# Syllabus

## Course description

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

- 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 objectives 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,
### Part 4: Time series analysis
- Stochastic processes and their properties, ARIMA models for time series, Box & Jenkins procedure for SARI/MA modeling.

### Part 5: Copula theory

### 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, hierarchical 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.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Class homework and discussion of issues. Problem sets for each units and a replication project.</th>
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</thead>
<tbody>
<tr>
<td>Assessment language</td>
<td>English</td>
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<tr>
<td>Evaluation criteria and criteria for awarding marks</td>
<td>Class homework and replication of academic papers proposed by the professors.</td>
</tr>
<tr>
<td>Required readings</td>
<td>References will be provided by the professors during the course</td>
</tr>
<tr>
<td>Supplementary readings</td>
<td>-</td>
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