

Ivan Franko National University of Lviv
Radio Physics and Computer Technology Department

Think big. Start small. Scale Fast.

“Innovation & Entrepreneurship in IT” Course Syllabus

Name of the course: Innovation & Entrepreneurship in IT

Credits: 3.0 ECTS

Course language: English and Ukrainian

Course duration: 16 weeks (90h) – 1 lecture pre- two weeks, 1 lab pre- two weeks, team work, final project presentations (Zalik)

Technology focus: Web & Mobile Applications, Internet of Things, Smart sensors, Big Data, Business Software

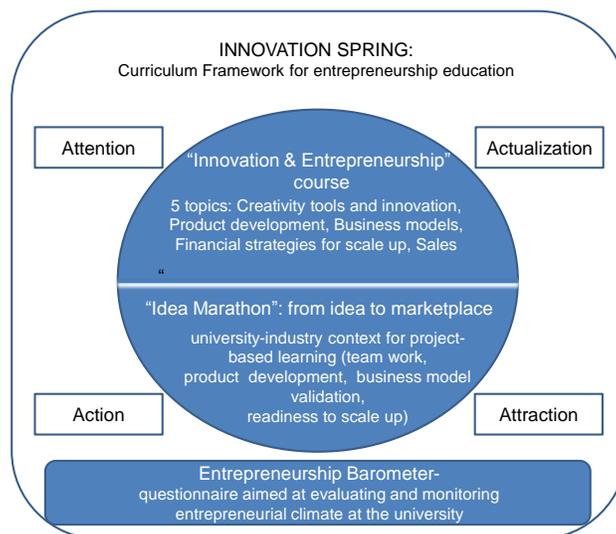
Methodology partners: UDL System, SoftServe

Location: General Tarnavsky Street, 107, 79017 Lviv, Ukraine

Dates: September 1 - December 25, 2021

COURSE ESSENCE

The course amounts to 3.0 ECTS credits in Bachelor’s degree and is called ‘Innovation and Entrepreneurship in IT’. The course focuses on building an overall entrepreneurial mindset and understanding. One example of this mindset is “not ask for a job, create one”. We strive to show the ‘emergence of seeding’ of a company, not only tell a story of venture capital and rapid scaling up, as popular press often tells about numerous startups. Equally important is to learn how to start a company with scarce resources. Therefore, during their studies, students are encouraged to choose and embark on an entrepreneurial journey «INNOVATION SPRING», and gradually pave this road along with their mates they have teamed up to accomplish this mission.



The 'Innovation and Entrepreneurship in IT' course combines practical and theoretical aspects of entrepreneurship. The theoretical parts are covered in a textbook and in some papers as well as introduced by the teacher during the lectures. The course consists of 5 topics (Creativity tools and innovation, Product development: prototype, validation and competitive advantage, Business models and startup teams, Financial strategies for Scaleup: venture capital and business angels, Marketing and sales). Each topic is followed by a guest lecture from a successful entrepreneur sharing his/her experiences from early phases of their entrepreneurship journey. The lecture - meeting is concluded by pitching practice: one representative from each students team delivers a pitch of a solution (technology, product) in front of the class and receives feedback from the teacher, guests- experienced entrepreneurs and students present there.

Idea Marathon – your Journey from Idea to the Market

Important competences of the innovator include the ability to:

1. comprehend the problems of people 'from the inside', from the position of these people (empathy);
2. understand that new problems worth solving are created as by-products of old solutions and contradictions;
3. understand the nature of the problem beyond the thinking of those who face this problem ("Problems cannot be solved with the same mindset that created them." – A. Einstein);
4. imagine an ideal solution.

These abilities allow an innovator to generate ideas, make assumptions to solve a real customer problem (need), select the 'right' approach and predict the outcome from business model.

'Idea Marathon' and startup pitching – these are the practical parts of the course, and together they form the University-Industry context for project-based learning where students actively chase problems and explore challenges, externalise creativity, generate ideas, use critical thinking, discover opportunities, acquire specific knowledge in business management, develop business models, collaborate, communicate, and learn how to form and lead startup teams. Students' teams are supervised by mentors from the industry.

