SYLLABUS

Robotic Process Automation

University year 2025-2026

1. Information regarding the programme

1.1. Higher education institution	Babeș-Bolyai University Cluj-Napoca
1.2. Faculty	Faculty of Mathematics and Computer Science
1.3. Department	Department of Computer Science
1.4. Field of study	Computer Science
1.5. Study cycle	Bachelor
1.6. Study programme/Qualification	Computer Science
1.7. Form of education	Full time

2. Information regarding the discipline

2.1. Name of the disc	ciplir	ne Robotic P	Robotic Process Automation					Discipline code	MLE5147
2.2. Course coordinator				Assoc.prof.phd. Andreea-Diana Pop					
2.3. Seminar coordinator				Assoc.prof.phd. Andreea-Diana Pop					
2.4. Year of study 3 2.5. Semester 5 2.6. Type of evaluati			on	С	2.7. Disc	ipline regime	Optional		

3. Total estimated time (hours/semester of didactic activities)

3.1. Hours per week	3	of which: 3.2 course	2	3.3 seminar/laboratory/project	1
3.4. Total hours in the curriculum	42	of which: 3.5 course	28	3.6 seminar/laboratory/project	14
Time allotment for individual study (l	D) and	self-study activities (S	A)		hours
Learning using manual, course support,	bibliogra	aphy, course notes (SA)			10
Additional documentation (in libraries, o	on electr	onic platforms, field doo	cumenta	tion)	15
Preparation for seminars/labs, homework, papers, portfolios and essays					20
Tutorship					6
Evaluations					7
Other activities:					-
3.7. Total individual study hours 58					
3.8. Total hours per semester	100				
3.9. Number of ECTS credits	4				

4. Prerequisites (if necessary)

4.1. curriculum	OOP, Programming Fundamentals, Advanced Programming Methods
4.2. competencies	Good programming skills in at least one of the programming languages Java, C#

5. Conditions (if necessary)

5.1. for the course	Course hall with projector			
5.2. for the seminar /lab activities	Laboratory: computers and use of a programming language environment			
6.1. Specific competencies acquired ¹				

¹ One can choose either competences or learning outcomes, or both. If only one option is chosen, the row related to the other option will be deleted, and the kept one will be numbered 6.

Professional/essential competencies	 advanced programming skills in high-level programming languages development and maintenance of software systems use of software tools in an interdisciplinary context
Transversal competencies	 application of organized and efficient work rules, of responsible attitudes towards the didactic-scientific field, to bring creative value to own potential, with respect for professional ethics principles and norms use of efficient methods and techniques to learn, inform, research and develop the abilities to bring value to knowledge, to adapt at the requirements of a dynamical society and to communicate efficiently in English

6.2. Learning outcomes

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Knowledge	• The graduate has the ability to develop, design and create new applications, systems or products using best practices of the field.
Skills	• The graduate has the ability to evaluate different architectures and possible solutions to a problem and choose the right one for the specific requirements and constraints of the application to be developed.
Responsibility and autonomy:	• The graduate has the ability to choose and use existing modules and environments for application development.

7. Objectives of the discipline (outcome of the acquired competencies)

7.1 General objective of the discipline	 Enhance the students understanding on business process identification and its automation. Provide the students with an environment in which they can explore the usage and usefulness of software development to increase efficiency in business processes. Induce a realistic and industry driven view of software development for business process automation related concepts and their inherent benefits.
7.2 Specific objective of the discipline	 Give students the ability to explore various ways to automate business processes. Improve the students' abilities to tackle on goal driven process automation. Enhance the students understanding of process automation value in business. Students will be able to use various tools, e.g., UiPath Studio, in order to provide a process automation solution. Students will be able to design and develop a business process automation solution following specific requirements and real world case studies available on RPA learning platforms.

8. Content

8.1	Course	Teaching methods	Remarks
1.	Robotic Process Automation (RPA)		
	1.1. Business Process Identification	Interactive exposure	
	1.2. Introduction to UiPath Studio	• Explanation. Conversation	
	1.2.1. Basics concepts	Didactical demonstration	
	1.2.2. UiPath Platform Architecture		
2.	Data manipulation		
	2.1. Variables. Data types	Interactive exposure	
	2.2. Control flow structures	• Explanation. Conversation	
	2.3. Scalar variables. Collections. Tables	Didactical demonstration	
	2.4. Text manipulation		
3.	User Events. Recorder		
	3.1. User Events	T, ,	
	3.2. Recorder	Interactive exposure	
	3.2.1. Basic recording	Explanation. Conversation	
	3.2.2. Desktop recording	 Didactical demonstration 	
	3.2.3. Web recording		
4.	Advanced UI Interaction		
	4.1. Input/output methods	Interactive exposure	
	4.2. Screen scraping	Explanation. Conversation	
	4.3. Data scraping	 Didactical demonstration 	
5.	Selectors	· · · · ·	
	5.1. Definition and access	Interactive exposure	
	5.2. Customization and debugging	Explanation. Conversation	
	5.3. Dynamic selectors	 Didactical demonstration 	
6.	Image and Text Automation	Interactive exposure	
	6.1. Keyboard Automation	Fynlanation Conversation	
	6.2. Information Retrieval	 Didactical demonstration 	
7	Evcal Data Tables	Interactive exposure	
7.	7.1 Basic Interactions	Evaluation Conversation	
	7.2 Data Processing	 Explanation: Conversation Didactical demonstration 	
0	DDE Asstantian	Diuactical demonstration	
а.	PDF Automation	Interactive exposure Finite active exposure	
	0.1. Data Extraction	• Explanation. Conversation	
-	8.2. Anchor base Activity	Didactical demonstration	
9.	E-mail Automation	Interactive exposure	
	9.1. E-mail interaction	Explanation. Conversation	
	9.2. E-mail sending	Didactical demonstration	
10	Orchestrator	Interactive exposure	
	10.1. Basic Features	• Explanation Conversation	
	10.2. Jobs. Scheduler	Didactical demonstration	
	10.3. Assets. Queues		
11	Debugging and Exception Handling	Interactive exposure	
	11.1. UiPath debugging tools	Explanation, Conversation	
	11.2. Input issues	Didactical demonstration	
	11.3. Error catching		
12	Robotic Enterprise Framework	Interactive exposure	
	12.1. ReFramework Architecture	• Explanation. Conversation	
	12.2. Examples	Didactical demonstration	
13	Testing. Deployment	Interactive exposure	
	13.1 Testing the RPA Solution	 Explanation, Conversation 	
	ibili lebeing the full bolution		
	13.2. Deploying an RPA Solution	Didactical demonstration	
14	13.2. Deploying an RPA Solution RPA Security Related Topics	Didactical demonstration	
14	13.2. Deploying an RPA Solution RPA Security Related Topics 14.1. Security Challenges	 Didactical demonstration Interactive exposure Explanation Conversation 	
14	13.2. Deploying an RPA Solution RPA Security Related Topics 14.1. Security Challenges 14.2. IDE Security	 Didactical demonstration Interactive exposure Explanation. Conversation Didactical demonstration 	

