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 (dual, in English language)
1.7 Form of education	IF – full-time education
1.8 Course code	57.00

2. Course information

2.1 Course title		**Project Management for Industrial Automation**		
2.2 Course lecturer		*Conf.dr.ing. Paula Raica – Paula.Raica@aut.utcluj.ro*		
2.3 Seminar / Laboratory / Project Lecturer		*Dr.ing. Filip Cristian (Emerson)* *Ing. Ciprian Iakab (Emerson)*		
2.4 Year of study	4	2.5 Semester	2	2.6 Type of assessment	E
2.7 Course status	Formative category *(DF, DS, DC)*			DS
	Optionality *(DOB, DOP, DFac)*			DOB

3.Total estimated time

3.1 Number of hours per week	4	of which:	HEI	Lecture	2	Seminar	0	Laboratory	0	Project	0
			CO		0		0		0		2
3.2 Number of hours per semester	56	of which:	HEI	Lecture	28	Seminar	0	Laboratory	0	Project	0
			CO		0		0		0		28

3.3 Distribution of time allocation (hours per semester) for:	HEI	CO
(a) Study based on textbook, course support, bibliography, and notes	30	
(b) Additional documentation in library, specialized electronic platforms, and fieldwork	15	
(c) Preparation of seminars/laboratories, assignments, papers, portfolios and essays		20
(d) Tutoring		
(e) Examinations	2	2
(f) Other activities:		
3.4 Total individual study hours (sum (3.3(a)... 3.3(f)))	47	22
3.5 Total hours per semester (3.2+3.4)	75	50
3.6 Number of credits per semester	3	2

(HEI = Higher Education Institution, CO = Company)

4. Prerequisites (where applicable)

4.1 Curriculum Prerequisites	• System engineering I • System engineering II
4.2 Competency Prerequisites	• Ability to understand components of an automation architecture • Familiarity with industrial standards and protocols • Computer Proficiency and Basic Software Skills

5. Conditions (where applicable)

5.1. Course Organization Conditions	• Access to a projector, internet connection, and Microsoft Office or equivalent tools.
5.2. Seminar / Laboratory / Project organization conditions	• Access to computers with Azure DevOps or project management software, shared workspace, and collaboration tools.

6. Specific Competencies Acquired

Professional Competencies	• PC06 Define technical requirements • PC12 Gather technical information • PC13 Interact professionally in research and professional environments • PC18 Perform project management • PC23 Synthesize information • PC26 Use information technology tools
Transversal Competencie	• TC02 Think analytically • TC03 Demonstrate responsibility • TC04 Work in teams

7. Learning outcomes

Knowledge:	• Describe the full lifecycle of industrial automation projects, including specification, design, implementation, operation, and maintenance phases. • Explain the fundamental principles of project management applied to industrial automation, such as task planning, scheduling, resource allocation, and cost estimation. • Compare and differentiate industry standards relevant to automation project planning.
Skills:	• Construct a work breakdown structure (WBS), project schedule, and resource plan using project management tools. • Analyze functional and technical specifications to extract key project requirements and constraints. • Develop project documentation including risk assessments, Gantt charts, and progress reports. • Use software tools to plan, monitor, and revise automation project timelines and resource allocations.
Responsibility and autonomy:	• Demonstrate accountability in completing project tasks individually and as part of a multidisciplinary team. • Justify project decisions based on risk, quality, and resource considerations in a professional context. • Initiate proactive communication with stakeholders and manage project updates and changes responsibly.

8. Course Objectives

8.1 General objective of the course	• To provide students with a comprehensive understanding of the principles, tools, and practices required to effectively plan, manage, and execute industrial automation projects across their full lifecycle—from requirements specification through design, implementation, and maintenance—while considering technical, organizational, and economic constraints
8.2 Specific objectives	• To develop the ability to plan automation projects using standard project management methodologies, including task scheduling, resource allocation, budgeting, and progress tracking. • To build competence in interpreting technical requirements and functional specifications and translating them into

	actionable project deliverables within an automation context.
	• To prepare students to manage the operational and maintenance phases of automation projects, ensuring continuity, reliability, and alignment with quality and compliance standards.

