Національний технічний університет України
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ
імені ІГОРЯ СІКОРСЬКОГО»

Department emblem (if any)

Department of ComputerScience

AGILE SOFTWARE DEVELOPMENT METHODOLOGY

Work programme of the academic discipline (Silabus)

Details of the discipline	
Level of higher education	*First (bachelor's) degree*

Field of expertise	*12 Information technology*
Speciality.	*123 Computer engineering*
Educational programme	*Computer systems and networks*
Status of the discipline	*Selective*
Form of study	*full-time/extra-mural*
Year of study, semester	*3rd year, autumn semester*
Scope of the discipline	*4 credits/120 hours*
Semester control / control measures	*ICR credit*
Class schedule	*//rozklad.kpi.ua*
Language of instruction	*Ukrainian*
Information about the course leader / lecturers	Lecturer: *Assistant Shevelo O.P. alex.*shevelo@gmail.com Laboratory: assistant *Shevelo O.P. alex.*shevelo@gmail.com
Course location	https://comsys.kpi.ua

Programme of the discipline

1. Description of the discipline, its purpose, subject matter and learning outcomes

The purpose of teaching the discipline is to acquire the knowledge, skills and abilities necessary for a specialist who specialises in the development and design of modern software, especially backend.

The objectives of the discipline are:

– Introduction to the concepts and basic approaches to designing modern software;
– studying the principles and methods of choosing methodologies for a specific task;
– familiarisation with the organisation and methodology of organising the work of development teams.

As a result of studying the discipline, the student must:

Know:

– How development is currently organised in teams;

– How to carry out tailoring correctly and what it is for;
– The full scope of elements that are included in the term "agile methodology" in the development of modern software;
– Principles of risk management.

Be able to:
– understand how to choose agile methodologies for software development;
– determine the optimal methodology depending on the project.

2. Prerequisites and post-requisites of the discipline (place in the structural and logical scheme of study for the relevant educational programme)

Required subjects: "Programming", "Object-oriented programming", "System programming", "Data structures and algorithms", "Software engineering", "Algorithms and methods of computing"

Disciplines that are based on the learning outcomes of this discipline: "System software", "Computer systems"

3. Content of the discipline

Section 1. The concept of "agile"
Topic 1.1. Definition of "agile"
Topic 1.2 Key system elements that influence the choice of "agile"
Topic 1.3. Requirements for the selected methodologies to prevent the project from reaching a dead end

Section 2. Methods of system analysis
Topic 2.1 . System description schemes and their types
Topic 2.2. Risk analysis and Trade-of analysis

Section 3. Working with requirements
Topic 3.1. What are requirements, their types and why is it important
Topic 3.2. Methods of obtaining requirements
Topic 3.3. Methods of requirements verification

Chapter 4. An overview of the most popular AGILE methods.
Topic 4.1: Waterfall.
Topic 4.2. SCRUM.
Topic 4.3. CANBAN.
Topic 4.4. Other options.

Chapter 5. Options for further development and support of the project
Topic 5.1. How to avoid a dead end by choosing the wrong methodology
Topic 5.2. Refactoring/reengineering/optimisation and the technologies required for them

4. Training materials and resources.

Basic:

1. Pierre Bourque, Richard Fairley, Guide to the Software Engineering Body of Knowledge, Version 3.0 SW
2. Richard E. Fairley, Managing and Leading Software Projects
3. I. Sommerville, Software Engineering, 10th ed., Addison-Wesley, 2016
4. K.E. Wiegers, Software Requirements, 3rd ed.

Additional:

1. 1. Richard E. Fairley, Managing and Leading Software Projects
2. Robert C. Martin, Clean Code: A Handbook of Agile Software Craftsmanship

Educational content

5. Methods of mastering the discipline (educational component)

Full-time education

Titles of sections and topics	Number of hours			
	Total	Including.		
		Lectures	Laboratory classes	SRS
Section 1. The concept of "agile" Topic 1.1. Definition of "agile" Topic 1.2 Key system elements that influence the choice of "agile" Topic 1.3. Requirements for the selected methodologies to prevent the project from reaching a dead end	16	4	2	10
Section 2. Methods of system analysis Topic 2.1. System description schemes and their types Topic 2.2. Risk analysis and Trade-of analysis	18	6	4	8
Section 3. Working with requirements Topic 3.1. What are requirements, their types and why is it important Topic 3.2. Methods of obtaining requirements Topic 3.3. Methods of requirements verification	20	6	2	12
Chapter 4. An overview of the most popular AGILE methods. Topic 4.1: Waterfall. Topic 4.2. SCRUM. Topic 4.3. CANBAN. Topic 4.4. Other options.	36	12	8	16
Chapter 5. Options for further development and support of the project Topic 5.1. How to avoid a dead end by choosing the wrong methodology Topic 5.2. Refactoring/reengineering/optimisation and the	12	5	2	5

technologies required for them				
ICR	6	1		5
Credit	12	2		10
Together	**120**	**36**	**18**	**66**

