MANAGEMENT OF SOFTWARE STARTUP PROJECTS

Syllabus

Requisites of the Course	
Cycle of Higher Education	*First cycle of higher education (bachelor's degree)*
Field of Study	*12 Information Technologies*
Speciality	*121 Software engineering*
Education Program	*Software Engineering of Multimedia and Information Retrieval Systems*
Type of Course	*Elective*
Mode of Studies	*full-time*
Year of studies, semester	*3 year (1 semester)*
ECTS workload	*4 credits (ECTS)., including 54 hours of classroom work, and 66 hours of self-study.*
Testing and assessment	*Final test*
Course Schedule	*http://rozklad.kpi.ua/*
Language of Instruction	*English*
Course Instructors	Lecturer: PhD, Associate Professor, Lesya Lyushenko, email LyushenkoL@gmail.com Teacher of practical work: PhD, Associate Professor, Lesya Lyushenko, email LyushenkoL@gmail.com
Access to the course	*MS Teams. Access to registered users.*MS Teams.

Outline of the Course

1. Course description, goals, objectives, and learning outcomes

The study of the discipline "Management of Startup Software Projects" allows students to form competencies that are necessary for solving practical problems of professional activities related to the management of startup software projects, namely: analyze stakeholder problems and software requirements, create business models, conduct marketing research, develop their own minimally working software information product (prototype), implement startup projects.

The purpose of studying the discipline "Management of Startup Software Projects" is to form the ability of students to systematically approach the creation of software innovative startups and mastering concepts, principles of management of innovative startups, as well as the formation of practical skills in working with and consumers of software products.
The subject of the *discipline "Management of Startup Software Projects" are methods, technologies and models that are used to create innovative software startups, implement management and their development.*

The study of the discipline "Management of startup software projects" contributes to the formation of general competencies (GC) among students, namely:
GC 01 Ability to abstract thinking, analysis and synthesis.
GC 03 Ability to communicate in the state language both orally and in writing.

GC 04 Ability to communicate in a foreign language both orally and in writing.
GC 05 Ability to learn and use modern knowledge.

*During the study of the discipline, applicants form professional **competencies (PC)** necessary for solving practical problems of professional activity related to project management for the development, implementation, improvement and operation of software information systems, namely:*
PC 01 Ability to identify, classify and formulate software requirements.
PC 08 Ability to apply fundamental and interdisciplinary knowledge to successfully solve software engineering problems..
PC 09 Ability to estimate and take into account economic, social, technological and environmental factors affecting the field of professional activity..
PC 10 Ability to accumulate, process and systematize professional knowledge about software creation and maintenance, and determination of the importance of lifelong learning.
PC 11 Ability to implement phases and iterations of the life cycle of the software systems and information technology based on appropriate models and approaches to software development..
PC 22 Ability to create innovative startup projects, calculate basic technical and economic indicators and develop business models of multimedia software and information retrieval systems innovative startup projects that have commercial potential for investment.

The study of the discipline "Management of Startup Software Projects" contributes to the formation of students' following programmatic learning outcomes (PLO) in the educational program:
PLO 01 To analyze, purposefully search and select the necessary information and reference resources and knowledge to solve professional problems, taking into account modern advances in science and technology.
PLO 02 To know the professional ethics code, understand the social significance and cultural aspects of software engineering and adhere to them in professional activities.
PLO 05 To know and apply relevant mathematical concepts, domain methods, system and object-oriented analysis and mathematical modeling for software development..
PLO09 To be able to use collecting, formulating and analyzing software requirements methods and tools..
PLO 10 To conduct a pre-project survey of the subject area, system analysis of the design object..
PLO 22 To know and be able to apply methods and tools of project management..
PLO 23 To be able to document and present the software development results.
PLO 24 To be able to calculate the software systems economic efficiency.
PLO 30 To know and to be able to develop business plans for investment projects of developing and implementing multimedia and information retrieval systems software that have commercial potential for investment..
PLO 33 To be able to organize a software product management complete cycle.
PLO 34 To be able to create innovative startup projects of designing multimedia and information-search systems software that have commercial potential for investment.
PLO 35 To be able to develop and analyze business models of innovative startup projects of developing multimedia and information retrieval systems software that have commercial potential for investment.
PLO 36 To be able to manage the creation and implementation of software projects in accordance with international standards.

2. Prerequisites and post-requisites of the course (the place of the course in the scheme of studies in accordance with curriculum)

Successful study of the discipline "Management of Startup Software Projects" is preceded by the study of disciplines "Components of software engineering", "Group Dynamics and Communications", "Fundamentals of Programming».

Theoretical knowledge and practical skills obtained during the assimilation of the discipline "Management of software startup projects" ensure the successful study of "Standardization and Technologies for Multimedia and Information Retrieval Software Products Development", the implementation of diploma design in the specialty 121 Software Engineering.

