



Risk and Quality Management of Projects (Syllabus)

Details of the academic discipline

Cycle of Higher Education	<i>First cycle of higher education (Bachelor's degree)</i>
Branch of Knowledge	<i>12 Information technologies</i>
Speciality	<i>121 Software engineering</i>
Educational Program	<i>Computer Systems Software Engineering</i>
Type of Course	<i>Normative</i>
Mode of Studies	<i>Full-time</i>
Year of Studies, Semester	<i>Third year, second semester</i>
ECTS Workload	<i>4,5 credits, Time allotment—135 hours, including 54 hours of classroom work, and 81 hours of self-study.</i>
Testing and Assessment	<i>Exam</i>
Course Schedule	<i>According to the schedule for the second semester of the current academic year at the link roz.kpi.ua</i>
Language of Instruction	<i>English</i>
Course Instructors	<i>Professor, Dr. Sc. Yuri Gordienko, yuri.gordienko@gmail.com Teaching assistant Maksym Shulha, shulha.maksym@iit.kpi.ua</i>
Access to the Course	<i>Online lectures: https://bbb.comsys.kpi.ua/b/mak-pvp-sjt-56k Resources: https://classroom.google.com/c/NTYyNzAwODU0NzI3?cjc=xir62eb</i>

Outline of the Course

1. Course description, goals, objectives and learning outcomes

The **goal** of the course is for students to receive thorough training in theoretical, methodological and practical foundations in project management methodologies, understanding the project life cycle, developing project plans and ensuring their implementation, managing risks and resources, organizing teamwork, using tools and making decisions.

The **objective** of the course is the methods and approaches used in project management, the use of tools to facilitate project management, project resource planning, project risk management, and project documentation.

The **learning outcomes** of the course are:

- gaining an immersive understanding of the practices and skills needed to succeed in an entry-level project management role;
- understanding the project life cycle and the meaning of each phase;
- defining and creating measurable project goals and outcomes;

- learning how to create effective project documentation and artifacts throughout the various phases of a project:
 - creating risk management plans;
 - understanding process improvement techniques;
 - managing escalations, team dynamics, and stakeholders;
 - creating budgets and navigating procurement;
- practicing strategic communication, problem-solving, and stakeholder management through real-world scenarios.

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

When studying this discipline, students' knowledge of the following disciplines is used: "Group Dynamics and Communications," "Software Engineering Components."

The knowledge gained by students while studying the discipline is used in the following disciplines: "Pre-diploma Practice," "Diploma Design."

3. Content of the course

Module 1. Foundations of Project Management

- Topic 1.1. Embarking on a career in project management
- Topic 1.2. Becoming an effective project manager
- Topic 1.3. Project management life cycle and methodologies
- Topic 1.4. Organizational structure and culture

Module 2. Project Initiation

- Topic 2.1. Fundamentals of project initiation
- Topic 2.2. Defining project goals, scope, and success criteria
- Topic 2.3. Working effectively with stakeholders
- Topic 2.4. Utilizing resources and tools for project success

Module 3. Project Planning

- Topic 3.1. Beginning the planning phase
- Topic 3.2. Building a project plan
- Topic 3.3. Managing budgeting and procurement
- Topic 3.4. Managing risks effectively
- Topic 3.5. Organizing communication and documentation

Module 4. Project Execution

- Topic 4.1. Introduction to project execution
- Topic 4.2. Quality management and continuous improvement
- Topic 4.3. Data-informed decision-making
- Topic 4.4. Leadership and influencing skills
- Topic 4.5. Effective project communication. Closing a project

4. Coursebooks and teaching resources

Main:

1. A Guide to the Project Management Body of Knowledge (PMBOK® Guide) [Text]. – Ed. 5. – Project Management Institute, 2013. – 590 p.

2. PMI. (2017). Project Management Job Growth and Talent Gap 2017–2027. <https://www.pmi.org/learning/careers/job-growth>.
3. P2M «Program & Project Management for Enterprise Innovation». Project Management Association of Japan, 2016. // [Electronic resource]. – URL: http://www.pmai.or.jp/ENG/p2m/p2m_guide/p2m_guide.html.
4. What Is Scrum Methodology? // [Electronic resource]. – URL: <https://www.digite.com/agile/scrum-methodology/>.
5. DeMarco, T., Lister, T. Peopleware: Productive projects and teams // Second Edition, 2017.
6. Todd C. Williams Rescue the Problem Project: A Complete Guide to Identifying, Preventing, and Recovering from Project Failure, 2017.
7. PMI. // [Electronic resource]. – URL: <https://www.pmi.org/>.
8. Schwaber, K., & Sutherland, J. (2020). The 2020 Scrum Guide. // [Electronic resource]. – URL: <https://scrumguides.org/scrum-guide.html>.