"Entrepreneurship Barometer" is a questionnaire aimed at evaluating and monitoring entrepreneurial climate in course context, analysing the way students perceive their creativity level, synthesising the generalised attitude to entrepreneurship, identifying and evaluating the entrepreneurial intention, needs in specific knowledge and competences, current approaches and a context for practicing entrepreneurship.

LEARNING OUTCOMES AND BENEFITS

After taking the course, students will be able to:

Understand the role of entrepreneurship as well as skills set and mindset required for an entrepreneur's success;

Get greater recognition of the entrepreneur's figure, and reference to be an entrepreneur;

Assess and analyze entrepreneurship as a career choice

Prioritize problems, see opportunities in problems, generate and present creative ideas to solve them, apply creative thinking techniques in addressing their customers' needs;
Understand and plan innovation process using 'needs-approach-benefit-competition' model;
Understand where the idea for a startup come from;
Develop a comprehensive and highly scalable business model for startup by business models canvas;
Deal with various business financing mechanisms; understand how financial institutions operate in the investment market;
Learn how a startup is funded at its early stage and design the market entry strategy;
Efficiently work teams and define strategic partners for scale-up;
Prepare a demo pitch of a startup project.

STUDY METHODOLOGY

In order to act as an entrepreneur, course offer the following 4A approach (Attention, Actualisation, Attraction, Action), which is successfully applied for designing learning environments and journey toward creating a startup with elements of immersion and flow in analysing a situation and solving problems, when synthesising and evaluating solutions, acquiring new knowledge and skills, as well as forming a personal attitude to entrepreneurship and acting with velocity and agility.

Learning goes through the following four phases that correspond to the four stages of establishing a startup:

- Attention to the problem(s), which leads to irritation; and that irritation really stems from the fact that we strongly believe that something needs to be done very differently than how it is going on now, and this is viewed as an opportunity (on the one hand, a chance to solve this problem, and on the other hand, to commercialize the technology);
- Actualisation by goals and expected results: focus on a high-priority issue and conceptual solution for creating a new value;
- Attraction through the elaborated effective business model and formed unique team;
- Action to demonstrate the ability to meet customers' needs with implemented technology and developed product, and validate a business model, try to sell the product as soon as possible, and adjust the business strategy as needed.

The course sessions offer different types of study methods - lectures (30%), special sessions in other formats, like mentoring sessions, workshops/lab, panel discussions (30%), team work sessions (30%), and startup presentations (10%)

Throughout the course participants make part of and work in a team of 5 members.

COURSE OUTLINE

The course duration is 16 weeks. Each week students should spend about 5 hours to complete the course.

Besides the introductory section, the course contains the following sections:

Section 1. Attention- Identifying the Problem (01.09 - 14.09.2021)

Important competences of the innovator

A problem is a challenge that needs to be solved in order to meet the need

Section 2. Actualisation- Conceptual Solution (15.09 - 28.09.2021)

Innovation process

NABC approach in innovation process

Where did the initiative to start a company come from?

Section 3. Entrepreneur and entrepreneurship (29.09 - 12.10.2021)

Definition of Entrepreneur

What are the most important skills entrepreneurs need?

Role of Entrepreneurship

Section 4. Business models (13.10- 26.10.2021)

Business models

Business models canvas

Section 4. Value proposition and product communication (27.10 - 09.11.2021)

Lean Startup methodology

Value Proposition Canvas

Test your prototype/MVP

Section 5. Scale-up (10.11 - 23.11.2021)

Financing and performing at the initial stage

Funding: business angels or venture capital?

Section 6. Sell (24.11-07.12.2021)

Market Analysis and Plan

Storytelling – a tool in selling

Advice

Tech Startup Workshop 1. Project concept (13.10. - 14.12.2021)

Preparing and submitting a startup project concept

Tech Startup workshop is project-based e-Learning in Tech Startup context where students actively chase problems and explore challenges, externalise creativity, generate ideas, use critical thinking, discover opportunities, acquire specific knowledge in innovation management, develop prototype and business models, collaborate, communicate, and learn how to form and lead startup teams.

