

SYLLABUS

Designing innovative products

University year 2025-2026

1. Information regarding the programme

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

2. Information regarding the discipline

2.1. Name of the discipline		Designing innovative products					Discipline code		MLE0095		
2.2. Course coordinator					Ph.D. Ileni Tudor Alexandru						
2.3. Seminar coordinator					Ph.D. Ileni Tudor Alexandru						
2.4. Year of study		3	2.5. Semester		5	2.6. Type of evaluation		VC	2.7. Discipline regime		Optional

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

3.1. Hours per week	2	of which: 3.2 course		3.3 seminar/laboratory/project	2
3.4. Total hours in the curriculum	28	of which: 3.5 course		3.6 seminar/laboratory/project	28
Time allotment for individual study (ID) and self-study activities (SA)					hours
Learning using manual, course support, bibliography, course notes (SA)					3
Additional documentation (in libraries, on electronic platforms, field documentation)					5
Preparation for seminars/labs, homework, papers, portfolios and essays					10
Tutorship					2
Evaluations					2
Other activities: two-way communication with the assigned challenge owner					1
3.7. Total individual study hours		23			
3.8. Total hours per semester		50			
3.9. Number of ECTS credits		2			

4. Prerequisites (if necessary)

4.1. curriculum	
4.2. competencies	- Write code in a high-level programming language - Being able to work in a software development team - Familiar with versioning control tools as GIT

5. Conditions (if necessary)

5.1. for the course	
5.2. for the seminar /lab activities	Use Microsoft Teams for file sharing and news

6.1. Specific competencies acquired ¹

Professional/essential competencies	• development and maintenance of software systems • use of software tools in an interdisciplinary context
Transversal competencies	• efficient development of organized activities in an interdisciplinary group and the development of empathetic abilities for interpersonal communications, to relate to and cooperate with various groups • 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 Romanian language and in an international language

6.2. Learning outcomes

Knowledge	• The graduate has the necessary knowledge related to software life cycle stages and software process models. • The graduate is familiar with the concepts related to software modelling and is able to implement functional and non-functional requirements described in specific documents for the analysis and design of software systems.
Skills	• The graduate has the necessary skills for computer program design and software systems analysis. • The graduate is familiar with project management tools, version control systems, and continuous integration/continuous delivery (CI/CD) concepts, methods, tools.
Responsibility and autonomy:	• The graduate has the ability to develop, design and create new applications, systems or products using best practices of the field. • The graduate is able to identify complex problems and examine related issues to develop solving options and implement solutions.

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

7.1 General objective of the discipline	• The discipline will enable the students to understand what innovation means in building a digital product
7.2 Specific objective of the discipline	• Identify and describe a real-world problem • Find a viable digital solution for the identified problem • Define and understand the end user • Using innovative tools and processes, create a digital solution.

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.

8. Content

8.1 Course	Teaching methods	Remarks
Bibliography		
8.2 Seminar / laboratory	Teaching methods	Remarks
1. Innovation in project Management discussion, teamwork	discussion, teamwork	
2. Market research, opportunities and needs assessment	discussion, brainstorming, teamwork	
3. Innovation in UX/UI	discussion, brainstorming, teamwork	
4. Customer segmentation, empathy map and persona	discussion, teamwork	
5. Innovative products with AI. Part 1	discussion, case study	
6. Lean Startups Canvas	discussion, teamwork	
7. Innovative products with AI. Part 2	discussion, teamwork	
8. Value proposition design	discussion, teamwork	
9. IoT and Cloud	discussion, teamwork	
10. Business Model Canvas design 1	discussion, teamwork, research	
11. Data driven innovation	discussion, teamwork, research	
12. Prototyping	discussion, teamwork	
13. Habit forming products	discussion, teamwork	
14. Final pitch, demo day	evaluation	
Bibliography		
• George Anderson, Design Thinking for Tech: Solving Problems and Realizing Value, Pearson, 2023 • Nigel Cross, Design Thinking: Understanding how designers think and work, 2023 • Michael Lewrick, Design Thinking and Innovation Metrics, 2023 • Melissa Schilling, Strategic Management of Technological Innovation, McGrawHill, 2022 • Harold Kersner, Innovation Project Management, Wiley, 2023 • Angelo Bonomi, Technology Innovation: Models, Dynamics, and Processes, CRC Press, 2023 • Richard McCuen, Critical Thinking, Idea Innovation, and Creativity, CRC Press, 2023 • Nir Eyal, Hooked: How to Build Habit-Forming Products, Penguin, 2014 • Jim Collins Jerry, Porras: Built to Last: Successful Habits of Visionary Companies, Random House, 2005. • Jakob Nielsen and Raluca Budi: Mobile Usability, MITP-Verlags GmbH & Co. KG, 2013. • Nielsen Norman Group, World Leaders in Research-Based User Experience https://www.nngroup.com/ • Application development for innovative application • George Anderson, Design Thinking for Tech: Solving Problems and Realizing Value, Pearson, 2023 • Nigel Cross, Design Thinking: Understanding how designers think and work, 2023 • Michael Lewrick, Design Thinking and Innovation Metrics, 2023		

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

- Enhancing the innovative thinking of the students from both business and technical perspectives prepares them for the current more demanding workspaces. The proposed methods are beneficial for them even if they choose to become entrepreneurs and create their own startups, with the innovative solutions, or if they join a company as employee.
- Industry and society demand entrepreneurial and innovation skills to be taught in university

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Percentage of final grade
10.4 Course			
10.5 Seminar/laboratory	Seminar activity	Continuous observation	40%
	Final project presentation	Oral examination	60%
10.6 Minimum standard of performance			
• At least grade 5 (from a scale from 1 to 10) to pass the discipline • Basic notions of entrepreneurship, and basic product development phases to be acquired			

11. Labels ODD (Sustainable Development Goals)²

Not applicable.

Date:

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Signature of course coordinator

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Signature of seminar coordinator

Ph.D. Ileni Tudor Alexandru



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.“.