Additional:

1. Coblands Consulting. Reducing Project Management Risk Principles. // [Electronic resource]. – URL: <http://www.netcomuk.co.uk/rtusler/>.
2. Glossary of Project Management Terms. // [Electronic resource]. – URL: <http://www.uc.edu/sashtml/orpm/chapa/index.htm>.
3. Kim Heldman Project Management JumpStart, 2016.
4. Jack Ferraro Project Management for Non-Project Managers, 2017.

Equipment needed for classes

Lecture classes are held in a classroom equipped with a projector, laboratory classes are held in a computer laboratory. Distance learning requires Internet access and video conferencing software and hardware.

Educational Content

5. Methodology.

<i>Names of modules, topics</i>	<i>Distribution of study time</i>				
	<i>Total</i>	<i>including</i>			
		<i>Lectures</i>	<i>Practical (seminar) classes</i>	<i>Laboratory work (computer workshop)</i>	<i>SS</i>
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
Module 1. Foundations of Project Management					
Topic 1.1. Embarking on a career in project management	4	2			2
Topic 1.2. Becoming an effective project manager	9	2		2	5
Topic 1.3. Project management life cycle and methodologies	4	2			2

1	2	3	4	5	6
Topic 1.4. Organizational structure and culture	4	2			2
Total by module 1	21	8	0	2	11
Module 2. Project Initiation					
Topic 2.1. Fundamentals of project initiation	7	2		1	4
Topic 2.2. Defining project goals, scope, and success criteria	8	2		2	4
Topic 2.3. Working effectively with stakeholders	11	2		3	6
Topic 2.4. Utilizing resources and tools for project success	4	2			2
Total by module 2	30	8	0	6	16
Module 3. Project Planning					
Topic 3.1. Beginning the planning phase	9	2		2	5
Topic 3.2. Building a project plan	9	2		1	6
Topic 3.3. Managing budgeting and procurement	11	2		3	6
Topic 3.4. Managing risks effectively	8	2			6
Topic 3.5. Organizing communication and documentation	4	2			2
Total by module 3	41	10	0	6	25
Module 4. Project Execution					
Topic 4.1. Introduction to project execution	7	2		1	4
Topic 4.2. Quality management and continuous improvement	4	2			2
Topic 4.3. Data-informed decision-making	9	2		2	5
Topic 4.4. Leadership and influencing skills	4	2			2
Topic 4.5. Effective project communication. Closing a project	7	2		1	4
Total by module 4	31	10	0	4	17
Modular control work	6				6
Exam	6				6
Total by semester	135	36	0	18	81

Lectures

#	<i>The name of the topic of the lecture and a list of main questions (a list of didactic tools, references to the literature and tasks on the SRS)</i>
1	2
1	<p>Topic 1.1. Embarking on a career in project management Learn how the course is structured, what project management is and what a project manager does, how to apply your skills from previous experience to project management roles, what types of project management roles you could pursue after completing this course, and how to search for those positions.</p>
2	<p>Topic 1.2. Becoming an effective project manager Learn how project managers add value to organizations and to their teams, what the role and responsibilities of a project manager entail, and what core skills a project manager needs to be successful.</p>
3	<p>Topic 1.3. Project management life cycle and methodologies Learn the phases of the project life cycle, what tasks they involve, and why it is important to complete them. Learn the different project management methodologies and approaches and which is most effective for a given project.</p>
4	<p>Topic 1.4. Organizational structure and culture Learn common organizational structures and how they impact project management, how organizational culture impacts project management, and how a project manager contributes to the change management process.</p>
5	<p>Topic 2.1. Fundamentals of project initiation Understand the significance of a project's initiation phase and describe its key components, and understand how to determine a project's benefits and costs.</p>
6	<p>Topic 2.2. Defining project goals, scope, and success criteria Learn how to define and create measurable project goals and deliverables; how to define project scope, differentiate among tasks that are in-scope and out-of-scope, and avoid scope creep; and how to define and measure a project's success criteria.</p>
7	<p>Topic 2.3. Working effectively with stakeholders Learn how to define project roles and responsibilities, complete a stakeholder analysis, and utilize RACI charts to define and communicate project team member responsibilities.</p>
8	<p>Topic 2.4. Utilizing resources and tools for project success Learn the typical resources needed to manage a project, recognize the importance of clear and consistent project documentation, understand the key components of project proposals and charters and develop a project charter, and evaluate various project management tools to meet project needs.</p>
9	<p>Topic 3.1. Beginning the planning phase Learn the benefits of planning and key components of the planning phase, the difference between tasks and milestones, and how to set milestones.</p>

