

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL TECHNICAL UNIVERSITY
«KHARKIV POLYTECHNIC INSTITUTE»

METHODOLOGICAL GUIDELINES
for the student's self-study
in the discipline "Riskology"
for students in the specialty D3 "Management"

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INTRODUCTION

Risk management has become a core component of modern management theory and practice due to the growing complexity, uncertainty, and interdependence of contemporary business environments. Organizations operate in conditions characterized by technological change, globalization, regulatory pressure, financial volatility, and social and environmental challenges. In such context, risk is an inherent attribute of managerial decision-making.

Understanding of risks makes it possible for organizations to anticipate potential threats and opportunities, reduce negative consequences, ensure continuity of operation, and support sustainable development. For managers, understanding risk is essential for strategic planning, operational control, financial stability, and stakeholder trust.

Therefore, the Riskology course provides a theoretical and practical foundation for identifying, analyzing, evaluating, and managing risks in different areas of enterprise activity. Studying riskology equips future managers with analytical tools and critical thinking skills necessary for informed decision-making under uncertainty.

Self-study plays a crucial role in learning management concepts and methods. Lectures and workshops provide initial knowledge, but independent work allows students to deepen theoretical understanding, develop practical skills, and apply risk management tools to real-world cases. Through self-study, students improve their ability to analyze complex situations, interpret quantitative and qualitative data, perform risk assessment, and propose managerial solutions.

These guidelines are designed to support students in structured self-study of riskology topics, promote deeper understanding of risk management principles, and facilitate the development of analytical and practical competencies required for effective managerial practice.

The plan for self-study follows the theoretical part of the course, consisting of eight topics that cover the main basic areas of risk-related decision making and best practices in management:

1. Introduction to riskology
2. Business risk
3. Risk types and their features
4. Methods of risk management
5. Risk measurement and metrics
6. Uncertainty in business risk assessment
7. Enterprise activities and corresponding risks
8. Sustainability and risk management

COURSE STRUCTURE AND TASKS FOR THE SELF-STUDY

Topic 1. Introduction to Riskology

Concepts of risk and risk management. Methods of risk management. Riskology's relationship with management. Risk management functions.

Questions to answer:

1. What is risk and risk management?
2. Explain the evolution of riskology as a scientific field.
3. What is the difference between risk, hazard, and uncertainty?
4. What are the main objectives of risk management?
5. How does riskology relate to general management theory?
6. What management functions are affected by risk?
7. What is the role of risk management in strategic planning?
8. Compare proactive and reactive approaches to risk management.
9. What is risk culture in an organization?
10. What role does top management play in risk management?
11. How does risk management support decision-making?
12. What are the consequences of ignoring risk management in organizations?

Task:

Analyze any real organization and identify at least five risks affecting its management functions (planning, organizing, motivating, controlling). Explain how each risk influences managerial decisions. Use the template below (Table 1).

Table 1 – Influence of risk on managerial decisions.

Risk	Influence			
	Planning	Organizing	Motivating	Controlling
1.				
2.				
3.				
4.				
5.				

Topic 2. Business Risk

Definition of business risk. Sources of risk. Key areas influenced by risk. Ideas of risk transfer and avoidance. Elements of risk. Characteristics of risks.

Questions to answer:

1. What is business risk?
2. What are the main components of business risk?
3. What are internal sources of business risk?
4. What are external sources of business risk?
5. Which business areas are most influenced by risk?
6. What is risk transfer and avoidance?
7. What are the elements of a risk event?
8. What characteristics are common for business risks?
9. How does risk affect profitability and competitiveness?
10. What is risk exposure in business operations?
11. How does diversification reduce business risk?
12. How does innovation influence business risk?

Task:

Analyze one recent global crisis (economic, geopolitical, pandemic) and describe how it changed business risk profiles in at least two industries. Specify external and internal sources of risk in each situation.

Topic 3. Risk Types and Their Features

Types of business risk: strategic, operational, financial, compliance, and reputational risk. Internal vs. external risks. Pure vs. speculative risks. Risks by scale and time. Risks of business activities. Justified vs. unjustified risk.

