total hours of individual study *[sum (3.7(a) to 3.7(f))]*	33
3.9 Total hours per semester *[sum of 3.4 and 3.8]*	75
3.10 Number of credit points	3

4. Prerequisites (where applicable)

4.1	Curriculum	No
4.2	Competences	Basic PC operation, Microsoft Office, AutoCAD

5. Requirements (where appropriate)

5.1	For the course	No
5.2	For the applications	Mandatory

6. Specific competences

Professional competences	• The ability to engage in lifelong learning. • Identification of the phenomena, theories and methods specific to the disciplines in electrical engineering or fields associated with it. • Carrying out projects of medium complexity using the association of knowledge, principles and theoretical methods. • Knowledge and use of various measuring devices specific to electrical engineering: multimeters, LC-meter, Q-meter, power sources.
Cross competences	• Applying the values and ethics of the engineering profession and responsible execution of professional tasks in conditions of restricted autonomy and qualified assistance. Promoting logical, convergent and divergent reasoning, practical applicability, evaluation and self-evaluation in decision-making. • Carrying out the activities and exercising the specific roles of teamwork on different hierarchical levels. Promoting the spirit of initiative, dialogue, cooperation, positive attitude and respect for others, diversity and multiculturalism and continuous improvement of one's own activity.

7. Discipline objectives (based on specific competencies acquired)

7.1	General objective	Knowledge of the introductory aspects in electrical and energy engineering.
7.2	Specific objectives	• Technical documentation, written and drawn: knowledge, preparation, use. • Electrotechnical components: construction, parameters and applications. • Implementation of technical projects.

8. Contents

8.1. Course (Lectures)		Number of hours	Teaching methods	Additional remarks
1	General problems of technology in electrical engineering. Processes and technological means.	2	Presentation and discussions.	
2	Electrotechnical products. General structure. Quality, energy and environmental performance and characteristics.	2		
3.	Representation and identification of elements. Terminals markings.	2		
4.	Marking of electrical conductors. Tolerances and series of nominal values.	2		
5.	The resistor as a circuit element. The technology of fixed, coiled resistors. Film resistors. Volume resistors.	2		
6.	Potentiometers. Winding potentiometer technology. Film potentiometers. Resistors and power potentiometers.	2		
7.	Capacitors. General construction and behaviour. Fixed paper capacitor technology.	2		

8.	Film capacitor technology. Ceramic capacitors. Electrolytic capacitors.	2		
9.	Power capacitors. Supercapacitors.	2		
10.	Semiconductor device technology. Manufacture of single crystals and silicon wafers.	2		
11.	Junction technology. Alloying. Diffusion. Epitaxy. Extrusion.	2		
12.	Basic technological operations in the production of semiconductor devices. Oxidation. Photolithographic masking in semiconductor component technology.	2		
13.	Planar technology. Metallization. Processing the shape of structures.	2		
14.	Connectors and Connection Technology.	2		

Bibliography

1. Comşa, D., Maier, V., Chindriş, M. *Documentaţia tehnico-economică în electrotehnică*. Litografia I.P.C.-N., 1993.
2. Pavel, S. Maier, V. *„Introducere în inginerie electrică*", U.T. PRESS, Cluj-Napoca, 2008, ISBN 978-973-662-379-0.

8.2. Applications - Seminar /Laboratory/Project		Number of hours	Teaching methods	Additional remarks
1	Identification and measurement of the parameters of fixed resistors and potentiometers.	2	Presentation, Experiment, Discussions.	The proposed project is a medium knowledge activity.
2	Identification and measurement of fixed capacitor parameters.	2		
3	Construction, technology and computing power transformers parameters.	2		
4.	Power transformer tests.	2		
5.	Design of power transformers (project).	2		
6.	Structure and technology of semiconductor devices.	2		
7.	Handing over the laboratory notebook, project support, lab make-up session.	2		

Bibliography

1. Maier, V. ş.a. Tehnologie electronică, Lucrări practice, Partea I-a. Cluj-Napoca, Litografia I.P.C.-N., 1982.
2. Maier, V. ş.a. Tehnologie electronică, Lucrări practice, Partea II-a. Cluj-Napoca, Litografia I.P.C.-N., 1990.
3. Pavel, S. Maier, V. „Introducere în inginerie electrică", U.T. PRESS, Cluj-Napoca, 2008, ISBN 978-973-662-379-0.

9. Alignment of course content with expectations of the epistemic community, professional associations, and representative employers in the field

Courses and applications take into account the requirements and expectations of the business environment: well-known companies in the field, collaborators from industrial and economic environments, colleagues from other university centres.

10. Assessment

Activity type	10.1 Assessment criteria	10.2 Assessment methods	10.3 Weight in the final grade (%)
10.4 Course	Involvement and discussions.	Written exam (E)	0.66
10.5 Laboratory	Activity in class and project implementation	Mark for project (P1) and mark for activity (L)	0.34
10.6 Minimum standard of performance: E, P1, L ≥ 5 Grade = [2·E+(P1+L)/2]/3			

Date of completion	Lecturers	Title/ Surname/ Name:	Signature
Nov 2024	Course	Sl.dr.ing. Cosmin DARAB	
	Applications Seminar/ Laboratory/ Project	Sl.dr.ing. Cosmin DARAB	
		Sl.dr.ing. Cosmin DARAB	

Date of approval in the EPS Department Council	**Head of Department:** Prof. Eng. MICU Dan Doru, PhD
Date of approval in the Faculty of Electrical Engineering Council	**Dean:** Assoc. Prof. Eng. CZIKER Andrei, PhD