Part-time study

Titles of sections and topics	Number of hours			
	Total	Including.		
		Lectures	Laboratory classes	SRS
Section 1. The concept of "agile" Topic 1.1. Definition of "agile" Topic 1.2: The main elements of the system that influence the choice of "agile" Topic 1.3. Requirements for the selected methodologies to prevent the project from reaching a dead end	14	1	1	12
Section 2. Methods of system analysis Topic 2.1. System description schemes and their types Topic 2.2. Risk analysis and Trade-of analysis	14	1	1	12
Section 3. Working with requirements Topic 3.1. What are requirements, their types and why is it important Topic 3.2. Methods of obtaining requirements Topic 3.3. Methods of requirements verification	14	1	1	12
Chapter 4. An overview of the most popular AGILE methods. Topic 4.1: Waterfall. Topic 4.2. SCRUM. Topic 4.3. CANBAN. Topic 4.4. Other options.	34	2	4	28
Chapter 5. Options for further development and support of the project Topic 5.1. How to avoid a dead end by choosing the wrong methodology Topic 5.2. Refactoring/reengineering/optimisation and the technologies required for them	26	1	1	24
ICR	6	1		5
Credit	12	1		11
Together	**120**	**8**	**8**	**104**

The purpose of the cycle of laboratory work is to provide students with the necessary practical skills in using the AGILE software development methodology.

Full-time education

№	Name of the laboratory work	Number of audit hours
1	Choosing a project topic and initial requirements for it	2
2	Main diagrams and charts of the project	6
3	Choosing a project organisation methodology	6
4	Project risk management	4

Part-time study

№	Name of the laboratory work	Number of audit hours
1	Choosing a project topic and initial requirements for it	2
2	Main diagrams and charts of the project	2
3	Choosing a project organisation methodology	2
4	Project risk management	2
	Together	8

6. Independent work of the student

Preparation for laboratory classes 18 hours. Preparation for module tests 8 hours. Preparation for the test 10 hours.

Policy and control

7. Policy of the discipline (educational component)

During classes, students must adhere to certain disciplinary rules:
1) It is forbidden to be late for classes;
2) at the entrance of the teacher, as a sign of greeting, students of Igor Sikorsky Kyiv Polytechnic Institute must stand up;
3) no unauthorised conversations or other noise that interferes with the conduct of classes are allowed;
4) leaving the classroom during the class is allowed only with the permission of the teacher.
5) it is not allowed to use mobile phones and other technical means without the permission of the teacher.
Laboratory works are submitted in person with a preliminary check of theoretical knowledge required to perform the laboratory work. The practical results are checked by checking the code and performing test tasks.
In the process of studying, the teacher has the right to award up to 5 reward points for early completion of laboratory work, for the creative approach shown in the performance of individual assignment or for active participation in the discussion of issues related to the topic of the lecture or practical class.
The teacher may assign up to 5 penalty points for completing and submitting a laboratory work after the deadline, for a significant number of missed classes, or for violating the rules of conduct in class.

8. Types of control and rating system for assessing learning outcomes (RSO)

- Ongoing control: laboratory work
- Calendar control: completing a module test

is conducted twice a semester as a monitoring of the current state of implementation of the silaBus requirements.

Semester control: credit

Conditions for admission to the semester control: semester rating of more than 40 points.

The assessment of certain types of academic work performed by the student is carried out in points:

View educational work	Mach number of points	Total number of points
Performing and defending laboratory work 1	15	**85**
Performing and defending laboratory work 2	20	
Performing and defending laboratory work 3	25	
Performing and defending laboratory work 4	25	
Performing a modular control work		**15**
Together		**100**
Credit (optional) 30		

Table of correspondence between rating points and grades on the university scale:

Number of points	*Assessment.*
100-95	Excellent
94-85	Very good
84-75	Good.
74-65	Satisfactory
64-60	Enough is enough
Less than 60	Unsatisfactory
The conditions for admission are not met	Not allowed

9. Additional information on the discipline (educational component)

the list of theoretical issues to be submitted for semester control is given in Appendix 1

A condition for receiving extra points.

As part of the study of the discipline ≪AGILE software development methodology≫ it is allowed to credit points obtained as a result of distance learning courses at Coursera platform, subject to prior approval of the course programme by the by a teacher and upon receipt of an official certificate.

Work programme of the discipline (syllabus):

Compiled by Assistant of the Department of Computer Science, Shevelo O.P.

Approved by the Department of Computer Science (Minutes No. 10 of 25.05.2022)

Approved by the Methodological Commission of the Faculty (Minutes No. 10 of 09.06.2022)

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