Questions to answer:

1. What is strategic risk?
2. What is operational risk?
3. What is financial risk?

4. What is compliance risk?
5. What is reputational risk?
6. What are internal vs. external risks?
7. What are pure risks?
8. What are speculative risks?
9. Classify risks by time horizon and scale.
10. How are risks classified by business activity?
11. What is justified risk?
12. Why is risk classification important for management decisions?

Task:

Choose a real business case and classify its risks into strategic, operational, financial, compliance, and reputational categories. Provide justification for each one.

Use the template below (Table 2), put “+” into the corresponding columns.

Table 2 – Classification of company’s risks

Risk	Type				Comments
	Strategic	Operational	Compliance	Reputational	
1.					
2.					
3.					
4.					
5.					
...					

Topic 4. Methods of Risk Management

Risk avoidance. Risk reduction (prevention and mitigation). Risk retention (acceptance). Risk transfer (insurance, outsourcing, contracts). Active vs. passive risk management. Preventive vs. reactive methods. Organizational and economic methods of risk management. Risk diversification as a management tool. Role of insurance in risk management.

Questions to answer:

1. What is risk avoidance, and when is it feasible?
2. What is risk reduction through prevention?
3. What is risk mitigation?
4. What is risk retention?
5. What is risk transfer?
6. How does insurance function as a risk transfer tool?
7. How does outsourcing transfer risk?
8. What is the difference between active and passive risk management?
9. What are reactive risk management methods?
10. What are the main organizational methods of risk management?
11. How does risk diversification reduce overall risk?
12. What are the downsides of risk avoidance?

Task:

Analyze how insurance, outsourcing, and contracts can be used to transfer risks in a chosen industry (manufacturing, transportation, agriculture, IT, etc.). Find out what are the best practices regarding risk management in the industry. Use websites of companies, industry analytics, scientific research papers, and news media to find evidence of risk management methods.

Topic 5. Risk Measurement and Metrics

Qualitative vs. quantitative risk assessment. Probability and impact as core risk parameters. Risk exposure and expected loss. Risk assessment tools. Ranking and prioritization of risks. Key risk indicators. Thresholds, limits, and risk tolerance. Basic statistical measures used in risk assessment.

Questions to answer:

1. What is the difference between qualitative and quantitative risk assessment?
2. How do managers use probability as a risk parameter?

3. Explain impact (severity) as a risk parameter.
4. What is risk exposure?
5. What is the expected loss?
6. What are risk matrices and heat maps in risk management?
7. How are risks ranked and prioritized?
8. What are the risk thresholds and limits?
9. What is risk appetite? How is it different from risk tolerance?
10. How are statistical measures used in risk assessment?
11. What are the limitations of quantitative risk models?
12. How to create a good risk measurement system?

Task:

Construct a risk matrix for a small project (e.g., launching a product, organizing an event) and rank risks by probability and impact. Use the template below (Table 3) to place the risk into the corresponding cells. Formulate possible actions to mitigate or avoid the risks.

Table 3 – Risk matrix template

		Impact →				
		Very low	Low	Moderate	High	Severe
Likelihood ↑	Very likely					
	Likely					
	Possible					
	Unlikely					
	Very unlikely					

Topic 6. Uncertainty in Business Risk Assessment

Difference between risk and uncertainty. Types of uncertainty. Sources of uncertainty in business environments. Information asymmetry and incomplete data. Subjectivity and behavioral biases in risk perception. Scenario analysis and alternatives analysis for decision making.

Questions to answer:

1. What is the difference between risk and uncertainty?
2. What are the types of uncertainty?
3. What are the sources of uncertainty in business environments?
4. What is information asymmetry?
5. How does incomplete data affect risk assessment?
6. What is subjectivity in risk perception?
7. What are behavioral and cognitive biases in decision-making? List the biases you know.
8. What are the heuristics in risk judgment?
9. What is scenario and alternative analysis?
10. How do deterministic and probabilistic decision models differ?
11. What is the role of expert judgment in uncertainty?
12. How does uncertainty influence strategic planning?

Task:

Remember your favorite book, movie or TV series that included a managerial decision made under uncertainty.

Analyze the decision and identify types and sources of uncertainty involved.

What were the consequences of the risk events?

Can such decision be made in a real-life company?

What exactly were not realistic about the fictional situation?

