Econometrics

Course code	ECO105
Compulsory in the programmes	*Economics and Data Analytics, Economics and Politics*
Level of studies	*Undergraduate*
Number of credits	*6 ECTS (48 in-class hours + 6 consultation hours + 2 exam hours, 104 individual work hours)*
Course coordinator (title and name)	*Aleksandr Christenko*
Prerequisites	*Statistical Data Analysis*
Language of instruction	*English*

THE AIM OF THE COURSE:

This is an introductory course on econometrics with an emphasis on its applications. The aim of the course is to introduce the main empirical methods of economic data analysis. Students will learn how to conduct empirical studies as well as how to analyse and interpret results from other empirical work. The emphasis is on gaining an intuitive understanding of the principles of econometric analysis and applying them to actual data. Students are taught how to build a suitable econometric models, understand the strengths and limitations of empirical methods, correctly interpret results, and draw valid conclusions. The main topics covered include: regression analysis with a focus on Ordinary Least Squares, dummy dependent variable models, time series, and panel data regression models.

MAPPING OF COURSE LEVEL LEARNING OUTCOMES (OBJECTIVES) WITH DEGREE LEVEL LEARNING OBJECTIVES (See Annex), ASSESSMENT AND TEACHING METHODS

Course level learning outcomes (objectives)	Degree level learning objectives BSC	Assessment methods	Teaching methods
CLO1. Understand and apply basic concepts of data analysis into econometrics: descriptive statistics, sampling, estimation and hypothesis testing.	ELO 1.1 ELO 1.2 ELO 3.2	Midterm test, laboratory assignments, final exam	Lectures, laboratory work assignments, independent work
CLO2. Analyse and evaluate linear regression models: build econometric models and understand the main assumptions of the model.	ELO 1.1 ELO 1.2 ELO 3.2	Midterm test, laboratory assignments, final exam	Lectures, laboratory work assignments, independent work
CLO3. Use linear regression models for economic analysis: use suitable software, interpret regression results, conduct hypothesis testing, and evaluate the model.	ELO 1.1 ELO 1.2 ELO 3.2	Midterm test, laboratory assignments, final exam	Lectures, laboratory work assignments, independent work
CLO4. Understand and apply the logit model for economic analysis.	ELO 1.1 ELO 1.2 ELO 3.2	Final exam	Lectures, laboratory work assignments, independent work
CLO5. Understand and apply time series regression for economic analysis	ELO 1.1 ELO 1.2 ELO 3.2	Laboratory assignments, final exam	Lectures, laboratory work assignments, independent work

CLO6. Understand and apply panel data for economic analysis.	ELO 1.1 ELO 1.2 ELO 3.2	Laboratory assignments, final exam	Lectures, laboratory work assignments, independent work
CLO7. Understand and apply simultaneous equations for economic analysis.	ELO 1.1 ELO 1.2 ELO 3.2	Final exam	Lectures, laboratory work assignments, independent work

ACADEMIC HONESTY AND INTEGRITY

The ISM University of Management and Economics Code of Ethics, including cheating and plagiarism, is 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 reminds students that they are expected to adhere to and maintain the same academic honesty and integrity that they would in a classroom setting.

COURSE OUTLINE

Week	Topic	In-class hours	Readings
1.	1. Review of statistical principles and an overview of regression analysis	4	Studenmund, Ch1, 15 Wooldridge, Appendix C
2.	2. Hypothesis testing	4	Studenmund, Ch5
3.	3. Ordinary Least Squares	4	Studenmund, Ch2
4.	4. The classical assumptions	4	Studenmund, Ch4
5.	5. Classical assumptions: violations and treatments	4	Studenmund, Ch8-9
6.	6. Model specification and the Ramsey's RESET test	4	Studenmund, Ch6-7
7.	*Midterm exam*	2	
8.	7. Dummy dependent variables – the binomial logit model	4	Studenmund, Ch12
9.	8. Introduction to time series regressions	4	Studenmund, Ch11
10.	9. Time series regression continued: stationarity and the Granger-causality test	4	Studenmund, Ch11,14
11.	10. Regression with panel data: pooled OLS, fixed effects, and random effects models	4	Wooldridge, Ch13-14
12.	11. Simultaneous equations	4	Studenmund, Ch13
	Course review	2	
	Total hours	**48**	
	CONSULTATIONS	6	
	FINAL EXAM	2	

