



## RESEARCH METHODOLOGY

<b>Course code</b>	<i>GRAE001</i>
<b>Compulsory in the programmes</b>	<i>Financial Econometrics</i>
<b>Level of studies</b>	<i>Graduate</i>
<b>Number of credits</b>	<i>6 ECTS (36 contact hours + 2 consultation hours + 2 exam hours, 120 individual work hours)</i>
<b>Course coordinator (title and name)</b>	<i>Aleksandr Christenko (alechr@faculty.ism.lt)</i>
<b>Prerequisites</b>	<i>Econometrics, Probability theory, Mathematical statistics</i>
<b>Language of instruction</b>	<i>English</i>

### THE AIM OF THE COURSE

The course provides an advanced introduction to research methods and techniques in applied economics and finance. It covers an introduction to research and science; main issues related to research design; quantitative and qualitative research approaches and related methods; selected number of research techniques in finance. The course is designed to provide students a solid foundation for designing and conducting their own research and to enable them to become knowledgeable consumers of prior academic research results. It will also teach students how to use R programming language to apply the covered research techniques techniques.

### LEARNING OUTCOMES

On completion of this course successful students will:

<b>Course level learning outcomes (objectives)</b>	<b>Degree level learning objectives (Number of LO)</b>	<b>Assessment methods</b>	<b>Teaching methods</b>
CLO1. Understand and learn to apply basic concepts of data analytics, including those related to qualitative research methods, econometrics, and data mining.	LO1.1. LO2.1.	In-class assignments, oral presentation of research papers, oral presentation conducted by students	Lectures, seminars, self-study
CLO2. Have a critical awareness of research issues, methodologies, and methods in finance and financial economics; obtain a systematic knowledge and understanding of issues at the forefront of empirical research in finance and beyond.	LO1.1. LO1.2. LO2.1. LO3.1. LO3.2.	In-class assignments, oral presentation of research papers, oral presentation conducted by students	Lectures, seminars, self-study
CLO3. Understand the fundamental concepts of research design.	LO1.1. LO1.2.	In-class assignments, oral presentation of research papers, oral presentation conducted by students	Lectures, seminars, self-study
CLO4. Obtain skills and experience in conducting problem-based empirical research and interpreting empirical results.	LO2.1. LO3.1. LO3.2.	In-class assignments, oral presentation of research papers, oral presentation conducted by students	Lectures, seminars, self-study

### ACADEMIC HONESTY AND INTEGRITY

The ISM University of Management and Economics Code of Ethics, including cheating and plagiarism are fully applicable and will be strictly enforced in the course. Academic dishonesty, and cheating can and will lead to a report to the ISM Committee



of Ethics. With regard to remote learning, ISM remind students that they are expected to adhere and maintain the same academic honesty and integrity that they would in a classroom setting.

**COURSE OUTLINE**

Topic	In-class hours	Readings
1. Introduction: the nature of research and a quick overview of qualitative research methods	4	[1] 1, 2, 3
2. A quick reminder of quantitative research: hypothesis testing, statistical test, and regression analysis	4	[2] 1, 2, 5
3. Beyond simple regression: time-series regressions, forecasting, counterfactual analysis, weighted least squares	4	[2] 12, 15, [3]
4. ARCH and GARCH	4	[4]
5. Supervised learning data mining and machine learning methods: classification	4	[5] 1, 3, 6
6. Unsupervised learning data mining and machine learning methods: dimension reduction and clustering	4	[5] 10
<i>7. Academic paper presentation</i>	4	
8. Text mining: corpus analysis, sentiment analysis, topic modelling.	4	[6]
9. Course overview and quick discussion on other research methods (e.g., network analysis, survival analysis)	4	
<b>Total hours</b>	<b>36</b>	
CONSULTATIONS	2	
FINAL EXAM	2	

**FINAL GRADE COMPOSITION**

**Assessment methods**

Assignment	Final grade, %
Academic paper presentation: presenting and discussing a select paper	20%
Research project	30%
Final exam	50%
Total	100%

**DESCRIPTION AND GRADING CRITERIA OF EACH ASSIGNMENT**

**Academic paper presentation (20%):**

During the seventh lecture/seminar of the course students will present a research paper that they found and which employed some sophisticated methodology in order to analyse some phenomenon in the area of finance, economics, or financial economics. The presenters will have to provide a general overview of the theory covered in the paper, as well as provide an extensive discussion on the methodology used, including highlighting the limitations and drawbacks of the selected approach and how the research could be improved. After the presentation the students will have to answer one-two questions from the lectured or other students. Each presentation will be carried out in a group of two or three people.



### Research project (30%):

During the course students will carry out a research project employing one of the more complex research methods covered in the course, or some other approach that will fit the criteria that will be provided by the lecturer. The research project will have to be carried out using the R programming language and its results will be summarised in a short essay. Research projects have to be completed in a group of two / three people.

### Final exam (50%):

The final exam will test the understanding of the techniques presented throughout the course and the ability to apply them. All necessary formulas will be given by the course lecturers. It will be closed book and will include multiple choice and open questions.

### RETAKE POLICY

After receiving a failing final cumulative grade, a student can make one attempt to retake the final exam. The re-take will equal 50% of the final cumulative grade. Provided a retake is taken by a student, the acquired grades from the academic paper presentation and in the research project shall be calculated and weighted in to the final cumulative grade for the course. A student cannot retake the final presentation after he / she has received a passing final cumulative grade.

### READINGS

1. Mack, M., Woodsong, C., MacQueen, K.M., Guest, G., and Namey, E. *Qualitative Research Methods: A Data Collector's Field Guide*, 2005.
2. Studenmund, A. H., *Using Econometrics: a Practical Guide*, 6th ed., Addison Wesley, Longman 2014
3. Liu, L., Wang, Y., and Xu, Y. (2019). *A Practical Guide to Counterfactual Estimators for Causal*
4. *Inference with Time-Series Cross-Sectional Data*, SSRN papers, 2019.  
Engle, R. GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics, *Journal of Economic Perspectives*, 15(4): 157:168, 2001
5. Aggarwal, C. C., *Data Mining: The Textbook*, Springer, 2015.
6. Zhang, Y., Chen, M., and Liu, L. A Review of Text Mining, *IEEE Conference Publication*, 2015.

### ADDITIONAL READINGS

During the course a variety of additional readings will be posted on the eLearning system by the lecturers. The additional readings will include text that provide very simply explanations of relevant concepts and text that go beyond what was discussed in class.

(Last updated: 2023 01 07)



## DEGREE LEVEL LEARNING OBJECTIVES

### Learning objectives for Master of Social Science

Programme:

Financial Economics

Learning Goals	Learning Objectives
Students will be critical thinkers	LO1.1. Students will be able to identify underlying assumptions, limitations of previous research; evaluate managerial solution alternatives.
	LO1.2. Students will become <b>independent learners</b> and develop their own comprehension of scientific theories, models, and concepts.
Students will be socially responsible leaders	LO2.1. Students will be able to evaluate past and current practices in their discipline from an <b>ethical perspective</b> .
Students will be effective communicators	LO3.1. Students will develop and deliver a <b>coherent oral presentation</b> .
	LO3.2. Students will develop and deliver a <b>coherent written research paper</b> .