



DISCIPLINE ACADEMIC SHEET
ACADEMIC YEAR 2025 – 2026

1. PROGRAMME DATA

1.1. Higher Education Institution	UNIVERSITY OF CRAIOVA
1.2. Faculty	Automation, Computers and Electronics
1.3. Department	Computers and Information Technology
1.4. Field of Study	Computers and Information Technology
1.5. Study level	L(License / Undergraduate)
1.6. Organizational form	IF
1.7. Study Program (name/code) /Qualification	Computers / L2060101010

2. DISCIPLINE DATA

2.1 Discipline Name	Electronic Devices and Analog Electronics						
2.2 Course Activities Holder	Lecturer PhD Eng. Cristian PÎRVU						
2.3. Practical Activities Holder	Lecturer PhD Eng. Cristian PÎRVU						
2.4. Study Year	2	2.5. Semester	3	2.6. Evaluation type	E	2.7. Discipline regime	DOB

3. ESTIMATED TOTAL TIME (hours per semester of teaching activities)

3.1. Number of hours per week	4	in which: 3.2 course	2	3.3. sem./lab./pr.	2
3.4. Total hours of curriculum	56	in which: 3.5 course	28	3.6. sem./lab./pr.	28
3.7. Time distribution - hours/week					hours
Study after manual, course support, bibliography and notes					30
Additional documentation in library, on specialized electronic platforms and field					10
Training seminars / labs, homework, portfolios and essays					25
Tutorial					-
Examinations					4
Other activities.....					-
Total hours per individual activities					69
3.8. Total hours per semester					125
3.9. Number of credits					5

4. PRECONDITIONS (where appropriate)

4.1. of curriculum	The student must have specialized knowledge acquired in the following disciplines: Physics, Mathematical Analysis, Logical Design, Electrotechnics
4.2. of competence	They are not necessary

5. CONDITIONS (where appropriate)

5.1. of the course	The course is taught using a video projector or an interactive touchscreen display in on-site version. Course support in
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	electronic format and access to up-to-date documentation is provided. The teaching process has the following structure: • 75% presentation based on the course support • 25% interactive activity (discussions with students) • The teaching process involves explaining the course support and also interactive activity (discussions with students). • A course support and a list of topics for the evaluation are provided, in electronic format, on Classwork, in the course class.
5.2. of seminar/ laboratory/project	• In on-site version, a video projector and the whiteboard or an interactive touchscreen display are used to present the topic of the meeting and for additional explanations, examples or answers to questions. • The on-line version of the seminar and laboratory consists of meetings organized using Google Classroom platform. • During the seminar activity several electronic devices and analog circuits are studied. • During the laboratory activity a simulation program is used to exemplify and understand the operation and testing of the main electronic devices and analog circuits. Homeworks are assigned. • The teaching activity is interactive and students are assessed during the semester as well as at the end of the semester. • Support is provided for seminar and laboratory work and testing topics, in electronic format, on Classwork.

6. COURSE OBJECTIVES – expected learning outcomes that are supported by completing and passing the course

Knowledge	Student/Graduate: 1. describes, identifies and summarizes basic concepts and methods relating to electronic devices and circuits and how to apply them in concrete applications 2. uses fundamental elements/concepts related to electronic devices, circuits and technology 3. analyzes electronic circuits and systems of low/medium complexity, in order to be able to design them 4. diagnoses/troubleshoots electronic circuits and equipment 5. uses electronic instruments and specific methods to characterize and evaluate the performance of electronic devices and circuits 6. designs and implements low/medium complexity electronic circuits using CAD technologies 7. performs temporal and spectral characterization of signals 8. uses simulation environments for signal analysis and processing 9. uses specific methods and tools for signal measurement and signal characterization in the time domain and in the frequency domain 10. designs elementary functional blocks with hardware implementation 11. uses basic knowledge associated with software programs and digital technologies to explain and interpret problems that arise in computer-aided design, theoretical-experimental investigation and computer data processing.
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Skills (Abilities)	Student/Graduate: 1. understands the physical basis for the main semiconductor devices, the behavior of these devices in circuits, as well as the basic circuits that perform certain electronic functions 2. identifies and uses electronic devices and analog electronic circuits, as well as linear integrated circuits of low/medium complexity 3. interprets theoretical and experimental results 4. applies the basic principles and methods of fundamental sciences to perform calculations, demonstrations, and develop specific projects 5. applies criteria and evaluation methods for modeling, experimentation, analysis and qualitative and quantitative assessment, using digital technologies 6. evaluates, based on supporting arguments, the quality and limitations of technical solutions, as well as their integration into complex structures.
Responsibility and autonomy	Student/Graduate: 1. applies the values of ethics and deontology of the engineering profession 2. practices logical reasoning, evaluation, and self-assessment in decision-making 3. communicate effectively about engineering activities 4. is engaged in lifelong learning, for acquiring and implementing knowledge as needed, using appropriate learning strategies 5. promotes dialogue, cooperation, respect for others 6. selects and analyzes bibliographic sources specific to electronics 7. demonstrates autonomy in learning on topics specific to electronics.

