



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	Diagnosis and Decision Techniques						
2.2 Course Activities Holder	S.l.dr. ing. Camelia MAICAN						
2.3. Practical Activities Holder	S.l.dr. ing. Camelia MAICAN						
2.4. Study Year	4	2.5. Semester	2	2.6. Evaluation type	E	2.7. Discipline regime	DFA

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	30	in which: 3.5 course	20	3.6. sem./lab./pr.	10
3.7. Time distribution - hours/week					hours
Study after manual, course support, bibliography and notes					20
Additional documentation in library, on specialized electronic platforms and field					10
Training seminars / labs, homework, portfolios and essays					10
Tutorial					-
Examinations					2
Other activities.....					3
Total hours per individual activities					45
3.8. Total hours per semester					75
3.9. Number of credits					3

4. PRECONDITIONS (where appropriate)

4.1. of curriculum	The student must possess specialized knowledge acquired in the following disciplines: Mathematical Analysis, Special Mathematics, Automatic System Theory, Automatic Control Engineering, Computer Programming and Programming Languages.
4.2. of competence	Using the fundamentals of automatic control, of the methods of modeling, simulation, identification and analysis of

5. CONDITIONS (where appropriate)

5.1. of the course	processes, and of computer-aided design techniques for automatic systems.
5.2. of seminar/ laboratory/project	-

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

Knowledge	The student/graduate identifies and describes the fundamental principles of technical system diagnosis and of decision-making under uncertainty.
Skills (Abilities)	The student/graduate operates with analytical methods and algorithms for system diagnosis and for making technical and operational decisions. The student solves practical diagnosis and decision problems in engineering, validating the efficiency of the proposed solutions.
Responsibility and autonomy	The student/graduate autonomously and responsibly manages decision-support and diagnosis systems, applying logical reasoning and self-assessment.

7. CONTENT

7.1. Course	The method of implementation	Teaching methods	Allocated time (hours)
1. System reliability. Basic notions 1.1 Defining the notion of reliability. 1.2 Forms of study and expression of reliability 1.3 Distribution laws used for defining reliability parameters 1.4 Building empirical reliability functions 1.5 Calculating system reliability. The reliability logic diagram. Types of connections.	face to face	The course is taught online or using the video projector. The teaching process has the following structure: • 80% theoretical presentation, based on the course support (slides) • 20% interactive activity (discussions with the students). The necessary materials will be made available to students in electronic format. Access to up-to-	4
2. Analytical methods for the detection and localization of faults in automatic systems 2.1 The importance of fault detection and localization 2.2 Faults in dynamic systems	face to face		2
2.3 Linear systems for fault detection and localization based on reference models 2.4 Modeling faulty actuators and transducers 2.5 Fault detection and localization using the multiple filter method 2.6 Fault detection and localization using the majority voting	face to face		10

method 2.7 Analytical detection and localization of faulty actuators 2.8 Fault detection and localization using the parity check method 2.9 Fault detection and localization using system sensitivity analysis		date documentation is provided.	
3. Introduction to decision problems 3.2 The main stages of the decision process 3.3 Classification of decision processes 3.4 Decision methods 3.5 Basic elements and concepts in solving the diagnosis problem	face to face		2
4. Techniques for modeling decisions under uncertainty 4.1 Elements of probability theory 4.2 Fault detection and localization using correlation functions 4.3 The classical model of uncertain reasoning - the Bayesian probabilistic model. Optimal decision rules	face to face		2
Bibliophy:			
1. Belea, C., V. Ionescu, (1985) Teoria sistemelor, Editura didactica si pedagogica, Bucuresti. 2. Catuneanu, V., A. Mihalache, (1983) Bazele teoretice ale fiabilitatii, Editura Academiei, Bucuresti 1983. 3. Iancu, E., M. Vinatoru (1999) - Detectia si localizarea defectelor in sistemele dinamice, Editura Sitech Craiova. 4. Iancu, E., M. Vinatoru (2003) Metode analitice pentru detectia și localizarea defectelor. Studii de caz, Editura Universitaria, Craiova, 2003, I.S.B.N. 973-8043-407-6.			

7.2. Seminar/laboratory/project	The method of implementation	Teaching methods	Allocated time (hours)
1. Detection and localization of faulty transducers. Fault compensation methods. Applying the majority voting principle.	face to face	The laboratory works are carried out using mock-ups and computer simulation programs. Students are provided with laboratory platforms containing a theoretical summary and the way of carrying out the work. Activities: • 50% carrying out the work • 50% interpretation of the results and discussions with the students	2
2. Fault detection and localization in dynamic systems. Methods based on the mathematical model. Generating the residual vector.	face to face		2
3. Detection and localization of faulty actuators within automatic systems.	face to face		2
4. Calculating the reliability of industrial systems	face to face		2
5. Control system protected against faults on the feedback path. Case study.	face to face		2
Bibliography:			
1. Iancu, E., M. Vinatoru (1999) - Detectia si localizarea defectelor in sistemele dinamice, Editura			

Sitech Craiova.

2. Iancu, E., M. Vinatoru (2003) Metode analitice pentru detecția și localizarea defectelor. Studii de caz, Editura Universitaria, Craiova.

3. Ungureanu, St., (1988) Sensibilitatea sistemelor dinamice, Editura tehnică, București.

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 course content was discussed with the representatives of: • SC IPA SA Craiova • SC ELPRECO SA Craiova • SC ELPREST SA Craiova

9. EVALUATION

Activity Type	9.1. Evaluation criteria	9.2. Evaluation methods	9.3. Final mark weight
9.4. Course	- Understanding the theoretical fundamentals of diagnosis and decision techniques. - The ability to make connections between the taught notions. - The capacity for analysis and synthesis in a concrete situation.	Written multiple-choice exam	80 %
9.5. Seminar/laboratory/project	- Interpretation of the results; - The solutions of the applications are presented and discussed within the group	Ongoing assessment	20%
9.6. Minimum standard of performance			
• Obtaining at least 50% of the score of the ongoing assessments, laboratory tests and final exam. • The final grade is calculated by rounding the final score to a whole grade.			

Date of Completion	Signature of the Course Activities Holder,	Signature of the Practical Activities Holder,
23.08.2025	S.l.dr. ing. Camelia MAICAN	S.l.dr. ing. Camelia MAICAN

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