Syllabus

Course Description

Course Title	Advanced Econometrics
Course Code	29122
Course Title Additional	
Scientific-Disciplinary Sector	NN
Language	English
Degree Course	PhD Programme in Economics and Finance
Other Degree Courses (Loaned)	
Lecturers	Prof. Steven Eric Stillman, Steven.Stillman@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/36390 Prof. Francesco Ravazzolo, Francesco.Ravazzolo@unibz.it https://www.unibz.it/en/faculties/economics-management/academic-staff/person/36066
Teaching Assistant	
Semester	First semester
Course Year/s	2026/27
CP	5
Teaching Hours	30
Lab Hours	0
Individual Study Hours	0
Planned Office Hours	
Contents Summary	The objective of the course is to develop specific skills primarily in the application of econometric analysis tools. The course is based on a combination of lectures and tutorials in which each topic is discussed from both a methodological and an applied perspective. The aim is to provide an overview of several quantitative research methods and examples of how they can be applied to economic and financial research problems involving data collection and

	analysis.
Course Topics	Part 1: Introduction to Applied Research: Data collection, data processing, descriptive analysis, survey design Part 2: Casual Analysis Experimental methods, difference-in-differences, regression discontinuity, instrumental variables, fixed effects models, recent advanced in causal analysis Part 3: Likelihood Methods Likelihood function for i.i.d. data. Estimation by max Likelihood (MLE).Numerical methods for maximizing the likelihood. The EM algorithm.The Cramér Rao lower bound and the Fisher information matrix. Properties of the MLEs. Likelihood ratio tests Part 4: Time Series Analysis Review of different estimation methods (OLS, NLS, ML, GMM, Bayesian). Time-Series Analysis models and methods for predicting future variables: specification, inference and forecasting. (Monte Carlo) Simulation Methods.
Keywords	Causal analysis, likelihood methods, Time Series Analysis
Recommended Prerequisites	
Propaedeutic Courses	
Teaching Format	The course will combine in-class explanation of the background material, problem-solving and case discussions. Students will be expected to participate actively in class work, which will give them the opportunity to apply theoretical concepts to realistic situations. In order to benefit from this approach, it is important that all students come to class fully prepared.
Mandatory Attendance	Required
Specific Educational Objectives and Learning Outcomes	PhD programme: The courses aim to train researchers with strong quantitative and theoretical skills, capable of analyzing economic and financial phenomena. Candidates' dissertations are expected to adhere to the highest standards of scientific rigor and to demonstrate innovative features that make them suitable for publication in leading international

	peer-reviewed journals. The programme therefore seeks to contribute to the international scientific debate in economics and finance. To this end, candidates will be encouraged to employ state-of-the-art methodologies and to adopt a multidisciplinary approach. The advanced training provided by the programme, together with the research methods required to complete the dissertation, prepares candidates both for an academic career and for high-level professional positions involving policy analysis and policymaking.
Specific Educational Objectives and Learning Outcomes (additional info.)	The ability to apply theoretical and empirical models. The ability to interpret the results of econometric and statistical analyses and draw appropriate conclusions. The ability to plan and manage academic research efficiently and independently.
Assessment	Short written assignments and Solution of case studies: Written assignments and case studies will be assigned during the course to be completed and sometimes presented in class.
Evaluation Criteria	Standard criteria for evaluating assignments, completeness, correctness.
Required Readings	References will be provided by the professors during the course
Supplementary Readings	
Further Information	10 hours Prof. Francesco Ravazzolo, 12 hours Prof. Steven Stillman, 8 hours Prof. Emanuele Taufer
Sustainable Development Goals (SDGs)	No poverty, Zero hunger, Good health and well-being, Reduced inequalities, Gender equality, Decent work and economic growth, Quality education