

SYLLABUS

1. Data about the program of study

1.1 Institution	The Technical University of Cluj-Napoca
1.2 Faculty	Faculty of Automation and Computer Science
1.3 Department	Automation
1.4 Field of study	System's Engineering
1.5 Cycle of study	Master
1.6 Program of study / Qualification	Cyber Physical Systems
1.7 Form of education	Full time

2. Data about the subject

2.1 Subject name	Technology Transfer and Innovation Support			Subject code	100.00
2.2 Course responsible / lecturer	Prof.dr.ing. Ovidiu Petru Stan – Ovidiu.stan@aut.utcluj.ro				
2.3 Teachers in charge of seminars / Laboratory / project	Prof.dr.ing. Ovidiu Petru Stan – Ovidiu.stan@aut.utcluj.ro				
2.4 Year of study	2	2.5 Semester	1	2.6 Type of assessment (E - exam, C - colloquium, V – verification)	E
2.7 Subject category	Formative category: DA – advanced, DS – speciality, DC – complementary				DC
	Optionality: DI – imposed, DO – optional (alternative), DF – optional (free choice)				DFac

3. Estimated total time

3.1 Number of hours per week	3	of which:	Course	2	Seminars	0	Laboratory	1	Project	0
3.2 Number of hours per semester	42	of which:	Course	28	Seminars	0	Laboratory	14	Project	0
3.3 Individual study:										
(a) Manual, lecture material and notes, bibliography										30
(b) Supplementary study in the library, online and in the field										20
(c) Preparation for seminars/laboratory works, homework, reports, portfolios, essays										26
(d) Tutoring										2
(e) Exams and tests										3
(f) Other activities:										0
3.4 Total hours of individual study (suma (3.3(a)...3.3(f)))					83					
3.5 Total hours per semester (3.2+3.4)					125					
3.6 Number of credit points					5					

4. Pre-requisites (where appropriate)

4.1 Curriculum	- Basic knowledge in project management
4.2 Competence	- Basic knowledge of PC operation

5. Requirements (where appropriate)

5.1. For the course	Classroom with, video projector, blackboard, Internet connection
5.2. For the applications	Laboratory attendance is mandatory.

6. Specific competence

6.1 Professional competences	• Interacts professionally in research and professional environments • Adjusts product designs • Ensures project management • Communicates scientific findings • Manage knowledge for strategic impact • Manages intellectual property rights • Promotes knowledge transfer
6.2 Cross competences	• Show initiative • Think analytically • Apply scientific, technological, and engineering knowledge • Work in teams

7. Expected Learning Outcomes

Knowledge	The student will know: • the principles of scientific ethics, academic integrity, and responsible management of research and experimental data • standards, best practices, and regulations for quality, safety, security, and ethical conduct in professional and research activities
Skills	The student will be able to: • manage projects, coordinate teams, develop professional networks, and promote open innovation and knowledge transfer • apply ethical principles, academic integrity, and responsible research practices in professional activities
Responsibilities and autonomy	• The student will be responsible for carrying out professional or research projects in compliance with quality, safety, and security standard

8. Discipline objective (as results from the *key competences gained*)

8.1 General objective	To equip students with a thorough understanding of innovation concepts, strategies, and best practices. The course will cover topics such as types of innovation, intellectual property, commercialization, and global innovation. Additionally, the course will aim to develop skills in areas such as innovation management, strategic thinking, problem-solving, and critical analysis that will be useful in their future careers. The course will also aim to provide students with the skills and knowledge to identify, evaluate, and develop new technologies, products, services, and business models. Ultimately, the goal of the course is to help students become effective and innovative leaders, managers and entrepreneurs in the ever-changing business and technology environments.
8.2 Specific objectives	The course aims to introduce students to the global dimensions of innovation, including internationalization and globalization. It will also provide students with the knowledge and skills necessary to develop a framework for innovation in a specific industry or sector. Additionally, the course will help students understand and appreciate the importance of innovation in the context of economic development and competitiveness. It will also help them develop skills in creativity, problem-solving, strategic thinking, and critical analysis, as well as understand the ethical and social responsibilities related to innovation.