7. CONTENT

7.1. Course	The method of implementation (face to face/ synchronous online)	Teaching methods	Allocated time (hours)
Chapter 1. Semiconductor Diode. Applications - Overview of semiconductor diodes. Applications. - Special-purpose diodes : Zener diode, Varactor diode, Shockley diode. - Diode circuits: rectifiers, diode limiters, Zener voltage regulator.	face to face	The course is taught using a video projector or an interactive touchscreen display or using the meetings in Google Classroom: - 75% explanation of the course support; - 25% interactive activity (discussions with students). The necessary materials for the course are available to students in electronic format, on Google Classroom platform.	5
Chapter 2. The bipolar junction transistor. Applications - Overview of the bipolar junction transistor (BJT). Applications. - Overview of small signal amplifiers - BJT Circuits : Typical Single Stage Amplifier Circuit, Power Amp (class B)	face to face		5
Chapter 3. The field-effect transistor. Applications - Overview of the field-effect transistor (FET). Applications. - FET Circuits : FET constant current source, JFET as a voltage controlled resistor	face to face		5
Chapter 4. Optoelectronic devices. Applications - Photodetectors (e.g. photodiodes and phototransistors) - Light-emitting diodes (LEDs) - Optocouplers (opto-isolators)	face to face		5

- Examples and applications of optoelectronic devices			
Chapter 5. Operational amplifiers. Applications - Overview of operational amplifiers (op-amp) - Applications: op-amp amplifiers, differentiator and integrator circuits, op-amp comparators.	face to face		5
Chapter 6. Linear voltage regulators. Applications. - Voltage regulator types and working principle - Three terminal IC positive regulator: overview, applications	face to face		3
Bibliography:			
1. Gray P., Hurst P., Lewis S. and Meyer R., Analysis and Design of Analog Integrated Circuits (fifth edition), Wiley & Sons, 2009			
2. Allen, D. Holberg, CMOS Analog Circuit Design, 2nd Ed., Oxford 2002			
3. Dobkin B., Analog Circuit Design Volume 2, Newnes, 2013			
4. Purcaru D., Electronică. Note de curs, Editura Sitech, Craiova, 2011			
5. Purcaru D., Niculescu E., Dispozitive electronice și circuite analogice, Editura Reprograph, Craiova, 2009			
6. Niculescu E., Purcaru D.M., Dispozitive și circuite electronice. Vol. I, Ed. Universitaria, 2002			
7. Neacă M.I., Neacă A.M., Electronică analogică, Editura Universitaria, Craiova, 2020			
8. Răducu M., Electronică analogică : Teorie și aplicații, Editura Matrix Rom, București, 2009			
9. Gray, P.E., Meyer, C.R., Circuite integrate analogice. Analiză și proiectare, Ed. Tehnică, București, 1997			
10. Scherz P., Monk S., Practical Electronics for Inventors (fourth edition) , McGraw-Hill Education, 2017			
11. Pîrvu, C., Note de aplicație în electronica digitală, Albastra Casă de Editură (Grupul Microinformatica), Cluj-Napoca, 2007, ISBN 973-650-057-8			

