# NOVA SCHOOL OF BUSINESS & ECONOMICS

# COURSE SYLLABUS 2165 - Microeconometrics, 7 ECTS Spring Semester 202425

# **COURSE INSTRUCTOR**

Alex Armand

# SHORT BIOGRAPHY

Alex Armand is Professor of Economics at Nova SBE, a research affiliate at CEPR, and a research fellow at the Institute for Fiscal Studies (UK). His main research fields are Applied Microeconomics, Development Economics and Political Economy. During his professional career has been leading research projects in Macedonia, Mozambique, India, Bolivia and Honduras. He holds a PhD in Economics from the University College London, and a MSc from Universitat Pompeu Fabra.

# **INSTITUTIONAL EMAIL**

alex.armand@novasbe.pt

# **OFFICE HOURS**

By appointment (e-mail the instructor)

Scientific Area/Área Científica: Métodos Quantitativos					
Frequency/Periodicidade:	Semestral				
Number of Contact Hours/ Número Horas Contacto:					
(T) Teóricas/Theoretical:	0000:00	(TP) Teórico-Práticas/Theoretical-Practical:	0036:00		
(P) Práticas/Practical:	0000:00	(OT) Orientação Tutorial/Tutorial Orientation:	0010:00		
(PL) Práticas Laboratoriais/Pratical Labs:	000:00	(S) Seminário/Seminar:	0000:00		
Horas Dedicadas/Dedicated Hours:	0150:00	)			
Total Horas/Total Hours:	0196:00	)			

# PREREQUISITE(S) / PRÉ-REQUISITO(S)

NA

# **COURSE UNIT AIMS**

The course covers a range of advanced econometric techniques frequently employed in the analysis of micro data (at the household, individual or firm level). The course intends to make the student familiar with statistical and econometric techniques that are used in the analysis of microeconomic data, both to recover causal relationships and for the purpose of statistical or machine learning. Lectures combine theory and empirical applications and will include examples and discussions of empirical papers that employ the different techniques.

# **COURSE UNIT CONTENT**

The course will cover the following topics. The course outline is a guide to the general nature and order of the topics covered in the course. Some variation may occur.

• General microeconometrics approach

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- Identification in linear models (cross-section data)
- Counterfactuals from ATE to LATE
- Identification in linear models (panel data)
- Non-linear models and the maximum likelihood
- Latent variable models
- Censored data
- Sample selection
- GMM

#### LESSON PLAN

Lesson Synopsis

**Additional details** 

**Materials/ Readings** 

### LEARNING OBJECTIVES

The main objective of the course is to provide students with the knowledge to do their own applied work in microeconomics. The course will help students to understand and implement econometric techniques, and to know the conditions required for the estimators studied to be applicable in economic applications. At the end of the course, students should be able to articulate the differences between different estimation methods that may be used in a given application and to understand how the choice of an estimation method may affect the conclusions drawn from a given research project.

#### A. Knowledge and Understanding

Students taking the course should be able to understand identification, critically choose different estimators for micro-level data, being able to run single and multiple regressions and to interpret its results, being able to work with panel data, to run fixed and random effects models, being able to work with limited dependent variables, and understand sample selection problems.

#### **B.** Subject-Specific Skills

Statistics and Math knowledge at Master level.

#### C. General Skills

Being able to think about limitations of different data structures.

# LEARNING OUTCOMES

	Learning outcome	Proficiency level
Ι	I Analyses and evaluates national and international economic contexts	
II	I Applies quantitative and technical skills to analyse and solve economic issues	
III	Demonstrates proficiency in leveraging core economic principles and techniques to effectively resolve practical economic problems	proficient
IV	Demonstrates effective interpersonal and communication skills to enhance teamwork and collaboration across various settings	proficient
V	Utilizes analytical, critical thinking, and problem-solving skills to navigate challenges and enable lifelong learning within teams and organizations	expert
VI	Leverages a deep understanding of sustainability in business and economics to drive ethical transformations and positive outcomes across organizational and project contexts	proficient

If this is a mandatory course for a degree program's, the table above will already include the learning outcomes and their respective proficiency levels, as validated by the program s academic director. It outlines how the course contributes to the program's 6 learning outcomes. If you believe the course impacts these outcomes differently, you may directly edit the table to adjust the proficiency levels using the following

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categories: N/A (does not contribute), developing (basic understanding), proficient (solid understanding), or expert (advanced proficiency). If the table is empty, you may define and enter the learning outcomes and proficiency levels you find appropriate.

# DEMONSTRATION OF THE COHERENCE OF THE SYLLABUS WITH COURSE UNIT AIMS/LEARNING OBJECTIVES

Students taking this course will be able to understand, with a critical view, the advantages and disadvantages of different methods used in applied economics for estimation of causal relationships.

# TEACHING AND LEARNING METHODS

A variety of teaching and learning methods will be used in this course: lectures covering both theoretical and empirical topics, weekly problem sets with applications of the material covered during lectures, and a group assignment with an econometric project to be carried out.

# DEMONSTRATION OF THE COHERENCE OF THE TEACHING METHODS WITH COURSE LEARNING OBJECTIVES

The combination of theoretical classes with applications in problem sets allow students to learn both the theoretical foundations of microeconometric methods and their applications.

# ASSESSMENT

The assessment of the course is composed of the following components:

- Three problem sets (15% of your final grade)
- Group assignment (30% of your final grade)
- Final exam (55% of the final grade).

There is a minimum passing grade in the final exam of 8.

In accordance with the school norms, there is no procedure for grade improvement after passing a course (no re-sit or second course enrolment).

# BIBLIOGRAPHY

The course will not follow a specific textbook, but the following three books are good general references for microeconometrics. Additional readings to the textbook will be posted in the course Moodle webpage.

- Wooldridge, J. (2001), Econometric Analysis of Cross-Section and Panel Data. MIT Press, Cambridge, MA.
- Angrist, Joshua D., and Steffen Pischke (2008), Mostly harmless econometrics: An empiricists companion. Princeton university press, 2008.
- [MORE ADVANCED] Cameron, A. C., and P. K. Trivedi (2005), Microeconometrics: Methods and Applications. Cambridge University Press, New York, NY.
- [MORE ADVANCED] An Introduction to Statistical Learning (<u>https://www.statlearning.com/</u>)

# **ADDITIONAL INFORMATION**

Throughout the teaching period, the course equips students with foundational skills that will enable them to develop further understanding in future courses, directly related with the SDG Agenda.



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