



COURSE SYLLABUS

DATA AND DECISIONS (Master level)

(ECTS 5)

Misija ZSEM-a je prenijeti vrijednosti, znanja i vještine potrebne studentima za dugoročan uspjeh u globaliziranom poslovnom svijetu izloženom stalnim tehnološkim i tržišnim promjenama.

The mission of ZSEM is to transfer values, knowledge, and skills that students need for long-term success in a globalized business world undergoing constant technological and market transformations

FACULTY

Faculty Prof. Vitaliy Roud, Ph.D. (lectures, exams)

Teaching assistant

Contact

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Office hours per appointment

SCHEDULE

Schedule is consistent with one determined for Summer School 2025 at Zagreb School of Economics and Management.

9 classes * 3 hours/class

COURSE DESCRIPTION

"Data and Decisions" is a Master level course crafted to enhance the ability to make informed decisions using data analysis. By integrating principles of probability, statistics, and causation, it offers a deep dive into the art of transforming data into actionable insights. Key focus areas include understanding the do's and don'ts of data analysis, encompassing data sampling, descriptive analysis, regressions, causal inference techniques, and experimental design. This fosters a robust understanding of how to interpret and utilize data effectively. This course not only imparts essential statistical skills but also emphasizes their practical application in real-world scenarios, ensuring students are equipped to tackle complex decisions with confidence. Ideal for future leaders, analysts, and decision-makers, it empowers learners with the knowledge to navigate the uncertain terrains of business and management through data-driven strategies. Engaging, practical, and insightful, this course is a gateway to mastering the nuances of data in shaping informed, evidence-based decisions. The Master Level course will provide an intro into contemporary tools for data driven story telling including R language and data visualization packages and discuss the new opportunities for data analysis delivered by the generative AI tools.

Prerequisites: Introductory Statistics and Econometrics; Basics of R language or experience with similar statistical software.

COURSE GOALS AND LEARNING OUTCOMES

	<u>General course goals</u> <i>Student will:</i>	<u>Learning outcomes</u> <i>After finishing the course 'Data and Decisions' students will be able to:</i>
1	able to apply the acquired knowledge of data-driven decisions practices in real-life circumstances	recognize the quality of data-driven reasoning of the decisions under consideration and choose the strategies to improve the managerial judgements using data
2	communicate effectively in a way appropriate for management positions.	explain, defend and argue for their decisions in class exercises.
3	the capacity of critical and analytical thinking.	discern the quality of argumentation behind the management decisions.
4	have the capacity for adaptation which is necessary for doing business in the global environment.	evaluate different ways of thinking and approaching the data-driven reasoning of decisions

TOPICS (COURSE CONTENT)

Sessions for 'Data and Decisions' Summer School class of 2026 cover these topics.

#	Topic	Exercises (as part of the session)	Methods	Readings
1.	Introduction to Data-Driven Decision Making.	-	Discussion, lecture	Main textbook, "Thinking Clearly with Data", Chapter 1
2.	Observing data. Correlation What is Causation?	-	Quiz, group activity, lecture	Chapter 2, Chapter 3
3.	Turning Uncertainty into Measurement, Samples and Statistical Inference.	-	Quiz, group activity, lecture	Chapter 4, Chapter 5
4.	Regression analysis	-	Quiz, group activity, lecture	Chapter 6, Chapter 7, Chapter 8
5.	Causal Inference Techniques, Experimental Design and Analysis.	-	Quiz, group activity, lecture	Chapter 9, Chapter 11, highlights from Chapters 12, 13, 14.
6.	Turning statistics into decisions	-	Quiz, group activity, lecture	Highlights from Chapters 15, 16, 17
7.	Project presentations and discussions			
8.	Exam Class wrap-up	-	Exam Discussion	-

* Readings marked with (C) are core texts for the topic, and they should be read by all participants; readings marked with (P) are necessary only for the presenting team. For the first session there are no prerequisite readings.

Overall dynamics of the course

Each session will consist of:

1. A quiz that covers key concepts discussed at the previous lecture

- Students will answer short questions based on the previous classes and the required readings. All resources which are aligned with ZSEM policy are permitted.
- Up to 20 min.

2. Lecture

- Important themes to cover are: what are the key concepts, tools and practices of using data for decision making

3. Group Activity

- Faculty members are facilitators.
- In class exercise, debate, varies session to session.

4. Summary

5. Reflection time

- Should help prepare individual presentations and acquire the better comprehension within the at the end of the course.
- Points to consider: What was interesting for you? How do the topics relate to you and your workplace? What will you change and how?

TEACHING METHODS AND STUDENT WORKLOAD

Lectures	27 hours
Individual student work and tasks	98 hours
Online activities	10 hours
Total	135 hours (5 ECTS-a x 27 hours)

GRADING AND ASSESSMENT

- Professor reserves the right to invite for the oral exam students before official first exam term as well as in regular examination periods. Professors will make their assessment based also on the criterion of regularity in the performance of all obligations (arrivals, commitment, and demonstrated interest in the subject).

Table 1. GRADE ELEMETS

Grade elements	Percentage	
Participation in class discussions & exercises	15%	Active participation in class is assessed.
Personal project	25%	The students are to develop and present a project, which is a data-driven presentation crafted in line with the guidelines discussed within the course and performed as an R executable notebook (template and data provided).
Exam	60%	The final exam will be available on the LMS during the last session.
TOTAL	100%	

Table 2. GRADING SCALE

Grades:	Points range
2	60-69
3	70-79
4	80-89
5	90-100

STUDENT RESPONSIBILITIES

- (1) attendance at lectures and exercises (required),
- (2) participation in discussions and assignments,
- (3) taking the written exam
- (4) required presentations

LITERATURE

Main Textbook:

Mesquita, E. B. de, & Fowler, A. (2021). *Thinking Clearly with Data: A Guide to Quantitative Reasoning and Analysis*. Princeton University Press.

Texts which will be pointed at during class:

- Hubbard, Douglas W. (2014). *How to measure anything: Finding the value of intangibles in business*. John Wiley & Sons.
- Cairo, A. (2019). *How charts lie: Getting smarter about visual information*. WW Norton & Company.
- Angrist, Joshua D., and Jörn-Steffen Pischke. *Mastering 'metrics: The path from cause to effect*. Princeton university press, 2014.
- Riche, Nathalie Henry, Christophe Hurter, Nicholas Diakopoulos, and Sheelagh Carpendale, eds. *Data-driven storytelling*. CRC Press, 2018.

CURRICULUM VITAE OF LECTURER

Dr. Vitaliy Roud is a researcher and lecturer in the Department of Economics and Mathematics at ZSEM. He has about two decades of experience in research, teaching, and consultancy in the field of innovation, as well as proficiency in quantitative and qualitative research methods. He holds a doctoral degree (Dr. rer. oec.) from the Technical University of Berlin. His research and teaching profile covers the economics of innovation and technological change, the measurement of innovation, applied data analysis and econometrics, and research tools and methods. He publishes papers in high-profile peer-reviewed journals and provides policy-relevant applied knowledge to support evidence-based decision-making for international organizations, governments, and businesses.