Module Layout
ERM503 Risk Management & Risk Management Standards

Faculty	FEM FSS	FACULTY OF ECONOMICS AND MANAGEMENT FACULTY OF SOCIAL SCIENCES		
Programme of Study	ERM	MASTER IN ENTERPRISE RISK MANAGEMENT		
Module	ERM503	Risk Management and Risk Management Standards		
Level	**Undergraduate**	**Graduate**		
		Master	***Doctoral***	
		√ *(Διαπανεπιστημιακό)*		
Language of Instruction	ENGLISH			
Teaching Method	DISTANCE LEARNING			
Module Type	***Mandatory***	***Optional***		
	√			
Number of Cohort Tutorial Meetings	***Total***	***Physical Presence***	***Web conferences***	
	10	*0*	*10*	
Number of Exercises	-			
Number of Assignments	*4*			
Final Grade Calculation	***Exercises***	***Assignments***	***Final Exams***	
	-	*30* **%**	*70***%**	
Number of European Credit Transfer System (ECTS)	*20*			

Module Description

The objective of this module is to serve as an introduction to enterprise risk management and international risk management standards. The topics covered in this module are grouped into five parts as follows: the first part is about *Key concepts in risk management*, in which students are introduced the concept of risk, uncertainty, volatility and correlation their relation to risk management and the basics of a generic risk management process. The second part is about *international risk management standards*, where three international standards are covered: the ISO 31000:2009, the COSO ERM Framework, and the IRGC framework. The third part is dedicated to special risk management topics, namely risk communication, risk governance and culture and risk financing. The fourth part is dedicated to *applications of risk management* application which are presented via a number of case studies in enterprise risk management. The fifth part is focused on skills development for a number of risk assessment techniques, including diagrammatic, quantitative and hybrid methodologies for risk analysis and assessment.

Module Prerequisites	

Final Grade Composition			
Assessment Method	**Percentage on Overall Grade**	**Workload**	
		Hours	**ECTS**
Weekly Study (32 weeks *15 hours of study)	0 %	~480~515	16
Assignment 1	7.5 %	30	1
Assignment 2	7.5 %	30	1
Assignment 3	7.5 %	30	1
Assignment 4	7.5 %	30	1
Final Exam	70.0 %	3	0
Total	**100%**	**~600~635**	**20**

Grading Policies and Evaluation Methods

- Students are evaluated with 10, if they collect 100% of the possible grade. Students are evaluated with 9, if they collect 90% of the possible grade, meaning, 90%*10=9, etc.
- Students have to submit four written assignments in each module. Students have the right not to submit one written assignment. In order for a student to be able to participate in the final examination he/she should have gathered a total of at least 20 points from all of his/her submitted written assignments.
- The average is calculated as a simple average of the 4 written assignments. The average grade of the written assignments is worth 30% of the final grade and is valid only for students who have successfully passed the final exam. The rest 70% of the total module grade is obtained from the final exam.

Main Competencies that needs to be developed

After completing this module students will be able to do the following:

- Understand the main concepts of risk management – risks, crises, disasters, uncertainty
- Understand and apply the main stepwise process for applying risk management
- Understand and apply techniques of risk identification and assessment
- Understand key features of international risk management standards and frameworks, and their

differences
- Recognize and analyze applications of risk management
- Understand the variety of contexts in which risk management can be successfully applied.
- Formulate and apply risk management to a given situation

Intended Learning Outcomes

After course completion, students will be able to:

Knowledge
- Define risk, risk management
- Identify different risk types
- Identify risk management applications
- Identify risk treatment strategies

Comprehension
- Distinguish and classify different risk types
- Compare risk management processes
- Compare risk management strategies
- Compare risks assessments
- Discuss risk management, risk applications and related concepts
- Explain basic risk management concepts and processes
- Review risk management literature

Application
- Apply risk techniques
- Apply or use risk management in an organizational context
- Communicate risks and risk management

Analysis
- Create visual assessments and analyses of risk
- Distinguish among different risks
- Categorize and prioritize risks

Synthesis
- Assemble information for performing risk assessment
- Design risk treatment strategies
- Design and construct enterprise risk portfolios
- Oversee, organize or manage risk management processes

Evaluation
- Choose risk treatment strategies
- Assess, compare and validate risk management processes

Bibliography

1. Alexander, D., 2002. *Principles of emergency planning and management*. Oxford University Press.
2. Borek, A., 2014. *Total information risk management: maximizing the value of data and information assets*, Elsevier, Morgan Kaufmann, Amsterdam ; Boston.
3. Borge, D., 2001. *The book of risk.* Wiley, New York.