7.2. Seminar	The method of implementation (face to face/synchronous online)	Teaching methods	Allocated time (hours)
1. Introduction	face to face	In on-site version, the video projector and whiteboard or the interactive display & touchscreen are used to present the topic of the meeting and for additional explanations, examples or answers to questions. The on-line version of the seminar and laboratory consists of meetings organized using Google Classroom platform. During the seminar activity several electronic devices and analog circuits are studied. The teaching activity is interactive. Support is provided for seminar, in electronic format, on Classwork	2
2. Diode limiters. Analysis and design	face to face		2
3. Other applications of Zener diode. Analysis and design	face to face		2
4. LED displays. Examples and applications	face to face		2
5. Optocoupler circuits. Analysis and design	face to face		2
6. Op-amp comparators. Analysis and design	face to face		4
Bibliography:			
1. Gray P., Hurst P., Lewis S. and Meyer R., Analysis and Design of Analog Integrated Circuits (fifth edition) , Wiley & Sons, 2009			
2. Dobkin, B., Analog Circuit Design Volume 2, Newnes, 2013			
3. Scherz P., Monk S., Practical Electronics for Inventors (fourth edition) , McGraw-Hill Education.			

2017
4. Pirvu C., Electronic devices and analog electronics – Seminar documentation, uploaded to Google Classroom classes, 2022-2023

7.3. Laboratory	The method of implementation (face to face/synchronous online)	Teaching methods	Allocated time (hours)
1. Overview of the laboratory activity	face to face	In on-site version, the video projector and whiteboard are used to present the topic of the meeting and for additional explanations, examples or answers to questions. The on-line version of the seminar and laboratory consists of meetings organized using Google Classroom platform. During the laboratory activity a simulation program is used to exemplify and understand the operation and testing of the main electronic devices and analog circuits. The teaching activity is interactive and students are assessed during the semester as well as at the end of the semester. Support is provided for laboratory work and testing topics, in electronic format, on Classwork.	2
2. Presentation of the simulation program for the study of electronic devices and analog circuits	face to face		2
3. Diode circuits. Experiments.	face to face		2
4. Op-amp amplifiers. Experiments.	face to face		2
5. Op-amp comparators. Experiments.	face to face		2
6. Recovery of laboratories	face to face		2
7. Assessment of acquired knowledge and practical skills	face to face		2

Bibliography:

1. Niculescu E., Purcaru D., Maria M., Electronică. Simulări, analize și experimente, Editura Reprograph, Craiova, 2006
2. Niculescu E., Purcaru D.M., Electronică. Îndrumar de laborator. Volumul I, Reprografia Universității din Craiova, 2000
3. Melnic V., Sisteme electronice de supraveghere, Editura Teora, București, 1999
4. Subțirelu Gh.E., Electronică analogică : Componente și circuite : Îndrumar de laborator, Editura Sitech, Craiova, 2013
5. Pirvu C., Electronic devices and analog electronics – Laboratory documentation, uploaded to Google Classroom class for laboratory, 2022-2023

8. Correlating the content of the discipline with the expectations of representatives from the epistemic community, professional associations and representative employers in the field related to the program

The discipline content was discussed with the representatives of the following companies:

- ☐ AUMOVIO Romania
- ☐ Continental – Sibiu
- ☐ CS Romania
- ☐ SC IPA SA Craiova
- ☐ VIG IMPEX Craiova

9. EVALUATION

Activity Type	9.1. Evaluation criteria	9.2. Evaluation methods	9.3. Final mark weight
9.4. Course	Understanding the theoretical foundations	Grid-type written exam from the topics	60%

	corresponding to electronic devices and analog circuits.	communicated from the subject matter taught in the course and seminar	
	Ability to make connections between the concepts taught.		
9.5. Seminar/laboratory	Ability to analyze and design simple analog circuits		
	Learning the skills of using electronic devices and analog circuits and evaluating their performance	Continuous assessment and testing at the end of the semester, the topics communicated	30%
9.6. Minimum standard of performance			
Correct application of linear electrical circuit theory to the analysis of electronic circuits. Use of basic technical knowledge to explain and interpret concepts using dedicated software programs. Experimental tracing of the static transfer characteristic. Use of technical communication language at a minimum standard of performance. • Accumulation of at least 5 points from the final grade. • 1 point is awarded ex officio to the final grade. • The calculation of the final grade is done by rounding the final score to the full grade.			

Date of Completion	Signature of the Course Activities Holder,	Signature of the Practical Activities Holder,
23.08.2025	Ș.l.dr.ing. Cristian PÎRVU	Ș.l.dr.ing. Cristian PÎRVU

Date of Approval in the Department	Signature of the Department Director,
25.08.2025	Ș.l.dr.ing. Nicolae ENESCU

Date of Approval in the Faculty	Signature of the Dean,
	Prof.dr.ing. Dorin ȘENDRESCU