



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 Measurements, Sensors and Transducers						
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	4	2.6. Evaluation type	V	2.7. Discipline regime	DOB

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

3.1. Number of hours per week	3	in which: 3.2 course	2	3.3. sem./lab./pr.	1
3.4. Total hours of curriculum	42	in which: 3.5 course	28	3.6. sem./lab./pr.	14
3.7. Time distribution - hours/week					hours
Study after manual, course support, bibliography and notes					15
Additional documentation in library, on specialized electronic platforms and field					5
Training seminars / labs, homework, portfolios and essays					10
Tutorial					-
Examinations					3
Other activities.....					-
Total hours per individual activities					33
3.8. Total hours per semester					75
3.9. Number of credits					3

4. PRECONDITIONS (where appropriate)

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

5. CONDITIONS (where appropriate)

5.1. of the course	• The course is taught using the video projector or the interactive touchscreen display. For some explanations and answers to questions in the room, the whiteboard is used. Course support in 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).
5.2. of laboratory	• At laboratory sessions, the existing electronic measurement, visualization or signal generation devices in the laboratory are studied, tested and used. The whiteboard is used to present the topic of the meeting and for additional explanations, examples or answers to questions. • During the laboratory activity a simulation program is used to exemplify and understand the operation and testing of the main electronic measuring and visualization devices. Homeworks are assigned; the teaching activity is interactive and students are assessed during the semester as well as at the end of the semester.

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

Knowledge	Student/Graduate: 1. identifies and describes basic concepts, principles and methods specific to the field of electrical and electronic measurements and their use in concrete applications 2. uses fundamental elements/concepts related to electronic measurement instrumentation and sensor/ transducers 3. analyzes electronic measurement circuits and systems of low/medium complexity with the aim of designing them 4. uses instruments and specific methods to characterize and evaluate the performance of systems 5. uses electronic instruments to measure and test electronic devices and passive components 6. uses specific methods and equipment for signal measurement and analysis and signal characterization in the time domain and in the frequency domain 7. designs elementary functional blocks of signal processing with hardware implementation
Skills (Abilities)	Student/Graduate: 1. uses fundamental methods of measuring electrical quantities 2. applies basic theorems, principles and methods from fundamental disciplines to elementary engineering calculations in systems design, under qualified assistance 3. performs calculations of medium complexity, associating them with graphic representations 4. appropriately uses standard evaluation criteria and methods from fundamental disciplines for the identification, modeling, analysis and qualitative and quantitative assessment of phenomena and characteristic parameters, as well as for the processing and interpretation of results from specific processes

Responsibility and autonomy	Student/Graduate:
	1. carries out project management processes, taking on different roles in the team and describing, clearly and concisely, verbally and in writing, the results 2. identifies the objectives to be achieved, the available resources, the work stages, the execution times, the deadlines and the associated risks; 3. identifies roles and responsibilities in a team and applies effective teamwork and relationship techniques 4. identifies opportunities for continuous training and efficient use of information sources, for his own development, and of communication and professional training resources 5. it promotes the spirit of initiative, dialogue, cooperation, positive attitude and respect towards others, continuous improvement of one's own activity.

7. CONTENT

7.1. Course	The method of implementation (face to face/ synchronous online)	Teaching methods	Allocated time (hours)
Chapter 1. Introduction - The general structure of a measurement, monitoring and control system. Example. - Elements of measurement technique. Measurement errors. - Characteristics of measuring systems.	face to face	The course is taught using the video projector or the interactive touchscreen display. - 75% explanation of the course support; - 25% 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.	2
Chapter 2. Electronic structures specific to measurement systems - Impedance matching for maximum voltage transfer. Examples. - Galvanic isolation. Examples. - Instrumentation amplifiers. Example. - Circuits for data conversion. Examples.	face to face		6
Chapter 3. Signal conditioning 2, 3 or 4 wire connection for resistance measurement. Example: Conditioning block with integrated adapter for RTD. Example: Conditioning block with RMS to DC converter.	face to face		4
Chapter 4. Instrumentation - Multimeters: equivalent circuits for the main functions, frequency and voltage measurement principles, alternating current voltmeters, example. - Numerical oscilloscopes: block diagram and operation, level synchronization principle, features, example.	face to face		6
Chapter 5. Examples of sensors, transducers and measuring systems - Sensors and transducers: basics, classifications, operating principles. - Temperature sensors. Intelligent temperature transducer. Example- Temperature control system. - Inductive and capacitive proximity sensors. System for controlling the linear movement of an	face to face		10

object between two extreme positions. - Ultrasonic sensors. Test system for an intelligent ultrasonic sensor.			
Bibliography:			
1. Purcaru D., Măsurări electronice, Universitaria Publishing House, Craiova, 2004			
2. Purcaru D.M., Senzori și traductoare. Volumul I, Reprograph Publishing House, Craiova, 2001			
3. Purcaru D., Electronică. Note de curs, Sitech Publishing House, Craiova, 2011			
4. Purcaru D.M., Sisteme senzoriale. Metode și algoritmi pentru recunoașterea tactilă a formelor, Sitech Publishing House, Craiova, 1997			
5. Sinclair, I., Sensors and Transducers. Third edition, Newness, 2001			
6. Ignea A., Stoiciu D., Măsurări electronice, senzori și traductoare, Politehnica Publishing House, Timișoara, 2007			
7. Alexandru M., Sisteme de măsurare cu traductoare, Matrix Rom Publishing House, București, 2012			
8. Ivanov V., Senzori și traductoare, Universitaria Publishing House, Craiova, 2018			
9. Pîrvu, C., Cepișcă, C., Sisteme informatizate de măsurare, Editura Electra, București, 2005, ISBN 973-7728-30-0			
10. Catalog sheets and technical books of sensors, transducers, circuits or electronic modules and apparatus presented			

7.2. Laboratory	The method of implementation (face to face/synchronous online)	Teaching methods	Allocated time (hours)
1. Overview of the laboratory activity	face to face	The topic of each laboratory session is presented with the video projector or the interactive touchscreen display. Students also perform experimental determinations using the studied devices. Documentation for lab assignments is posted on Google Classroom.	2
2. Digital multimeter presentation. Experiments.	face to face		2
3. Function generator presentation. Experiments.	face to face		2
4. 2-Channel and 4-channel digital oscilloscope presentation. Experiments.	face to face		4
5. Experiments with all studied devices.	face to face		2
6. Assessment of acquired knowledge and practical skills.	face to face		2

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 corresponding to sensors, transducers and	Grid written exam from the communicated subjects from the subject taught in the course	60%

	electronic measurements.		
	Understanding the behavior of sensors and how to use them in applications.		
	Ability to make connections between the notions taught.		
	Ability to analyze and design simple measurement / testing systems.		
9.5. Laboratory	Learning the skills of using measuring and visualizing devices 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 use of laboratory measuring devices and technical language, specific to the discipline, necessary for communication at a minimum standard of performance. Knowledge of basic definitions. • 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