Syllabus
Course description

Course title	Basic Statistical and Econometrics Method
Course code	29052
Scientific sector	SECS-P/05
Degree	PhD in Economics and Finance
Semester and academic year	1st semester 2021-2022
Year	1st
Credits	6 (3 + 3)
Modular	2

Total lecturing hours	36
Total office hours	Not foreseen
Total exercise hours	Not foreseen
Attendance	required
Prerequisites	-
Course page	-
Specific educational objectives	The aim of the module is to develop specific skills in applied econometric and statistical research by a mix of lectures and tutorials where each topic is discussed in both methodology and application. The intention is to provide a description of a number of different quantitative research methods and examples of how they may be applied to economics and finance research problems for the collection and analysis of data. More specifically educational objective include: - Ability to apply theoretical and empirical models. - Ability to interpret the results of econometric and statistical analysis and draw appropriate conclusions. - Ability to efficiently plan and manage independent academic research.

Lecturer	Steven Stillman, F. Marta L. Di Lascio
Scientific sector of the lecturer	SECS-P/03, SECS-S/01
Teaching language	English
Office hours	please refer to the lecturer's web page
Lecturing assistant	

List of topics covered	Part 1: Introduction to Applied Research:
	    Data collection, data processing, descriptive analysis, survey design
	
	Part 2: Review of Linear Regression Methods
	
	Part 3: Casual analysis and Panel Data
	    Experimental methods, difference-in-differences,

	regression discontinuity, instrumental variables, fixed effects models, recent advanced in causal analysis
	
	Part 4: Time series analysis
	    Stochastic processes and their properties, ARIMA models for time series, Box & Jenkins procedure for SARIMA modeling.
	
	Part 5: Copula theory
	    Bivariate and multivariate statistical analysis of association. Copula function. Families of copula models. Estimation methods for copulas. Mixture of copula models and the EM algorithm. Copula-based time series analysis.
	
	Part 6: Advanced R programming
	    Functions, anonymous functions and closures, looping and conditional expressions, functionals, rolling computations.
	
	Part 7: Clustering methods
	    Proximity matrix and dissimilarity measures, hierarchial and non hierarchical clustering algorithms, model-based clustering methods, criteria to select the number of clusters.
	
	Part 8: Dimensionality reduction methods
	    Principal component analysis and factor analysis.

Teaching format	Lectures, face-to-face coaching and mentoring.

Learning outcomes	The course will equip students with the following analytical skills: Analysis, Synthesis, Evaluation, Application; Managing information and knowledge; Research related skills. In addition the course will develop the following behavioral, organizational and communication skills: personal effectiveness, learning, autonomy, technical expertise, communication and problem-solving using IT software. More precisely, the learning outcomes include: - Knowledge and understanding quantitative methodologies used by researchers in economics and related fields, including data collection, data processing and analysis, model design and analytics - Applying knowledge and understanding to techniques for analyzing quantitative data in economics and related fields. - Making judgments regarding the suitability of

	particular methods to research in economics and business.
	- Making informed choices in regard to quantitative methods for decision-making , selection and application of research methods using statistical software, IT and communication skills, available statistical information and data.
	- Can be expected to be able to promote, within academic and professional contexts, technological and socio-economic advanced knowledge

Assessment	Class homework and discussion of issues. Problem sets for each units and a replication project.
Assessment language	English
Evaluation criteria and criteria for awarding marks	Class homework and replication of academic papers proposed by the professors.

Required readings	References will be provided by the professors during the course
Supplementary readings	-