	14.4. Orchestrator Security					
Bib	oliography					
	1. Institute for RPA (2015), An Introduction	. Institute for RPA (2015), An Introduction to RPA, A primer, http://irpaai.com/wp-				
	content/uploads/2015/05/Robotic-Proc	cess-Automation-June2015.pdf				
	2. Steve Kaelble (2018), RPA, https://www.	icsanalytics.com/wp-				
	content/uploads/2019/02/robotic_proce	ess_automation_for_dummies.pdf				
	3. KPMG (2018), RPA, https://home.kpmg/	content/dam/kpmg/jp/pdf/jp-en-rj	<u>pa-business-improvement.pdf</u>			
	4. Tom Taulli (2020), The robotic Process A	utomation Handbook. A guide to imp	plementing RPA systems, Apress,			
	https://link.springer.com/book/10.1007	/978-1-4842-5729-6				
	5. Guðrún Lilja Sigurðardóttir (2018), Robo	otic Process Automation - Dynamic R	oadmap for Successful			
	Implementation, master thesis.					
	6. UiPath, <u>https://www.uipath.com/develop</u>	<u>pers/video-tutorials</u>				
	7. UiPath Studio Docs (2023) - https://docs	s.uipath.com/studio/docs/release-no	otes-2022-10-3			
	8. UiPath Academy - https://academy.uipat	<u>h.com/</u>				
8.2	Seminar / laboratory	Teaching methods	Remarks			
1.	Laboratory 1	Procontation Conversation				
	UiPath Studio installation	Dialoguo Caso studios				
	RPA project setup	Dialogue, case studies				
2.	Laboratory 2	Presentation, Conversation,				
	Sequences. Flowcharts	Dialogue, Case studies				
3.	Laboratory 3	Presentation, Conversation,				
	Custom activities. Data processing	Dialogue, Case studies				
4.	Laboratory 4	Presentation, Conversation,				
	Excel Automation	Dialogue, Case studies				
5.	Laboratory 5	Presentation, Conversation,				
	PDFs Automation	Dialogue, Case studies				
6.	Laboratory 6	Presentation, Conversation,				
	E-mail Automation	Dialogue, Case studies				
7.	Laboratory 7	Evaluation				
	Project turn-in/Demo					
Bib	oliography					
See	See references from the Lectures					

9. Corroborating the content of the discipline with the expectations of the epistemic community, professional associations and representative employers within the field of the program

- The course exists in the studying program of all major universities abroad.
- The content of the course is considered relevant by the software companies that design and implement automation solutions for business processes.

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade	
	Completion of on-line			
10.4 Course	Courses. The grade is	Facultative - Bonus activity	10%	
	denoted by B . (individual	Tacultative - Donus activity	1070	
	activity)			
	Three out of six lab			
	activities will be graded.		30%	
	The arithmetic average of	Laboratory Activity		
	the grades is denoted by L .			
10.5 Seminar/Jaboratory	(individual activity)			
10.5 Seminar / laborator y	Project - Design and			
	develop a solution for		70%	
	business process	Project grading		
	automation in UiPath			
	Studio. The grade is			

	denoted by P . (group of 2-3			
	students)			
10.6 Minimum standard o	f performance			
• The final grade (M) is computed as follows: M = 10%B + 30%L+70%P.				
• At least M >= 5.00 is favourable to pass this course exam.				
 Students will be able to design and develop an automation solution for a repetitive business process, considering an identified flow. 				

• Students will be able to use the components of the UiPath platform and to use them properly.

11. Labels ODD (Sustainable Development Goals)²

Not applicable.

Date: 31 April 2025 Signature of course coordinator

Assoc.prof.phd. Andreea-Diana Pop

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Signature of seminar coordinator

Assoc.prof.phd. Andreea-Diana Pop

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Date of approval:

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Signature of the head of department

Assoc.prof.phd. Adrian STERCA

² Keep only the labels that, according to the *Procedure for applying ODD labels in the academic process*, suit the discipline and delete the others, including the general one for *Sustainable Development* – if not applicable. If no label describes the discipline, delete them all and write *"Not applicable."*.