9. Contents

9.1 Lectures	No. of hours	Teaching methods	Obs.
Execution Strategy Introduction to project lifecycle models and execution strategies tailored to industrial automation projects, including waterfall, iterative, and hybrid approaches.	2	Lecture, case discussion, examples, review methods, case studies	
Schedule Management Planning and controlling project timelines using tools such as Gantt charts and the Critical Path Method (CPM), with a focus on automation-specific milestones.	4		
Scope Management Defining project objectives, boundaries, and deliverables through tools like Work Breakdown Structures (WBS) to ensure clarity and prevent scope creep.	2		
Cost Management Estimating, budgeting, and managing project costs with an emphasis on capital and operational expenditures in automation projects.	2		
Change Management Identifying and controlling project changes in scope, schedule, or resources, and assessing their impact on technical and business outcomes	2		
Communication Management Developing communication plans and ensuring effective information flow among stakeholders, vendors, and project teams.	2		
Resource Management Planning and allocating personnel, materials, and technical resources, while addressing availability, conflicts, and workload balancing.	2		
Project Risk Management Identifying, analyzing, and mitigating risks associated with technical uncertainties, supply chain issues, and operational challenges.	4		
Procurement Management Planning and managing the procurement of automation equipment and services, including specifications, bidding, and vendor selection.	2		
Customer Satisfaction Survey Assessing stakeholder satisfaction through structured feedback to evaluate performance and identify areas for continuous improvement.	2		
Project Closing Formalizing project completion through documentation, contract closure, and knowledge transfer activities.	2		

Project Transfer to Customer Organizing system commissioning, training, and documentation for smooth transition to operation and customer ownership.	2			

Bibliography
(UTCN)

[1] Project Management Institute. *A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 7th Edition*, PMI, 2021.
[2] Juana Clark Craig. *Project management lite*, CreateSpace Independent Publishing Platform, 2012

9.2 Seminar / laboratory / project	Hours HEI	Hours CO	Teaching methods	Obs.
Students may choose one of the project subjects: **1. Creating a Standardized Project Management Plan for Oil & Gas or Pharma Industries** Students will build a complete project management plan based on an existing project, using standardized documents and templates. They will adapt the plan for applications in different industries, such as Oil & Gas and Pharma, based on real client proposals. The goal is to apply project management principles across varied industry contexts. • Review the previous project and gather client proposals from the Oil & Gas and Pharma industries to understand their specific requirements. • Develop a detailed project management plan using standardized templates, covering key areas like scope, schedule, and risk. • Customize the project plans to meet the unique needs and regulations of each industry, ensuring alignment with client expectations. **2. Software project management** • Kick off the project by creating an Azure DevOps dashboard to track all features with commitment levels and tags, then share a PDF summary and send commitment emails to stakeholders. • Run bi-weekly audit meetings using dashboards that monitor feature risks, bugs, customer escalations, and project velocity, notifying managers ahead for review. • Develop and execute a Validation and Verification (VnV) plan with the development and localization teams, scheduling monthly test days to ensure quality and translation accuracy. • Review third-party software components by documenting them, assessing vulnerabilities with feature teams, coordinating licensing reviews, and integrating feedback into the project. • Conduct a project retrospective by collecting team feedback and analyzing key metrics such as delivered features, missed targets, costs, and timeline adherence.		28	Case study analysis, Guided workshops, Collaborative group work, Project-based learning	

Bibliography
(Emerson/NI library)

[1] Schmidt, Terry. *Strategic Project Management Made Simple: Solution Tools for Leaders and Teams*, Wiley, 2009.

[2] Project Management Institute. *A Guide to the Project Management Body of Knowledge (PMBOK® Guide), 7th Edition*, PMI, 2021.
[3] Snijders, Paul; Wuttke, Thomas; Zandhuis, Anton. *A Pocket Companion to PMI's PMBOK Guide*, Van Haren Publishing, 2013.
[4] Barker, Stephen; Cole, Rob. *Brilliant Project Management: What the Best Project Managers Know, Do and Say*, Pearson, 2015.
[5] DeMarco, Tom; Lister, Timothy. *Peopleware: Productive Projects and Teams*, Addison-Wesley, 3rd Edition, 2013.

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

The course content is carefully aligned with the competencies and skills prioritized by the epistemic community, ensuring relevance to current academic and research standards in the field.
The course integrates input from professional associations and leading employers to prepare students for the practical demands and expectations of the industry.

11. Evaluation

Activity Type	Evaluation criteria	Evaluation methods	Weight in final grade
11.1 Lecture	Understanding of project management concepts, application of planning tools	Quizzes, participation in discussions, and written exam	50%
11.2 Seminar/ Laboratory/Project	Quality of project deliverables	Project plan submission, group presentation, and instructor feedback	50%
11.3 Minimum Performance Standard			
Achieve at least 50% on all assessments and deliver a complete, coherent project plan			

Date of completion: 16.09.2025	Lecturers		Signature
	Course	Conf.dr.ing. Paula Raica	
	Applications		

Date of approval by the Department of Automation Council	Director of the Department of Automation
_____24.11.2025_____	Prof.dr.ing. Honoriu VĂLEAN
Date of approval by the Faculty of Automation and Computer Science Council	Dean
_____28.11.2025_____	Prof.dr.ing. Vlad MUREȘAN