APPLIES TO ACADEMIC YEAR 2016/2017

GRA 6839 Numerical methods for economics and finance

Programme
Free electives/minors, Master of Science in Business

Responsible for the course
Alfonso Irarrazabal

Department
Department of Economics

Term
According to study plan

ECTS Credits
3

Language of instruction
English

Introduction
(Max 25 students each semester)

Advances in computing power has allowed economists and finance analysts to expand the set of toolbox to analyze theoretical and practical problems. Currently, numerical methods are used by academics as well as practitioners in central banks and the private sector.

In this course we will learn basics numerical methods and use them to solve real problems in economics and finance. Emphasis on applications

Prerequisite: Knowledge of basic calculus and statistics

Learning outcome
Learn basics programming.
Learn how to code in Python.
Learn basic data analysis and visualization techniques.
Learn how to implement simple econometrics analysis.
Learn how to apply numerical methods to problems in economics and finance.

Prerequisites

All courses in the Masters programme will assume that students have fulfilled the admission requirements for the programme. In addition, courses in second, third and/or fourth semester can have spesific prerequisites and will assume that students have followed normal study progression. For double degree and exchange students, please note that equivalent courses are accepted.

Compulsory reading
Books:
Mc Kinney, W. 2013. Python for Data Analysis. 1st ed. O'Reilly

Recommended reading

Other:
Introduction to scientific computing. Robert Johansson. Online lectures and notebooks. https://github.com/jrjohansson/scientific-python-lectures
Quantitative Economics. Sargent and Stachurski. Online lecture notes. http://quant-econ.net

Course outline
The course covers the following topics
- Introduction to programming.
- Basic techniques in scientific programming.
- Basic data analysis and visualization
- Applications to econometrics and forecasting
- Applications economics and finance.

Computer-based tools
Not applicable

Learning process and workload
A course of 3 ECTS credits corresponds to a workload of 80-90 hours.

All software is open source and therefore free. We will use Jupyter and Python.

Examination
Take home examination 72 hours (Computational project)

Form of assessment	Weight	Group size
Take home examination	100%	Optional (individual or group of max 3 students)

Specific information regarding student assessment will be provided in class. This information may be relevant to requirements for term papers or other hand-ins, and/or where class participation can be one of several components of the overall assessment. Candidates may be called in for an oral hearing as a verification/control of written assignments.

Examination code(s)
GRA 68391 Take home examination (72 hours) accounts for 100 % of the final grade in GRA 6839.

Examination support materials
Not applicable
Permitted examination support materials for written examinations are detailed under examination information in the student portal @bi. The section on support materials and the use of calculators and dictionaries should be paid special attention to.

Re-sit examination
It is only possible to retake an examination when the course is next taught. The assessment in some courses is based on more than one exam code. Where this is the case, you may retake only the assessed components of one of these exam codes. All retaken examinations will incur an additional fee. Please note that you need to retake the latest version of the course with updated course literature and assessment. Please make sure that you have familiarised yourself with the latest course description.

Additional information
Honour code. Academic honesty and trust are important to all of us as individuals, and are values that are integral to BI's honour code system. Students are responsible for familiarising themselves with the honour code system, to which the faculty is deeply committed. Any violation of the honour code will be dealt with in accordance with BI’s procedures for academic misconduct. Issues of academic integrity are taken seriously by everyone associated with the programmes at BI and are at the heart of the honour code. If you have any questions about your responsibilities under the honour code, please ask. The learning platform itslearning is used in the teaching of all courses at BI. All students are expected to make use of itslearning.