4. Borghesi, A., Gaudenzi, B., 2013. *Risk management: how to assess, transfer, and communicate critical risks*. Springer, Milan ; New York.
5. Carroll, R. (Ed.), 2009. *Risk management handbook for health care organizations*. Jossey-Bass, San Francisco.
6. Dallas, M., 2006. *Value and risk management: a guide to best practice*. Blackwell Publishing..
7. FERMA, 2003, *A Risk Management Standard, Federation of European Risk Management Associations, Brussels*, Belgium. Available online at http://www.ferma.eu/risk-management/standards/risk-management-standard/
8. FERMA, 2010, *A structured approach to Enterprise Risk Management and the requirements of ISO 31000*, Federation of European Risk Management Associations, Brussels, Belgium. Available online at http://www.ferma.eu/risk-management/standards/iso-standard/
9. Fraser, J., Simkins, B.J. (Eds.), 2010. *Enterprise risk management*. Wiley, Hoboken, N.J.
10. International Risk Governance Council, 2014. *An introduction to the IRGC Risk Governance Framework*. Available online from www.irgc.org
11. Ishikawa, A., & Tsujimoto, A. (2009). *Risk and Crisis Management : 101 Cases*. World Scientific Publishing Company.
12. ISO/IEC 31000:2009 Risk Management, International Organization for Standardization, Geneva, Switzerland.
13. ISO/IEC 31010:2009 Risk Management – Risk assessment techniques, International Organization for Standardization, Geneva, Switzerland.
14. Lam, J., 2014. *Enterprise risk management: from incentives to controls*, 2nd Ed. Wiley.
15. Lund, M.S., Solhaug, B., Stølen, K., 2010. *Model-driven risk analysis: the CORAS approach*. Springer, Berlin ; London ; New York.
16. Merna, T., & Al-Thani, F. F. (2008). *Corporate Risk Management*. Wiley.
17. Moeller, R.R., 2011. *COSO enterprise risk management: establishing effective governance, risk, and compliance processes*, 2nd ed., Wiley, Hoboken, N.J.
18. Moran, A., 2014. *Agile risk management, Springer briefs in computer science*. Springer, New York.
19. Müller, R., Wittmer, A., Drax, C. (Eds.), 2014. *Aviation risk and safety management: methods and applications in aviation organizations*. Springer, New York.
20. Munier, N., 2014. *Risk management for engineering projects: procedures, methods and tools*. Springer, New York.
21. Olson, D.L., Wu, D.D., 2010. *Enterprise risk management models*. Springer, Heidelberg.
22. Parnell, G.S., Bresnick, T.A., Tani, S.N., Johnson, E.R., 2013. *Handbook of decision analysis*, John Wiley & Sons, Hoboken, N.J.
23. Pritchard, C.L., 2001. *Risk management: concepts and guidance*, 2nd ed. ESI International.
24. Renn, O., Walker, K. (Eds.), 2008. *Global risk governance: concept and practice using the IRGC framework*. Springer, Dordrecht.
25. Segal, S., 2011. *Corporate value of enterprise risk management: the next step in business management*, Wiley, Hoboken, N.J.

Additional reading

Students are encouraged to use any relevant material of academic or professional origin they can get hold of, since the field is constantly growing and evolving into new domains.

The following list of additional reading material is meant only as a starting point, and is by no means exhaustive – not even close.

1. American Institute of Chemical Engineers (Ed.), 2001. *Layer of protection analysis: simplified process risk assessment*, Center for Chemical Process Safety of the American Institute of