3. Content of the course

The discipline "Management of Startup Software Projects" involves the study of the following topics:

Topic 1. Introduction to innovative entrepreneurship

Topic 2. Business model

Topic 3. Consumer properties of the software product

Topic 4. Marketing and finance of startups

Topic 5. Work with stakeholders

Modular test work

Credit

4. Coursebooks and teaching resources

Basic reading:

1. *Alexander Osterwalder Yves Pigneur Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers (The Strategyzer series) Paperback, 2010. p.288*
2. *David Watson "Business Models: Investing in Companies and Sectors with Strong Competitive" Petersfield [England] : Harriman House Pub., 2005.p.279*
3. *Clayton M. Christensen "The Innovator's Dilemma : When New Technologies Cause Great Firms to Fail". Harvard Business Review Press, 2016. p.289*
4. *Allan Dib Page Marketing Plan Paperback Page Two 2018 232 p ISBN-10: 1989025013, ISBN-13: 978-1989025017*
5. *Kathrin Meier Mastering Corporate Life: A Guide to Serenity and Success at Work. River Grove Books. 2023: 244 p. ISBN: 1632996294*
6. *Nathan Furr, Jeff Dyer, Clayton M. Christensen The Innovator's Method: Bringing the Lean Start-up into Your Organization Harvard Business Review Press. 2014:288 p. ISBN-10: 9781625271464, ISBN-13: 978-1625271464*

Further reading:

7. *Basic rules for conducting a survey. ground-rules-for-interviewing.pdf (strategyzer.com)*
8. *Business Model template. Business Model Canvas – Download the Official Template (strategyzer.com)*
9. *Instructions for creating a business model. the-business-model-canvas-instruction-manual.pdf (strategyzer.com)*
10. *Value Proposal Template – https://www.strategyzer.com/canvas/value-proposition-canvas*
11. *Startup, entrepreneurship and business: what it is and what is the difference - https://thepage.ua/ua/experts/startap-pidpriyemnictvo-ta-biznes-sho-ce-take-i-v-chomu-riznicya*

12. *The best ideas for a startup in Ukraine in 2023 according to InVenture* [Найкращі ідеї для стартапу в Україні в 2022 за версією InVenture](#)
13. *Cards for creating a business model* [the-business-model-design-space-card-deck.pdf (strategyzer.com)](#)
14. *Check the business model* [. testing-your-business-model-a-reference-guide.pdf (strategyzer.com)](#)
15. *7 questions to check the business model –* [seven-questions-to-assess-your-business-model-design.pdf (strategyzer.com)](#)
16. *10 indicators of a good value proposition* [10-characteristics-of-great-value-propositions-checklist.pdf (strategyzer.com)](#)
17. *Loyalty and customer satisfaction.* [megamarketing.com.ua/loialnist-i-zadovolenist-kliienta/](#)
18. *Work with consumer experience.* [https://kromatic.com/blog/user-experience-is-not-a-feature/](#)

Educational content

5. Methods of mastering the discipline (educational component)

№	Type of training session Description	Description of the training session
Topic 1. Introduction to innovative entrepreneurship		
1	*Lecture No1 Introduction to innovative entrepreneurship. Basic concepts of startup software projects*	*The concept of innovative entrepreneurship, the path of development of startups, consumers and their problems*
2	*Lecture No2 Brainstorming (MS) on finding a solution. Purpose, methods and analysis of results*	*The purpose of the MS. MSh rules. MSh tools. Consolidation of ideas and analysis.*
3	*Workshop No1 Search for an idea for your own project*	*Using practical skills to find a segment of consumers, their problems. Choosing a priority consumer problem and planning its solution*
Topic 2. Business model		
4	*Lecture No3. Structure of business model and relationships (part 1) Lecture No3. Business Model and Relationship Structure (Part 2)*	*Business model of Alexander Osterwalder. Structure and connections between its parts. The biggest focus on the sections is Value Proposition, Consumer Segment, Consumer Interaction, and Revenue Streams.*
5	*Lecture No4. Development of a business model. (part 1)* *Lecture No4 Business model development. (part 2)*	*A change in the entire business model depending on the change in one of the key parameters of the business model. Planning of the sales market, price, level of technical support, incentive system.*
6	*Практикум №2. Побудова бізнес-моделі для власного стартап проекту програмного забезпечення*	*Build a business model for your own project. Explain the connections between parts of the model and justify the choice.*
Topic 3. Consumer properties of the software product		
7	*Lecture No5. Consumer properties of the project product*	*Consumer properties for working with customer satisfaction (Kano model) and with product development mods. Comparison of results*
8	*Lecture №6. Work with consumers*	*Definition of consumers for your project. Description of consumer differences. Consumer work, consumer pain*