Students enter **the first phase (Attention)** when they get irritated that they cannot do their job, or cannot accomplish what they want, when they are dissatisfied with the state of things around, feel their own or someone else's *'pain'*, and they see it as a problem.

Assignment 1. Identifying the Problem.

Find something in your everyday life that 'annoys' you. *What is the real underlying issue you see in this situation? What contradiction do you observe? Can you use your creativity to imagine how everything should ideally be? What needs to be changed in the first place, and what hinders this? Who faces this problem first of all? How do you know that they would really like to have this problem solved? Are you really eager to solve this problem for this target group? Why do you feel passionate about this? Are you ready to dedicate time and effort to solve it right now?* - Students are asked to write answers to these questions in the box and submit for general review by all students.

To exit this phase successfully, every student has to formulate the question properly of *WHY* this problem exists in this target group, and *WHY* this problem has got into the field of their attention. Besides, students have to ask themselves: *Do I believe in my strength, am I able to assemble a team to solve this problem, and do I want to devote a part of my life to meet the needs of these clients?* If they feel that the answers to all these questions are positive, then they have every chance to succeed.

The second phase (Actualisation by a conceptual solution) deals with *HOW* students are going to solve the determined problem, and *HOW* the target group is going to behave exhibiting the need in the solution.

In this phase, we turn to the idea generation: finding an approach, technique, product that can demonstrate that the problem can be solved now; that is, it can meet the needs of one's defined customers. To search for alternative solutions, students are offered an interactive matrix as a way to think about problems, identify conflict situations and receive advice on the most likely solutions.

When ideas are generated, students in their teams discuss all the options and choose the most promising solutions that meet customers' needs and expectations. The solution to the problem must be more economical than living with this problem. Another key aspect is that the solution must be unique enough to provide a competitive edge. How do the solution and its advantages differ from what competitors offer?

Assignment 2. Defining Solution and Benefits.

Now you know who has the problem (set of problems) and what needs exist. *Can you use your own creativity to imagine some approach/solution to solve this problem and satisfy the needs? What value do you offer? Explain, what benefits will the potential customers get from using your approach? Are there any alternative approaches to solve this problem? Who are your competitors, and what are the advantages of your solution?* - Students are asked to create teams up to 5 persons each and write their team answers to these questions in the box.

The third phase is 'Attraction' (developing a business model). This practical part is built around the development and validation of a business model for a startup. Students can use the popular business model canvas outlined by A. Osterwalder, Y. Pigneur, and C. L. Tucci [7].

Students are advised to go out and talk to their potential customers about their approach, technology, and product. They have to think about the following questions: *What is your experience of communicating with potential customers about? If they think the idea is good, are*

they willing to pay the first check, which you give them very soon? Were they interested in any specific features of your product, and have they asked to add or remove something?

The task at this point is to model how their company will be organised. Moreover, the business model itself will be a value of their company; it can be one that differentiates them from their competitors and one that will attract customers and investors.

Students also need to consider the potential risks that they have to address in the business model description. By naming them here, students demonstrate their ability to deal with them (overcome or avoid them). Students should not be afraid of resistance; it will help them take off.

Then students are asked to try and sell their vision. As we know, investors today do not fund solutions that work – they fund business models that work. So a business model, not a solution, is the product to be developed in this phase.

Assignment 3. Developing a Business Model.

You already know who will be in your team, who will become your partner. *How can you distribute the created value to those who need it? Are those who use your value at the same time your customers? How much do you think the customers are willing to pay, and how? How will you work with your customers while they are using your product? How will you ‘develop’ your customers, what is the plan for expanding your business? What are the key activities? What is the cost of operating your business, and how will you receive revenue?* - Students should answer these questions in separate boxes, and the system will help with design of a business model.

The fourth phase (Action – project peer review and startup battle) is a set of actions that show that the business model works, that one is ready to sell a product and the customer is ready to buy it.

