



## COURSE (MODULE) DESCRIPTION

Course title	Code
Econometric Theory and Practice	

Staff	Department
<b>Coordinator:</b> Dr Povilas Lastauskas (PhD Cantab) <b>Other(s):</b> Dr Soroosh Soofi Siavash	Faculty of Economics and Business Administration

Study cycle	Course type
First (Bachelor's)	Compulsory

Form of implementation	Period of implementation	Language of instruction
Face-to-face	Full year	English

Requirements for student	
<b>Prerequisites:</b> Mathematical Methods and Statistical Theory	<b>Additional requirements (if any):</b>

Number of ECTS credits	Student's workload	Contact hours	Individual work
10	260	72	188

Purpose of the course and competences developed		
This course aims to provide a broad overview of basic and a few more advanced econometric methods, to focus on <i>understanding</i> , <i>interpreting</i> and <i>applying</i> econometric assumptions and to apply the techniques when analyzing economic behavior.		
Learning outcomes (corresponding learning outcomes of the programme)	Teaching methods	Assessment methods
Have acquired knowledge in a number of econometric concepts and methods, understand their limitations. (1.1, 2.1)	Lectures and lecture notes, tutorials, reading academic literature.	Written exam (50%) Problem Sets and econometric project (50%)
Able to competently apply econometric when analyzing economic behavior. (1.2)	Lectures and lecture notes, tutorials, computer exercises and empirical practice.	
Learn how to use R/STATA software during the practical sessions. (2.2, 3.2)	Tutorials with empirical contents (R/STATA exercises).	
Undertake applied research that uses empirical evidence to validate economic arguments, interpret findings. (3.4)	Independent econometric project.	
Present empirical findings in the class-room. (4.2)	Presentations in tutorials.	

Course themes	Contact / Individual work: time and assignments								Assignments due date
	Lectures	Tutorials	Seminars	Practical classes	Laboratory work	Practice	Contact hours	Individual work	
<b>FALL semester</b> (Econometric Theory and Practice I)									
Review of Statistics: Probability, Sampling Distributions, Random Variables, Expectations and Moments	2						2	4	
Statistical Inference: CLT, Asymptotics, Confidence Intervals	4	2					6	12	<b>Problem Set:</b> Stock and Watson (chapters 2 and 3)
Single Regression: Conditional Expectation Function, Classical Assumptions, Goodness of Fit. Inference.	10	2					12	30	<b>Problem Set:</b> Stock and Watson (chapters 4 and 5)
Gauss-Markov Theorem (with a proof)	2						2	4	
Multivariate Regression. Basics of Matrix Algebra.	6	2					8	18	<b>Problem Set:</b> Stock and Watson (chapter 6, 17, 18.1)
Hypothesis tests in multivariate regression	4	2					6	18	<b>Problem Set:</b> Stock and Watson (chapters 7)
<b>SPRING semester</b> (Econometric Theory and Practice II)									
Omitted Variables, Short and long regressions. Causality: Experiments and Quasi-Experiments, and Observational Data. Program Evaluation.	6						6	18	Stock and Watson (chapters 9 and 13). Research article.
Instrumental Variables and Two-stage Least Squares. Measurement Errors. Other threats to Internal Validity	4	2					6	18	<b>Problem Set:</b> Angrist and Pischke (chapters 3, 6) and Stock and Watson (chapter 12). Theory and empirical exercises, a research article.
Introduction to Time Series. Testing and Dynamic Causal Effects (exogeneity, restrictions, heteroscedasticity and serial correlation)	6	4					10	20	Stock and Watson (chapters 14 and 15).
Forecasting	4						4	16	Diebold (chapters 1 and 2)
Coming Together: Cross sections over time, Introduction to Panel Data Econometrics	8	2					10	30	<b>Problem Set:</b> Stock and Watson (chapter 10). Empirical exercises, one research article.
The Theory of Multiple Regression (only time permitting)									Stock and Watson (chapter 18).
<b>Total</b>	<b>56</b>	<b>16</b>					<b>72</b>	<b>188</b>	

Assessment strategy	Share in %	Time of assessment	Assessment criteria
<b>Fall semester</b> (Econometric Theory and Practice I)			
Written exam	50	End of fall semester	The final exam will consist of essays and mathematical questions in which students have to show their knowledge and analytical capabilities, and shorter questions testing knowledge of students for computer analysis in R.
Problem sets	50	Throughout semester	There will be problem sets, roughly every 2 <sup>nd</sup> or 3 <sup>rd</sup> week, which will involve problem solving and hands-on computer analysis in R.
<b>Spring semester</b> (Econometric Theory and Practice II)			
Written exam	50	End of spring semester	The final exam will consist of both longer open questions in which students have to show their analytical capabilities and of shorter questions simply testing students' knowledge.
Econometric project	30	Before Easter holidays	Econometric project is evaluated in terms of: How carefully the statement of the research question is considered; How well the variable descriptions, summary statistics and econometric results tables are produced, and How the results are interpreted.
Problem Sets/Tests	20	Throughout the semester	Two graded problem sets and/or tests.
Bonus	0-10	Active participation	Additional points for insightful contributions to the discussions during the lecture and seminar sessions.

Author	Published in	Title	Issue No. or Volume	Publishing house or Internet site
<b>Required reading</b>				
Lecture notes and slides as well as online resources will be made available to all students. Compulsory readings constitute chapters from the following books: Angrist and Pischke (2014), Dougherty (2016), Stock and Watson (2014), and Diebold (2006). Other texts are supplementary; some research articles will be assigned as homework.				
Angrist, J. D. and J.-S. Pischke	2014	Mastering 'Metrics: The Path from Cause to Effect	First Edition	Princeton University Press
Dougherty, C.	2016	Introduction to Econometrics	Fifth Edition	Oxford University Press
Murray, P. Michael	2006	Econometrics: A Modern Introduction	First Edition	Pearson
Stock, J. H. and M. W. Watson	2014	Introduction to Econometrics	Third Edition	Pearson Education
Francis X. Diebold	2006	Elements of Forecasting	Fourth Edition	<a href="https://www.sas.upenn.edu/~fdiebold/Teaching2">https://www.sas.upenn.edu/~fdiebold/Teaching2</a>

				21/FullBook.pdf
<b>Supplementary reading (text books)</b>				
Wooldridge, Jeffrey M.	2013	Introductory Econometrics: A Modern Approach	Fifth Edition	Cengage Learning
<b>Supplementary reading (articles)</b>				
Acemoglu, Daron, Simon Johnson and James A. Robinson	2001	The Colonial Origins of Comparative Development: An Empirical Investigation	<i>American Economic Review</i>	
Angrist, Joshua D. and Alan B. Krueger.	2001	Instrumental variables and the search for identification: From supply and demand to natural experiments	<i>The Journal of Economic Perspectives</i>	
Card, David	1990	The Impact of the Mariel Boatlift on the Miami Labor Market	<i>Industrial and Labor Relations Review</i>	
DiNardo, John.	2007	Interesting Questions in 'Freakonomics	<i>Journal of Economic Literature</i>	
Dynarski, Susan	2003	Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion	<i>American Economic Review</i>	