		and consumer benefits. Making changes to the decision of the project.
9	Workshop number3. Stakeholder Concerns	Identify stakeholders and describe their main problems
10	Lecture 7. Identifying and strengthening competitive advantages	Determination of criteria for consumers' assessment of their problems. Comparing your solution with competing solutions. Identifying competitive advantages and ways to enhance these advantages.
11	Lecture No8. Conducting a consumer survey. Collection of requirements for the project product	Collection of requirements for the product proe kta. Formation of hypotheses on the project about consumers, solutions, value priorities of consumers. Setting goals for the survey. Generate survey questions
12	Workshop No4. Consumer properties and testing product hypotheses	Search for respondents (consumers). Conducting a survey. Consolidation of responses and analysis.
	Topic 4. Marketing and financestartups	
13	Lecture 9. Startup Marketing (Part 1) Lecture 9. Startup Marketing (Part 2)	Definition of the market. The market is global and the market is local. Evaluation of the sales market. Product modeling for penetration into adjacent markets.
14	Lecture 10. Financial model of sales of software projects	Choosing a financial modeland distributing the product. Performance appraisal. Formation of a loyalty system.
15	Workshop number5. Markets	Зробити опис основного ринку збуту та суміжних. Вибір та обґрунтування фінансової моделі отримання прибутку.
16	Lecture 11. Startup Finance	Formation of income stream. Revenue budget planning. Startup costs. One-time costs and periodic, production and non-production costs.
	Topic 5. Work with stakeholders	
17	Lecture No12 Working with stakeholders (part 1). Lecture No12Working with stakeholders (part 2).	Identifying stakeholders. Planning interactions with stakeholders. Business meeting. Creating a business proposal. Conducting presentations. Additional materials to enhance presentations.
18	Lecture No13. Creating presentations for stakeholders	Features of presentations depending on stakeholders. Purpose of the presentation. Plan your presentation. Presentation time, presentation content. Conducting a presentation. Answers to questions.
19	Workshop No6. Create a video presentation.	Develop a project presentation for the interested party (consumers, investors, partners). Make a video presentation.
	Modular test	
	Credit	

6. Self-study

Discipline "Management of Software Startup Projects" is based on independent preparation for classroom classes on theoretical and practical topics.

№	The name of the topic submitted for independent study	Hours	Literature
	Topic 1. Introduction to innovative entrepreneurship		

1	Lecture No1 Introduction to innovative entrepreneurship. Basic concepts.	1	1, 11, 12
2	Lecture No2 Brainstorming (MS) on finding a solution. Purpose, methods and analysis of results	1	1, 6, 12
3	Workshop No1 Search for an idea for your own project	4	6, 12
Topic 2. Business model			
4	Lecture No3. Business model structure and relationships (part 1)	1	2, 3, 4
5	Лекція №4. Моделювання бізнес-моделі. (частина 1)	1	3, 4, 13, 14
	Лекція №4. Моделювання бізнес-моделі. (частина 2)	1	13, 14, 17
6	Workshop No2. Building a business model for your own project	4	13, 14, 15, 16, 17
Topic 3. Consumer properties of the software product			
7	Lecture No5. Consumer properties of the project product	1	4, 5, 7, 18
8	Lecture No6. Work with consumers	1	6, 17, 18
9	Workshop No3. Stakeholder Concerns	4	3, 4, 6, 13, 14
10	Lecture No7. Identifying and strengthening competitive advantages	1	3,4, 9, 10
11	Lecture No8. Conducting a survey of consumers. Collection of requirements for the product aboute kta	1	6,9,
12	Workshop No4. Consumer properties and testing product hypotheses	4	8, 9, 11, 17,18
Topic 4. Marketing and Finance of startups			
15	Lecture 9. Startup Marketing (Part 1)	1	3, 4, 6
	Lecture 9. Startup Marketing (Part 2)	1	3, 4, 6
16	Lecture 10. Financial model of sales of software projects	1	6, 13, 14
17	Workshop number 5. Sales markets	4	6
18	Lecture 11. Startup Finance	1	
Topic 5. Work with stakeholders			
20	Lecture No12 Working with stakeholders (part 1).	1	6, 16,17,18
	Lecture No1 2 Working with stakeholders (part 2).	1	6, 17,18
21	Lecture No13. Creating presentations for stakeholders	1	6, 10, 11, 12
22	Workshop number 6. Create a video presentation.	4	1-18
	Modulna test	10	1-18
	Credit	15	1-18

Politics and control

7. Policy of the discipline (educational component)

Attendance of lectures is mandatory.

Attendance at computer workshop classes can be episodic and, if necessary, consultation/defense of computer workshops.

