Faculty of Economics and Business Administration

COURSE UNIT (MODULE) DESCRIPTION

Course unit (module) title	Code
Econometric Theory and Practice	Confirmed on May 15, 2024

Academic Staff	Core academic unit(s)
Coordinator: Dr Soroosh Soofi Siavash **Other(s):** Dr Guillermo Hausmann-Guil	Faculty of Economics and Business Administration

Study cycle	Type of the course unit
First (Bachelor's)	Compulsory

Mode of delivery	Semester or period when it is delivered	Language of instruction
Face-to-face	Full year	English

Requisites	
Prerequisites: Mathematical Methods and Statistical Theory	**Co-requisites (if relevant):**

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

Purpose of the course unit

This course aims to provide a broad overview of basic and a few more advanced econometric methods, to focus on *understanding*, *interpreting* and *applying* econometric assumptions and to apply the techniques when analyzing economic behavior.

Learning outcomes of the course unit (corresponding learning outcomes of the program)	Teaching and learning 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.	Fall semester: written exam (50%), problem sets (50%) Spring semester: 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 classroom. (4.2)	Presentations in tutorials.	

Content	Contact / Individual work: time and assignments								
	Lectures	Tutorials	Seminars	Workshops	Laboratory work	Internship	**Contact hours, total**	**Individual work**	**Tasks for individual work**
FALL semester									
Review of Statistics: Probability, Sampling Distributions, Random Variables, Expectations and Moments	2						2	4	
Statistical Inference: CLT, Asymptotics, Confidence Intervals	4	2					6	12	Problem Set: Stock and Watson (chapters 2 and 3)
Single Regression: Conditional Expectation Function, Classical Assumptions, Goodness of Fit. Inference.	10	2					12	30	Problem Set: 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	Problem Set: Stock and Watson (chapter 6, 17, 18.1)
Hypothesis tests in multivariate regression	4	2					6	18	Problem Set: Stock and Watson (chapters 7)
SPRING semester									
Causality: Experiments and Observational Data, Program Evaluation. Omitted Variables, Short and long regressions	6						6	18	Reading research articles and presenting results in group presentations. Stock and Watson (chapters 9 and 13). Replication of published results with omitted variable problem.
Instrumental Variables and Two-stage Least Squares. Measurement Errors	4	2					6	18	Problem Set: Angrist and Pischke (chapters 3, 6) and Stock and Watson (chapter 12). STATA exercises, two research articles.
Introduction to Time Series. Testing and Dynamic Causal Effects (exogeneity, restrictions, heteroscedasticity and serial correlation)	6	4					10	26	Stock and Watson (chapters 14 and 15). Research articles.
Coming Together: Cross sections over time, Introduction to Panel Data Econometrics	12	2					14	40	Problem Set: Stock and Watson (chapter 10). STATA exercises, one research article.
The Theory of Multiple Regression (time permitting)									Special Problem Set (time permitting). Stock and Watson (chapter 18).
Total	**56**	**16**					**72**	**188**	

Assessment strategy	Weight %	Deadline	Assessment criteria
Fall semester			
Midterm exam	50	Roughly after half of the course	The midterm and final exams 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.
Final exam	50	End of fall semester	
Spring semester			
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. The final exam will test the material from the whole course with a focus on the second part of the course.
Econometric project	50	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.

Author (-s)	Publishing year	Title	Issue no. or volume	Publishing house or web link
Required reading				
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) and Stock and Watson (2014). 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 Econoemtrics	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
Recommended reading				
Wooldridge, Jeffrey M.	2013	Introductory Econometrics: A Modern Approach	Fifth Edition	Cengage Learning
Articles				
Acemoglu, Daron, Simon Johnson and James A. Robinson	2001	The Colonial Origins of Comparative Development: An Empirical Investigation	*American Economic Review*	
Angrist, Joshua D. and Alan B. Krueger.	2001	Instrumental variables and the search for identification: From supply and demand to natural experiments	*The Journal of Economic Perspectives*	

Card, David	1990	The Impact of the Mariel Boatlift on the Miami Labor Market	*Industrial and Labor Relations Review*	
DiNardo, John.	2007	Interesting Questions in 'Freakonomics	*Journal of Economic Literature*	
Dynarski, Susan	2003	Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion	*American Economic Review*	