Chemical Engineers, New York.
2. D'Addario, F.J., 2013. *Influencing enterprise risk mitigation*. Elsevier, Oxford; Waltham, MA.
3. Frenkel, M., Hommel, U., Rudolf, M. (Eds.), 2005. *Risk management: challenge and opportunity*, 2nd ed. Springer, Berlin ; New York.
4. Garvey, P.R., 2009. *Analytical methods for risk management: a systems engineering perspective*,. CRC Press, Boca Raton.
5. Honey, G., 2009. *A short guide to reputation risk*. Gower, Farnham, Surrey ; Burlington, VT.
6. Ishikawa, A., Naka, I., 2007. *Knowledge management and risk strategies*. World Scientific, Hackensack, NJ.
7. Klüppelberg, C., Straub, D., Welpe, I. (Eds.), 2014. *Risk -- a multidisciplinary introduction*. Springer, Cham ; New York.
8. Labuszewski, J. (Ed.), 2010. *The CME group risk management handbook: products and applications*, Wiley, Hoboken, N.J.
9. Linkov, I., Wenning, R.J., Kiker, G.A., 2007. *Managing critical infrastructure risks decision tools and applications for port security*. Springer Verlag, Dordrecht, the Netherlands.
10. McNeil, A.J., Frey, R., Embrechts, P., 2005. *Quantitative risk management: concepts, techniques and tools*, Princeton University Press, Princeton, N.J.
11. Moeller, R.R., 2007. *COSO enterprise risk management: understanding the new integrated ERM framework*. John Wiley & Sons, Hoboken, N.J.
12. Pinkowski, J. (Ed.), 2008. *Disaster management handbook, Public administration and public policy*. CRC Press, Boca Raton.
13. Solozhentsev, E.D., Komarov, Y.V., 2014. *Risk management technologies: with logic and probabilistic models*. Springer, Dordrecht [etc.].
14. Ziemba, R., Ziemba, W.T., 2007. *Scenarios for risk management and global investment strategies*. John Wiley & Sons, Chichester, England ; Hoboken, NJ.

Associations and websites

1. Federation of European Risk Management Associations - http://www.ferma.eu
2. The Professional Risk Managers' International Association - http://www.prmia.org
3. Institute of Risk Management – http://www.theirm.org
4. International Risk Management Institute, Inc. – http://www.irmi.com

STUDY SCHEDULE			
Week	***Learning Outcomes***	***Educational Activities***	***Estimated student work time (in hours)***
1	Understanding of key concepts in risk management Understanding of perceptions and utility in risk management Module sections to be covered: 1 Introduction to Risk Management 1.1 Key concepts 1.1.1 Introduction to risk management 1.1.2 Beliefs and Preferences	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time
2	Understanding of complexity in risk management, correlation and volatility. Module sections to be covered: 1.1.3 Volatility and Correlation	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***1st Group Advisory Meeting***	• ≈14hrs study time • ≈2hrs 1st Group advisory meeting
3	Identification and content of main risk treatment strategies Understanding the risk management process Module sections to be covered: 1.2 Risk treatment strategies 1.3 Risk management process	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time

4	Identification and context of various risk types, using alternative taxonomies for identifying and classifying risks. Module sections to be covered: 1.4 Risks types	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time
5	Understanding of the relationship(s) between risk, crisis and emergency planning Acquire knowledge about the evolution of risk management as a discipline. Module sections to be covered: 1.5 Risks Vs Crises, Vs Disasters 1.6 Risk Management evolution	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time
6	Key concepts in the ISO risk management standard Module sections to be covered: 2 Risk Management Standards 2.1 ISO	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***1st Written Assignment is announced*** • ***1st Teleconference***	• ≈14hrs study time • ≈2hrs *1st* teleconference
7	Knowledge about key concepts in the COSO enterprise risk management framework Module sections to be covered: 2.2 COSO enterprise risk management framework	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time • ≈10hrs for written assignment

8	Knowledge about key concepts in the IRGC risk management framework Module sections to be covered: 2.3 IRGC risk management framework	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time • ≈10hrs for written assignment
9	Understanding of the role of risk communication Understanding of the role of risk governance Understanding of the role of risk financing Module sections to be covered: 3 Special topics in risk management 3.1 Risk communication 3.2 Risk Governance and Culture 3.3 Risk Financing	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***1st WA is due***	• ≈14hrs study time • ≈10hrs for written assignment
10	Knowledge about the applicability of risk management in various areas. Students should be able to identify the common elements of risk management and its process across the applications studied. Module sections to be covered: 4 Risk Management Cases and Applications 4.1 Illustrative cases 4.1.1 Project management risk management case study 4.1.2 Aviation risk management case study 4.1.3 Software Development risk management case study	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***2nd Group Advisory Meeting*** • ***2nd Written Assignment is announced***	• ≈14hrs study time • ≈2hrs 2nd Group Advisory Meeting

11	Knowledge about the applicability of risk management in various areas. Students should be able to identify the common elements of risk management and its process across the applications studied. Module sections to be covered: 4.1.4 Social Events risk management case study 4.1.5 Pharmaceutical risk management case study 4.1.6 Refinery risk management case study	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***2nd Teleconference***	• ≈14hrs study time • ≈2hrs 2nd Teleconference • ≈10hrs for Written Assignment
12-13		*Christmas Holidays*	
14	Knowledge about the applicability of risk management in various areas. Students should be able to identify the common elements of risk management and its process across the applications studied. Module sections to be covered: 4.1.7 Holistic-Strategic risk management case study 4.1.8 Shareholders risk management case study 4.1.9 Supply Chain risk management case study	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time • ≈10hrs for Written Assignment