Assignment 4. Communication with potential clients

Go out and talk to your potential customers about your approach, technology, and product.

What is your experience of communicating with potential customers about? If they think the idea is good, are they willing to pay the first check, which you give them very soon? Were they interested in any specific features of your product, and have they asked to add or remove something?

Can you count on communicating with them in the future regarding your product?

Write your answers to these questions in the box.

Now students in a team have to develop a project concept for their startup and submit it for peer review using a special plugin, that is, the same grade is distributed among all students in a team based on peer ratings from students from other teams. Project concept should include: team description, the problem they focus on and needs of their target group, approach to meeting these needs, benefits for their target group when using such approach, their competitors and their advantages compared to them, business model (how they are going to collect money and find investor(s)), marketing plan and their scale-up strategy.

Once the teams have submitted assignments, every student has to provide feedback to 3 other students’ projects. Within this plugin a teacher can set up criteria (Table 1) for the Project Concept Evaluation.

Table 1. Criteria for the Project Concept Evaluation

#	Criteria for evaluation	0	1	2
1	Name, slogan, description of the team			
2	Problems, needs			
3	Idea, technology, solution			
4	Prototype; what has been done by the team to develop a solution to meet the needs			
5	Benefits, product scalability			
6	Market, target groups, loyalty programme			
7	Competitors; how your solution and its advantages differentiate you from competitors'			
8	Price, method of payment			
9	Validation of product through customer interviews (know exactly what they need, how much they are ready to pay and in which way)			
10	Marketing and fundraising plans			
11	Sale and revenue			
12	Production activity			
13	Cost – risk – partners			
	<i>TOTAL</i>			

Rating received by a project team is calculated as the average of each grade received, and in this case with 13 criteria, the maximum grade is 26.

The teacher gives students his/her option on their anonymous feedback and comments. When students provide feedback, the teacher assesses how specific, helpful, and kind such feedback is (the maximum grade is 14).

As a result, all students involved in the project submission and in the assessment process receive a total grade of up to 40, and each team receives more feedback. We can say that we have come to create a learning community.

Tech Startup Workshop 2. Startup battle- project presentations (15.12 - 22.12.2021)

During this phase students also need to develop and practise their skills in so-called 'elevator pitching', that is, they present very briefly, during the Startup Battle (through video conference) in front of the audience, the need, solution and benefit, business model and potential for scaling up – In order to receive instant feedback and recommendations from potential clients, partners, and investors.

The course wrap up (25.12.2021)

"Entrepreneurship Barometer"

Letter from the Future (Presentation- reflection: I am a successful entrepreneur. How I have achieved that)

GRADING

As you go through this course, you will be required to mark certain activities as complete.

A passing grade in this course is 51%.

ASSIGNMENT	PERCENT
Assessments: 1-4	40%
Project concept (peer-reviewing)	40%
Startup battle presentation (Zalik)	20%
Total	100%

READINGS

I. Katernyak, "Innovation Spring in Tech Startup: momentum to take off = "Інноваційна весна" в технологічних стартапах: моментум для злету" Підручник. Львів: Львівський національний університет імені Івана Франка, 2021. – 172 с.

I. Katernyak, V. Loboda, "Entrepreneurial Momentum for Sustainable Growth- Sustainable Organizations - Models, Applications, and New Perspectives, Jose C. Sánchez-García and Brizeida Hernández-Sánchez, IntechOpen, DOI: 10.5772/intechopen.95099. Available from: <https://www.intechopen.com/books/sustainable-organizations-models-applications-and-new-perspectives/entrepreneurial-momentum-for-sustainable-growth>

C. R. Carlson, W. W. Wilmot, "Innovation: The Five Disciplines for Creating What Customers Want", New York: Crown Business, 2006.

Ries, Eric (October 2011). "Creating the Lean Startup". Inc. 33 (8): 56–63.

M.Marmer, B. L. Herrmann, et al. "Startup Genome Report.A new framework for understanding why startups succeed", Startup Genome, 67 p., 2011.

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