1	2
10	<p>Topic 3.2. Building a project plan Learn why a project plan is necessary and what components it contains, how to create accurate time estimates and why they are important, and which tools and best practices to use to build a project plan.</p>
11	<p>Topic 3.3. Managing budgeting and procurement Learn what the components of a project budget are, how the budgeting process works, and how to manage a project budget. Explore how the procurement process works, what documentation is necessary, and how to obtain support and avoid ethical conflicts during the process.</p>
12	<p>Topic 3.4. Managing risks effectively Learn what risk management is and how it can help prevent project failure, what tools can help identify and manage risks, how to identify different types of risks and measure their impact on a project, and how to use a risk management plan to communicate and resolve risks.</p>
13	<p>Topic 3.5. Organizing communication and documentation Learn the elements of a simple communication plan and how to draft and manage one, why documentation helps create project team visibility and accountability, how to organize documents in one central place, and how to prepare for a job search by documenting experience and highlighting transferable skills.</p>
14	<p>Topic 4.1. Introduction to project execution Learn what aspects of a project to track, and how to track them, how to effectively manage changes, dependencies, and risks and how to communicate critical risks to stakeholders.</p>
15	<p>Topic 4.2. Quality management and continuous improvement Learn how to manage quality using various techniques, how to effectively communicate with customers and different ways to measure customer satisfaction; continuous improvement and process improvement techniques and how to conduct a retrospective during the project to improve processes.</p>
16	<p>Topic 4.3. Data-informed decision-making Learn the value of gathering data, how to prioritize data to meet project needs, and how to use data to inform your decision-making; how to explain your project data to stakeholders and team members using effective visuals and presentation techniques.</p>
17	<p>Topic 4.4. Leadership and influencing skills Learn the factors that influence team effectiveness, the stages of team development, and how to manage team dynamics; how to create an ethical and inclusive environment in which high-functioning teams work together to achieve project goals; how to use different techniques and sources of power to influence others.</p>
18	<p>Topic 4.5. Effective project communication. Closing a project Learn what tools provide effective project team communication, how to organize and facilitate meetings to ensure project success, and how to effectively communicate project status updates to project stakeholders and team members; how to determine when a project is finished and why closing a project is important, the steps of the closing process and how to create and share project closing documentation.</p>

Laboratory works

#	The name of the laboratory work	Number of classroom hours
1	2	3
1	Becoming an effective project manager (Module 1, Topic 1.2)	2
2	Starting a successful project (Module 2, Topic 2.1, 2.2)	3
3	Working effectively with stakeholders (Module 2, Topic 2.3)	3
4	Building a project plan (Module 3, Topic 3.1, 3.2)	3
5	Managing budgeting and procurement (Module 3, Topic 3.3)	3
6	Project execution (Module 4, Topic 4.1, 4.3, 4.5)	4
	Total:	18

6. Self-study

During completing individual tasks, students must consolidate the knowledge acquired during lectures and laboratory works, independently study specific topics, and deepen their knowledge for further study. Students' self-study consists of the following:

- preparation for the lecture classes by studying the material discussed in the previous lecture classes;
- preparation for laboratory classes by performing laboratory works with the study of theoretical issues that are considered in lecture classes;
- drawing up a protocol with the results of laboratory work.

Policy and Assessment

7. Course policy

All students must attend lectures and laboratory classes—both during offline learning (physically attending classes in classrooms) and distance learning (virtual attendance of online classes).

During classes, students must follow certain disciplinary rules:

- it is forbidden to be late for classes;
- extraneous conversations or other noise that interferes with classes are not allowed;
- leaving the classroom during the lesson is allowed only with the teacher's permission.
- the usage of mobile phones and other technical means is not allowed without the teacher's permission.

The results of laboratory works must be submitted in electronic format in the form of report files. Such files must contain the results of the relevant tasks and meet the requirements and methodological guidelines for each work.

Works that are submitted after a deadline without valid reason will be assigned a lower score.

All written work is checked for plagiarism. Plagiarism significantly reduces the score, and significant borrowing of someone else's text can lead to an unsatisfactory assessment of the work.

Laboratory works are performed by teams. Each team consists of no more than 3 (three) students. Students are divided into teams by themselves during the first 2 (two) weeks of study, then students who did not form teams will be randomly assigned to teams.

8. Monitoring and Grading Policy

The student's final overall score (R_D) consists of the points received for:

- laboratory works (R_{LAB});
- tests (R_T);
- modular control work (R_{MCW});
- exam (R_E).

According to the ["Regulations on the system of evaluation of learning outcomes in Igor Sikorsky KPI,"](#) approved by Order #1/273 dated September 14, 2020, a rating system type RSO-2 is used, for which the rating consists of:

- initial score (R_C)—assessment of activities during the semester: $R_C = (R_{LAB} + R_T + R_{MCW}) \times 0.6$;
- exam score (R_E).

Thus, $R_D = R_C + R_E$.

During the course, students submit 6 (six) laboratory works, 8 (eight) tests and modular control work.