9. Contents

9.1 Lectures	Hours	Teaching methods	Notes
Basic concepts and taxonomy of innovation (Innovation explained – Definition, Types and Meaning of Innovation)	2	Presentation and reading from course notes and references,	
Evolved concepts of innovation	2		
Innovation ecosystems and networks	2		

Open innovation and crowdsourcing	2	questions, and answers face-to-face and online, case studies.	
Innovation measurement and performance evaluation	2		
Technology Readiness Level vs Investment Readiness Level	2		
Use case. CIMIT - A framework for innovation in healthcare	2		
Complex Systems Innovation Fundamentals - Mindset, Process and Tools – part 1	2		
Complex Systems Innovation Fundamentals - Mindset, Process and Tools – part 2	2		
Intellectual property strategies and licensing	2		
Innovation policy and governance. Innovation commercialization and entrepreneurship	2		
Globalization of innovation and internationalization strategies	2		
01. Ethics and social responsibility in innovation. Models and Methods of 02. University Technology Transfer	2		
Innovation and digital transformation and Industry 4.0	2		
Bibliography:			
- Daniel Kim, Introduction to Systems Thinking, Pegasus Communications, https://thesystemsthinker.com/introduction-to-systems-thinking/ - Daniel Kim, Systems Thinking Tools, https://thesystemsthinker.com/systems-thinking-tools-a-users-reference-guide/ - Clayton M. Christensen, The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, HighBridge Audio, ISBN-13: 978-1565114159 - Henry Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology, Harvard Business Review Press, ISBN-13: 978-1422102831 - Alexander Osterwalder, Yves Pigneur, Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers, John Wiley and Sons, ISBN-10 : 9780470876411 - Geoffrey Moore, Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers, HarperBusiness, 2006, ISBN-10: 0060517123 - Eric Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, Crown Publishing Group, 2011, eISBN: 978-0-307-88791-7 W. Chan Kim, Renée Mauborgne, Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant, Gildan Audio and Blackstone Publishing, 2021, ISBN-13 : 979-8200566570 - Steve Blank, Bob Dorf, The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company, K&S Ranch, 2012, ISBN-13: 978-0984999309 - Adam B. Jaffe, Josh Lerner, Innovation and Its Discontents: How Our Broken Patent System is Endangering Innovation and Progress, and How to Fix It, Princeton University Press, 2007, ISBN-13: 978-0691127941 - Peter F. Drucker, Innovation and Entrepreneurship, Haper Business, 2006, - Carmine Gallo, The Innovation Secrets of Steve Jobs: Insanely Different Principles for Breakthrough Success, McGraw Hill, 2010, ISBN-13: 978-0071748759 - Nigel Cross, Design Thinking: Understanding How Designers Think and Work, Berg Publushers, 2011, ISBN-13: 978-1847886361 - Ovidiu Stan, Szilard Enyedi, Introducere in managementul proiectelor, U.T.PRESS, 2013, 978-973-662-811-5 - Iulia Clitan, Flavia Jascau, Vlad Muresan, Ovidiu Stan, Manualul profesorului pentru proiectarea cursurilor de antreprenoriat incluziv în învățământul superior, UTPRESS, 2022, 978-606-737-591-6 - Ovidiu Stan, Din sala de curs la o carieră de succes: o privire corespunzătoare asupra relației dintre educația furnizată de Universitatea Tehnică din Cluj Napoca și ocuparea forței de muncă, UTPRESS, 2022, 978-606-737-611-1 - Ovidiu Stan, Vlad Burnete, Stefan Cirstea, Denisa Stet, Tendinșe și evoluții emergente în universitățile tehnice, UTPRESS, 2022, 978-606-737-615-9			

