SYLLABUS

1. Program Information

1.1 Higher education institution	Technical University of Cluj-Napoca
1.2 Faculty	Faculty of Automation and Computer Science
1.3 Department	Department of Automation
1.4 Field of study	Automation, Applied Informatics and Intelligent Systems
1.5 Cycle of studies	Bachelor
1.6 Study Programme/Qualification	Intelligent automation systems
1.7 Form of education	IF – full-time education
1.8 Course code	59.00

2. Course information

2.1 Course title					**Diploma Project**	
2.2 Course lecturer						
2.3 Seminar / Laboratory / Project Lecturer					*Conf.dr.ing. Roxana Rusu-Both (program responsible)*	
2.4 Year of study	4	2.5 Semester	2	2.6 Type of assessment		V
2.7 Course status	Formative category *(DF, DS, DC)*					DS
	Optionality *(DI, DO, DFac)*					DOB

3.Total estimated time

3.1 Number of hours per week	9	of which:	HEI	Lecture	0	Seminar	0	Laboratory	0	Project	0
			CO		0		0		0		9
3.2 Number of hours per semester	126	of which:	HEI	Lecture	0	Seminar	0	Laboratory	0	Project	0
			CO		0		0		0		126

3.3 Distribution of time allocation (hours per semester) for:	HEI	CO
(a) Study based on textbook, course support, bibliography, and notes		28
(b) Additional documentation in library, specialized electronic platforms, and fieldwork		28
(c) Preparation of seminars/laboratories, assignments, papers, portfolios and essays		
(d) Tutoring		9
(e) Examinations		9
(f) Other activities:		
3.4 Total individual study hours (sum (3.3(a)... 3.3(f)))		74
3.5 Total hours per semester (3.2+3.4)		200
3.6 Number of credits per semester		8

(HEI = Higher Education Institution, CO = Company)

4. Prerequisites (where applicable)

4.1 Curriculum Prerequisites	• Working in the diploma field in company
4.2 Competency Prerequisites	• Industrial research and design skills • All prerequisite courses have been successfully completed with satisfactory grades.

5. Conditions (where applicable)

5.1. Course Organization Conditions	NA
5.2. Seminar / Laboratory / Project organization conditions	• Conducted in collaboration with Emerson company, with access to real-world industrial data, tools, and mentorship. • Active participation and consistent communication with company supervisors. • Mandatory attendance and progress updates.

	• Compliance with internal company confidentiality policies.

6. Specific Competencies Acquired

Professional Competencies	• PC04 Conduct literature research • PC06 Define technical requirements • PC12 Gather technical information • PC15 Manage research data • PC21 Report analysis results • PC23 Synthesise information • PC26 Use information technology tools
Transversal Competencies	• TC02 Think analytically • TC05 Interpret mathematical information

7. Learning outcomes

Knowledge:	• The student will be able to describe and explain industrial data analysis, system modeling, and automation implementation techniques relevant to the Emerson industrial environment.
Skills:	• The student will be able to apply and integrate theoretical and practical knowledge in developing a complex engineering solution. • The student will be able to develop, document, and implement solutions that meet industrial standards and real-world requirements.
Responsibility and autonomy:	• The student will be able to work independently and collaboratively to complete project objectives, adapting to Emerson's industrial practices. • The student will be able to take responsibility for ensuring the quality and reliability of their project work, respecting professional ethics and company standards.

8. Course Objectives

8.1 General objective of the course	• To enable students to **apply and integrate** their theoretical knowledge in a real industrial environment, demonstrating practical skills and professional responsibility in the development of their bachelor thesis.
8.2 Specific objectives	• To develop students' ability to manage an engineering project in an industrial context. • To enhance research and development (R&D) skills in automation and industrial control systems. • To foster collaboration with industrial partners and effectively document and present project outcomes. • To prepare students for engineering challenges and professional environments after graduation.

9. Contents

9.1 Lectures	No. of hours	Teaching methods	Obs.
Bibliography			

9.2 Seminar / laboratory / project	Hours HEI	Hours CO	Teaching methods	Obs.
Defining project objectives and scope in collaboration with Emerson mentors		9		
Literature review and industrial data analysis		18		
Design and implementation of hardware/software solutions		36		
Testing, validation, and troubleshooting		36		
Documentation and final report preparation		18		
Final presentation of the project in front of a mixed academic and industrial panel		9		

Bibliography

1. Company-specific materials and technical manuals: Internal Emerson documentation and Sharepoints (PMO, SMO, etc.) Internal Tools and Processes
2. Emerson Standards and Guidelines
3. Scientific literature related to the project topic

10. Correlation of course content with the expectations of the epistemic community representatives, professional associations, and major employers in the field related to the program

This diploma project integrates practical skills and theoretical knowledge to meet the expectations of the automation engineering community and major industrial employers like Emerson. The project provides students with a real-world engineering experience that enhances their employability and meets ARACIS standards for final-year engineering projects.

11. Evaluation

Activity Type	Evaluation criteria	Evaluation methods	Weight in final grade
11.1 Lecture	NA	NA	
11.2.1 Project work	**Quality of implementation, relevance, and innovation**	Continuous evaluation, progress reports, and final written report	70%
11.2.2 Final Presentation	**Clarity of presentation, documentation quality, and defense of results**	Oral presentation and Q&A panel with company experts	30%

11.3 Minimum Performance Standard

- Project report and presentation grade ≥ 5;
- Compliance with Emerson's industrial standards

Date of completion:	Lecturers	Title First Name LAST NAME	Signature
15.09.2025			
	Applications	Conf.dr.ing. Roxana Rusu-Both (program responsible)	

Date of approval by the Department of Automation Council 24.11.2025 Date of approval by the Faculty of Automation and Computer Science Council 28.11.2025	Director of the Department of Automation Prof.dr.ing. Honoriu VĂLEAN Dean Prof.dr.ing. Vlad MUREȘAN