Calculation of evaluation scales

Evaluation scale (maximum possible evaluation) of laboratory work: 8 points.

Evaluation scale of all laboratory works: $R_{LAB} = 8 \times 6 = 48$ points.

Evaluation scale (maximum possible evaluation) of test: 4 points.

Evaluation scale of all tests: $R_T = 4 \times 8 = 32$ points.

Evaluation scale of modular control work: $R_{MCW} = 20$ points.

Evaluation scale of initial score: $R_C = (R_{LAB} + R_T + R_{MCW}) \times 0.6 = (48 + 32 + 20) \times 0.6 = 60$ points.

Evaluation scale of exam: $R_E = 40$ points.

Overall evaluation scale: $R_D = R_C + R_E = 60 + 40 = 100$ points.

The minimum possible positive overall score: $R_{MIN} = 0.6 \times 100 = 60$ points.

Deadlines for submission of works

The deadline for submitting laboratory works and modular control work is determined as follows:

- laboratory work 1—from the 3rd (third) to the 8th (eighth) week of study, inclusive;
- laboratory work 2—from the 5th (fifth) to the 10th (tenth) week of study, inclusive;
- laboratory work 3—from the 7th (seventh) to the 12th (twelfth) week of study, inclusive;
- laboratory work 4—from the 9th (ninth) to the 14th (fourteenth) week of study, inclusive;
- laboratory work 5—from the 11th (eleventh) to the 16th (sixteenth) week of study, inclusive;
- laboratory work 6—from the 13th (thirteenth) to the 18th (eighteenth) week of study, inclusive;
- modular control work—up to and including the 18th (eighteenth) week of study.

The deadline for taking the tests is determined as:

- the time of the end of the class on which the test is held, in the case of offline learning;
- 2 (two) days after the day of the class on which the test is held, in the case of distance learning.

Encouraging and penalty points

Laboratory works and tests that are submitted after the deadline without valid reason are assessed a half of the maximum possible score.

Laboratory works that are submitted before the start of the submission period are assessed an encouraging 2 (two) points in addition to the maximum possible evaluation.

Determination of the conditions for obtaining a positive result of calendar control

Calendar control usually is carried out on the 8th and 15th weeks of study. A necessary condition for obtaining a positive result of the calendar control is a certain value of the student's current score (R_{C1} , R_{C2}), which is not less than some minimum value (R_{MINK1} , R_{MINK2}), respectively, for the first and second calendar control. The minimum value for obtaining a positive result of the calendar control is defined as 60% of the maximum possible evaluation of R_C at the time of the calendar control. That is, when submitting works according to the specified deadlines, 1 (one) laboratory work and 4 (four) tests must be submitted at the date of the first calendar control, and 4 (four) laboratory works and 7 (seven) tests must be submitted at the date of the second calendar control.

Thus:

- $R_{C1} = 1 \times 6 + 4 \times 4 = 24$ points;
- $R_{C2} = 4 \times 6 + 7 \times 4 = 60$ points;
- $R_{MINK1} = 24 \times 0.6 = 14.4$ points;
- $R_{MINK2} = 60 \times 0.6 = 36$ points.

That is, to obtain a positive result of the first calendar control, it is necessary to get at least 14.4 points, for the second calendar control—60 points.

Determination of conditions for admission to the exam

The condition for admission to the exam is the submission of the required number of tasks during the course with a certain level of success, as well as compliance with the requirements of academic integrity, which are described in the [Code of Honor of the National Technical University of Ukraine "Ihor Sikorsky Kyiv Polytechnic Institute,"](#) adopted by the Decision of the Academic Council dated April 5, 2021 (Protocol #4). That is, during the course, the student must get some non-zero starting rating ($R_C > 0$), submit a modular control work, at least 3 (three) laboratory works and at least 4 (four) tests.

The minimum starting rating for admission to the exam (R_{MINADM}) is defined as 60% of the minimum possible positive overall score (R_{MIN}). Hence the value of $R_{MINADM} = R_{MIN} \times 0.6 = 60 \times 0.6 = 36$ points. Thus, the condition for admission to the exam will be $R_C \geq R_{MINADM}$, that is, the value of the initial score R_C must be at least 36 points.

The final overall score is converted into a score on the university scale.

Table of translation of the final overall score to the university evaluation score

<i>Final overall score R_D</i>	<i>University evaluation score</i>
95...100	Excellent
85...94	Very Good
75...84	Good
65...74	Satisfactory
60...64	Sufficient
36...59	Fail
0...35	Not Admitted

Syllabus of the Course

Designed by teaching assistant Maksym Shulha

Adopted by Department of Computing Engineering (protocol #10 dated May 25, 2022)

Approved by Faculty Board of Methodology (protocol #10 dated June 9, 2022)