9.2 Applications - Seminars/Laboratory/Project	Hours	Teaching methods	Notes
Generating new product and service ideas - Founder's Dream + The Deal	2	Documentation reading, presentation and exemplification, individual exercises on the computer, problem solving within a team.	
Application of creative thinking techniques to facilitate cooperation in innovative business development . Systems innovation tools	2		
Market segmentation	2		
Customer value proposition	2		
Financials and key value drivers	2		
Costumer discovery	2		
Pitch your Deck	2		
Bibliography			
• Daniel Kim, Introduction to Systems Thinking, Pegasus Communications, https://thesystemsthinker.com/introduction-to-systems-thinking/ • Daniel Kim, Systems Thinking Tools, https://thesystemsthinker.com/systems-thinking-tools-a-users-reference-guide/ • Clayton M. Christensen, The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail, HighBridge Audio, ISBN-13: 978-1565114159 • Henry Chesbrough, Open Innovation: The New Imperative for Creating and Profiting from Technology, Harvard Business Review Press, ISBN-13: 978-1422102831 • Alexander Osterwalder, Yves Pigneur, Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers, John Wiley and Sons, ISBN-10 : 9780470876411 • Geoffrey Moore, Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers, HarperBusiness, 2006, ISBN-10: 0060517123 • Eric Ries, The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses, Crown Publishing Group, 2011, eISBN: 978-0-307-88791-7 • W. Chan Kim, Renée Mauborgne, Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant, Gildan Audio and Blackstone Publishing, 2021, ISBN-13 : 979-8200566570 • Steve Blank, Bob Dorf, The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company, K&S Ranch, 2012, ISBN-13: 978-0984999309 • Adam B. Jaffe, Josh Lerner, Innovation and Its Discontents: How Our Broken Patent System is Endangering Innovation and Progress, and How to Fix It, Princeton University Press, 2007, ISBN-13: 978-0691127941 • Peter F. Drucker, Innovation and Entrepreneurship, Haper Business, 2006, • Carmine Gallo, The Innovation Secrets of Steve Jobs: Insanely Different Principles for Breakthrough Success, McGraw Hill, 2010, ISBN-13: 978-0071748759 • Nigel Cross, Design Thinking: Understanding How Designers Think and Work, Berg Publushers, 2011, ISBN-13: 978-1847886361 • Ovidiu Stan, Szilard Enyedi, Introducere in managementul proiectelor, U.T.PRESS, 2013, 978-973-662-811- • Iulia Clitan, Flavia Jascau, Vlad Muresan, Ovidiu Stan, Manualul profesorului pentru proiectarea cursurilor de antreprenoriat incluziv în învățământul superior, UTPRESS, 2022, 978-606-737-591-6 • Ovidiu Stan, Din sala de curs la o carieră de succes: o privire corespunzătoare asupra relației dintre educația furnizată de Universitatea Tehnică din Cluj Napoca și ocuparea forței de muncă, UTPRESS, 2022, 978-606-737-611-1 • Ovidiu Stan, Vlad Burnete, Stefan Cirstea, Denisa Stet, Tendinșe și evoluții emergente în universitățile tehnice, UTPRESS, 2022, 978-606-737-615-9			

**Se vor preciza, după caz: tematica seminariilor, lucrările de laborator, tematica și etapele proiectului.*

9. Bridging course contents with the expectations of the representatives of the community, professional associations and employers in the field

The course will also help students develop skills in creativity, problem-solving, strategic thinking, and critical analysis, which are highly valued by employers and professionals in the field of System Engineering. Additionally, the course will help students understand the ethical and social responsibilities related to innovation, which aligns with the expectations of the community and professional associations. Additionally, by introducing students to the global dimensions of

innovation, including internationalization and globalization, the course will help students understand the complexities and opportunities of the field in a global context.

10. Evaluation

Activity type	Assessment criteria	Assessment methods	Weight in the final grade
Course	Method of analysis, synthesis and integration of theoretical information	Exam	30%
Seminar	-	-	-
Laboratory	Method of analysis, synthesis and integration of theoretical information	Project	70%
Project	-	-	-
Minimum standard of performance: • Attend laboratory meetings and complete all assignments • Concurrent conditions for passing the exam ○ Minimum of 5 points from the exam ○ Minimum 5 points from project			

Date of filling in: 05.07.2026	Responsible	Title First name Last name	Signature
	Course	Prof.dr.eng. Ovidiu Petru Stan	
	Applications	Prof.dr.eng. Ovidiu Petru Stan	

Date of approval in the department of Automation _____	Head of department, Prof.dr.eng. Honoriu VĂLEAN
Date of approval in the Faculty of Automation and Computer Science Council _____	Dean, Prof.dr.eng. Vlad MUREȘAN