15	Knowledge about the IRGC framework applicability in various. In particular case studies in (a) food industry, (b) conflict management (c) energy security. Students should be able to identify the common elements of risk management and its process across the applications studied. Module sections to be covered: 4.2 IRGC applications 4.2.1 Food industry risk management case study using the IRGC framework 4.2.2 Conflict risk management case study using the IRGC framework 4.2.3 Energy Security risk management case study using the IRGC framework	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***2nd WA is due***	• ≈14hrs study time • ≈10hrs for Written Assignment
16	Understanding about the composite measure of value at risk for quantifying risk exposure Module sections to be covered: 5 Risk management techniques, methods & tools 5.1 Value at Risk	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time
17	Working knowledge and skills for performing risk decision analysis using decision trees Module sections to be covered: 5.2 Risk assessment techniques 5.2.1 Decision Trees / Decision analysis	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***3rd Teleconference***	• ≈14hrs study time • ≈2hrs 3rd Teleconference

18	Working knowledge and skills for producing risk and opportunity matrices for identified risks Module sections to be covered: 5.2.2 Risk and Opportunity matrices	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time
19	Working knowledge and skills for producing risk assessment using the fault tree diagrammatic technique Module sections to be covered: 5.3 Diagrammatic techniques 5.3.1 Fault tree diagrams	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***3rd Group Advisory Meeting*** • ***3rd Written Assignment is announced***	• ≈14hrs study time • ≈2hrs 3rd Group Advisory Meeting
20	Working knowledge and skills for producing risk assessment using the event tree diagrammatic technique Module sections to be covered: 5.3.2 Event tree diagrams	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time • ≈10hrs for written assignment
21	Working knowledge and skills for producing risk assessment using the cause-and-effect diagrammatic technique Module sections to be covered: 5.3.3 Cause-and-effect (or Fishbone or Ishikawa diagrams)	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time • ≈10hrs for Written Assignment

22	Working knowledge and skills for producing risk assessment using the bowtie technique Module sections to be covered: 5.3.4 The Bowtie method	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***3rd WA is due*** • ***4th Teleconference***	• ≈14hrs study time • ≈10hrs for Written Assignment • ≈2hrs Teleconference
23	Working knowledge and skills for using spreadsheets and monte carlo simulation in risk assessment. Module sections to be covered: 5.4 Spreadsheets skills (formulas, data tables, array formulas)	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time
24	Working knowledge and skills for using spreadsheets and monte carlo simulation in risk assessment. Module sections to be covered: 5.4.1 Monte Carlo / Simulation in spreadsheets using built-in features	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***4th Group Advisory Meeting***	• ≈14hrs study time • ≈2hrs 4th Group Advisory Meeting
25	Working knowledge and skills of the CORAS approach for modeling risk management. Module sections to be covered: 5.5 Risk Process Management 5.5.1aThe CORAS Method – Key concepts and Asset diagrams	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***4th Written Assignment is announced***	• ≈14hrs study time

26	Working knowledge and skills of the CORAS approach for modeling risk management. Module sections to be covered: 5.5.1b The CORAS method – Threat and Risk diagrams	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time • ≈10hrs for Written Assignment
27	Working knowledge and skills of the CORAS approach for modeling risk management. Module sections to be covered: 5.5.1c The CORAS method – Treatment and Treatment overview diagrams	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography	• ≈14hrs study time • ≈10hrs for Written Assignment
28	Working knowledge and skills of the CORAS approach for modeling risk management. Module sections to be covered: 5.5.1d The CORAS method – Illustrative examples.	• Studying the relevant material through the literature and the readers • Working on review questions relevant to the taught material • Additional bibliography • ***4th WA is due***	• ≈14hrs study time • ≈10hrs for Written Assignment
29	Revision of the material taught and preparation for the final exams	• Review of the written assignments past and current Review of the material taught • Solving student's questions • ***5th Teleconference***	• ≈14hrs study time • ≈2hrs *5th* teleconference
30-31		*Easter Holidays*	•

32-36	Revision of the material taught and preparation for the final exams	• Review of the written assignments past and current Review of the material taught • Solving student's questions • ***5th Group Advisory Meeting***	• ≈79hrs study time • ≈2hrs 5th Group Advisory Meeting
	Formal Assessment	Final Exam	• ≈3hrs exam
		Total	600hrs