Prepare notes about this example to be discussed during the practical class.

Topic 7. Enterprise Activities and Corresponding Risks

Origins of risk in companies. Production and operational risks. Financial activity risks. Marketing and sales risks. Supply chain and logistics risks. Human resource risks. Innovation and project risks. Legal and compliance risks. Information and technological risks. Interdependence of risks across business functions. Business strategies and risk management practices. Risk management standards.

Questions to answer:

1. What are production and operational risks?
2. What are financial activity risks?
3. What are marketing and sales risks?
4. What are supply chain and logistics risks?
5. What are human resource management risks?
6. What are innovation and project risks?
7. What are legal and compliance risks?
8. What are information and technological risks?
9. How are risks interdependent across business functions?
10. How does business strategy affect risk profile?
11. What is enterprise risk management (ERM)?
12. What are risk management standards such as ISO 31000 and COSO ERM?

Task:

Read the ISO 31000 or COSO ERM reviews (see the links in the recommended literature list [9, 10]) and summarize key principles of enterprise risk management in a structured outline or a mind map. Use diagrams and flowcharts to illustrate and support the logic of the analyzed frameworks.

What are the differences between them?

Can they be used together or interchangeably?

Topic 8. Sustainability and Risk Management

Environmental, social, and governance risks. Climate risk. Sustainable risk management. Regulatory and reputational implications. Ethics of risk management.

Questions to answer:

1. What are risk governance structures in companies?
2. How effective is integrated risk management in enterprises?
3. What are ESG risks?
4. What are environmental risks in business?
5. What are social risks in organizations?
6. What is sustainable risk management?
7. What are reputational risks related to sustainability?
8. What are the ethical issues in risk management?
9. What are stakeholder expectations regarding sustainability?
10. How does sustainable finance influence risk management?
11. How is risk disclosed in sustainability reporting?

Task:

Write an essay (2-3 pages) on potential financial and reputational consequences of ESG risks in a particular industry. Discuss possible views and existing trends in that industry.

QUESTIONS FOR THE PREPARATION FOR THE FINAL CONTROL

1. Risk and its role in management.
2. Risk management objectives in organizations.
3. Differences between risk, hazard, and uncertainty.
4. Functions of risk management in strategic planning.
5. Proactive vs. reactive approaches to managing risk.
6. Business risk: internal and external sources.
7. Key areas of business operations influenced by risk.
8. Risk transfer methods including insurance, contracts, and outsourcing.
9. Limitations and feasibility of risk avoidance strategies.
10. Elements of a risk event: cause, event, and consequence.
11. Characteristics of pure and speculative risks.
12. Strategic, operational, financial, compliance, and reputational risk.
13. Classification of risks by internal vs. external, scale, time horizon, and business activity.
14. Justified vs. unjustified risk and its implications for decision-making
15. Methods of risk management: avoidance, reduction, retention, and transfer.
16. Active vs. passive risk management approaches.
17. Preventive and reactive methods in organizational and economic risk management.
18. Risk diversification as a management tool.
19. Role of insurance in mitigating business risks.
20. Qualitative and quantitative risk assessment approaches.
21. Probability, impact, and expected loss as core risk metrics.
22. Risk exposure and ranking/prioritization of risks.
23. Risk thresholds, limits, and risk tolerance.
24. Scenario analysis and alternative analysis under uncertainty.
25. Information asymmetry and incomplete data in business risk assessment.

26. Behavioral biases affecting managerial risk perception.
27. Deterministic vs. probabilistic decision models in risk assessment.
28. Origins of risk for production, finance, marketing, HR, IT.
29. Interdependence of risks across business functions.
30. Enterprise risk management (ERM) principles and standards
31. COSO ERM framework and its role in modern risk management
32. Risk governance structures in organizations.
33. Environmental, social, and governance (ESG) risks.
34. Climate risks: physical and transition impacts.
35. Regulatory, ethical, and reputational implications of sustainability risks.
36. Sustainable risk management principles and their application.
37. Risk disclosure and reporting in sustainability frameworks.
38. Integration of risk management into business strategy for long-term value creation.
39. Examples of systematic vs. unsystematic risks in global business.
40. Evaluation of risk management effectiveness.

RECOMMENDED LITERATURE

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