FINAL GRADE COMPOSITION

Assessment methods

Assignment	Topics	Total hours	Final grade, %
Midterm exam	1-6	30	30
Final exam	7-11	30	30
Laboratory assignment 1		17	20
Laboratory assignment 2		17	20
Consultations		6	
Total		100	100%

Midterm exam. It will be held on week 7 of the term. It counts towards 30% of the final grade. The midterm will be based on topics 1-6. The midterm be closed book and will include multiple-choice questions and open questions.

Final exam. The exam counts towards 30% of the final grade. It is a closed book and includes multiple-choice questions and open questions. It tests conceptual, analytical, and numerical skills. The exam will be based on topics 7-12. The final written examination will take place during the examination session.

Laboratory assignments. In the assignments, students will have to prepare reports of performed analysis following a framework provided by the instructor. Assignments have to be completed in a group of two or three students. The content of each assignment will be similar to computer exercises performed during the seminars. There will be two assignments each worth 20% of the final grade.

The retake exam. After receiving a failing final cumulative grade, a student can retake the exams. A retake exam will consist of all course material and will constitute 60% of the final grade. Laboratory assignments cannot be retaken at a later time, but their grades will be incorporated into the final grade.

Readings:

1. Studenmund, A. H., *Using Econometrics: a Practical Guide, 6th ed.*, Addison Wesley, Longman 2014

Additional Readings:

1. Wooldridge Jeffrey, M., *Introductory Econometrics: A Modern Approach, 4th ed.*, Thompson/ South-Western, 2009. Stock, James H. and Mark W. Watson, Introduction to Econometrics, Addison Wesley, Pearson, 2014.

2. James, Gareth, et al. *An Introduction to Statistical Learning: with Applications in R. 1st ed.*, Springer, 2013

3. Readings uploaded throughout the course to the eLearning system

DEGREE LEVEL LEARNING OBJECTIVES

Learning objectives for the <u>Bachelor of Business Management</u>
Programmes:
International Business and Communication,
Business Management and Marketing, Finance,
Industrial Technology Management

Learning Goals	Learning Objectives
Students will be critical thinkers	BLO1.1. Students will be able to understand core concepts and methods in the business disciplines
	BLO1.2. Students will be able to conduct a contextual analysis to identify a problem associated with their discipline, to generate managerial options and propose viable solutions
Students will be socially responsible in their related discipline	BLO2.1. Students will be knowledgeable about ethics and social responsibility
Students will be technology agile	BLO3.1. Students will demonstrate proficiency in common business software packages
	BLO3.2. Students will be able to make decisions using appropriate IT tools
Students will be effective communicators	BLO4.1. Students will be able to communicate reasonably in different settings according to target audience tasks and situations
	BLO4.2. Students will be able to convey their ideas effectively through an oral presentation
	BLO4.3. Students will be able to convey their ideas effectively in a written paper

Learning objectives for the <u>Bachelor of Social Science</u>
Programmes:
Economics and Data Analytics,
Economics and Politics

Learning Goals	Learning Objectives
Students will be critical thinkers	ELO1.1. Students will be able to understand core concepts and methods in the key economics disciplines
	ELO1.2. Students will be able to identify underlying assumptions and logical consistency of causal statements
Students will have skills to employ economic thought for the common good	ELO2.1.Students will have a keen sense of ethical criteria for practical problem-solving
Students will be technology agile	ELO3.1. Students will demonstrate proficiency in common business software packages
	ELO3.2. Students will be able to make decisions using appropriate IT tools
Students will be effective communicators	ELO4.1.Students will be able to communicate reasonably in different settings according to target audience tasks and situations
	ELO4.2.Students will be able to convey their ideas effectively through an oral presentation
	ELO4.3. Students will be able to convey their ideas effectively in a written paper