Rules of conduct in the classroom: activity, respect for those present, disconnection of phones.

Adherence to the policy of academic integrity.

Rules for the protection of computer workshops: work must be done in accordance with the tasks and in accordance with the option, in accordance with the requirements.

8. Types of control and rating system for evaluating learning outcomes

During the semester, students perform 5 workshops. The maximum number of points for each computer workshop: 16 points. The execution of all computer workshops is mandatory for obtaining a test.

Points are awarded for:
- quality of computer workshop: 0-10 points;
- answer during the protection of the computer workshop: 0-3 points;
- timely presentation of work to the defense: 0-3 points.

Criteria for assessing the quality of performance:
10 points – the work was performed efficiently, in full;
7-9 points – the work is performed efficiently, in full, but has drawbacks;
3-6 points – the work is completed in full, but contains minor errors;
2 pointsu – the work is completed in full, but contains significant errors;
0 points – the work was not completed in full.

Criteria for evaluating the answer:
3 points – the answer is complete, well-reasoned;
2 points – the answer is correct, but has flaws or minor errors;
1 point – there are significant errors in the answer;
0 points – no answer or the answer is incorrect.

Criteria for assessing the timeliness of the submission of work to the defense:
3 points – the work is submitted to the defense no later than the specified period;
0 points – the work is submitted to the defense later than the specified period.

The maximum number of points for the implementation and protection of computer workshops:
16 points × 5 comp. pract. = 80 points.
During the semester, lectures are given surveys on the topic of the current lesson. The maximum number of points for all surveys: 3 points. The number of surveys on the topic of the current lesson for one student is unlimited.
*The task for **a modular test** consists of 1 theoreticale and 1 practical forquestions. The answer to each question is estimated at 10 points.*

Criteria for evaluating each test question:
9-10 points – the answer is correct, complete, well-reasoned;
7-8 points – the answer is correct, detailed, but not very well reasoned;
5-6 points – in general, the answer is correct, but has drawbacks;
3-4 points – there are minor errors in the answer;
1-2 points – there are significant errors in the answer;
0 points – no answer or the answer is incorrect.

The maximum number of points for a modular test:
10 points × 2 questionsь = 20 points.

The rating scale for the discipline is equal to:
R = RC = 80 points + 20 points = 100 points.

Calendar control: it is carried outtwice a semester as a monitoring of the current state of fulfillment of the requirements of the syllabus.
At the first certification (8th week), the student receives "enrolled" if his current rating is at least1-6 points (50% of the maximum number of points that a student can receive before the first certification).
At the second certification (14th week), the student receives "enrolled" if his current rating is at least 30 points (50% of the maximum number of points that a student can receive before the second certification).

Semester control: credit

Conditions of admission to semester control:

With a semester rating (R_C) of at least 60 points and enrollment of all works of the computer workshop, the student receives a credit "automatic" in accordance with the table (Table of correspondence of rating points to grades on a university scale). Otherwise, he must perform a test paper.

A necessary condition for admission to the test work is the implementation and protection of a computer workshop.

If a student does not agree with the grade "automatic", he may try to increase his grade by writing a test paper, while his points received for the semester are preserved, and of the two marks received by the student, the best ("soft" grading system is set).

Table of correspondence of rating points to assessments on a university scale:

Score	*Score*
100-95	Perfectly
94-85	Very good
84-75	Well
74-65	Satisfactory
64-60	Enough
Less than 60	Disappointing
Admission conditions not met	Not allowed

Additional information on the discipline (educational component)

The list of questions submitted for semester control is provided in Appendix 1.

Work program of the discipline (syllabus):

Compiled by Candidate of Technical Sciences, Associate Professor, L.A. Liushenko

Adopted by Computer Systems Software Department (protocol № 8 from 25.01.23)

Approved by the Faculty Board of Methodology (protocol № 6 from 27.01.23)

Annex 1. The list of questions that are submitted for semester control

1. How does a startup differ from an existing business?

1. Assign a business model
2. The concept of innovative entrepreneurship
3. Brainstorming tools. Consolidation of ideas and analysis.
4. Using practical skills to find a segment of consumers
5. Choosing a priority consumer problem and planning its solution
6. Business model structure
7. Features of software startups
8. How can you develop a business model
9. What is a value proposition
10. What is customer satisfaction
11. How to determine the most important consumer properties
12. How to identify stakeholders
13. How to determine competitive advantages
14. How to strengthen competitive advantages
15. Formation of hypotheses for the project
16. Why are consumer surveys conducted?
17. What types of questions are better suited for analyzing survey results
18. What indicators of the sales market are important for the investor
19. How to choose a financial model for generating income
20. What are the costs in the business model
21. At what stage of the project is it advisable to prepare a presentation
22. What should the presentation contain for the interested party