

Econometrics

Summer bridge course for ICEF MSc students 2022

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Course description and objectives

In this course we will review the crucial topics from different branches of mathematics and discuss basic ideas from econometrics. We will make accent on topics from matrix algebra and mathematical statistics which are directly used in introductory and advanced econometrics and solve problems from many popular econometric textbooks.

Course outline

1. Mathematical analysis: limits and constrained optimization. (2 hours)
2. Matrix algebra: solutions to systems of linear equations, matrix algebra, operations of matrix transposition and inversion, diagonalization, matrix decompositions. (4 hours)
3. Statistics: Estimation using ordinary least squares (OLS), maximum likelihood, and method of moments. Central limit theorems, law of large numbers. Consistency of estimators. Conditional expectation. Law of total expectation. Law of total variance. (4 hours)
4. Introduction to Econometrics: simple regression, OLS estimation of parameters, Gauss-Markov theorem, statistical testing (significance and linear restriction tests), R squared, multivariate regression, multicollinearity and heteroscedasticity. (10 hours)

Textbooks

1. Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*, MIT press
2. Hansen, B. E. (2022). *Econometrics*, Princeton University Press (<https://www.ssc.wisc.edu/~bhansen/econometrics/>)
3. Hansen, B. E. (2022). *Probability and Statistics for Economists*, Princeton University Press (<https://www.ssc.wisc.edu/~bhansen/probability/>)

Assessment

There will be a final exam comprising 100% of the total grade.