

Programming for Economics and Finance 10055 ECON 5006-R11

Summer 2019

Department of Economics

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The main goal of this course is to give the participants a clear exposition of current programs used in economics and finance. The main programs to be presented are Matlab and R. A brief overview of Eviews and SAS will be also given. Finally, the use of Latex will be required as the main program to be used for writing the reports. The course will be developed using examples based on matrix algebra, general economics, macroeconomics, finance, statistics and econometrics. In that sense this course will provide a different perspective to understand topics commonly taught in other economics-finance related classes.

Useful background*:

- **Mathematics:** Constraint optimization, matrix algebra.
- **Statistics:** Definition of random variables, independence, distributions and density functions, and conditional probability.
- **Econometrics:** Linear regression, time series.
- **Finance:** Risk-aversion and expected-utility theory, static mean-variance theory, Capital Asset Pricing model.

* The basics of this useful background will be covered in class.

Exams and exercises: There will be a final project. In addition, exercises will be assigned to be discussed in class.

Computer programs: The main software packages to be used are Matlab and R. Students are encouraged to buy the student version of Matlab (cost around \$100.00) and install the R and RStudio (free software).

Grading: The final grade is based on the following:

Class participation	25%
2 Exercises	25% (each)
Project	25%

Grades are earned according to the following point scale: 95 – 100 = A; 90 – 94 = A-; 87 – 89 = B+; 83 – 86 = B; 80 – 82 = B-; 77 – 79 = C+; 73 – 76 = C; 70 – 72 = C-; 60 – 69 = D; grade < 60 = F

Course Outline

Session	Lecture outline
1.	Matlab/R: Basic Features. Simple mathematical operations.
	Latex: Installation and basic features
2.	Matlab/R: Arrays and plots and subplots
3.	Matlab/R: Strings, logical operators. Introduction to linear algebra.
4.	Matlab/R: Linear algebra, for and while loops; if-else-end loops.
5.	Matlab/R: An Introduction to M-files. Data Analysis (statistical functions)
6.	Matlab/R: Working with excel data (importing and exporting). Polynomials I.
7.	Matlab/R: Polynomials II, curve fitting and interpolation. Numerical analysis.
8.	Matlab/R: Symbolic math I
9.	Matlab/R: Symbolic math II.
10.	Matlab/R: Programming with pre-coded program (OLS, multiple OLS, time series)
	Introduction to Eviews.
11.	Matlab/R: Programming with pre-coded program (economics examples)
12.	Matlab/R: Programming with pre-coded program (advanced econometric examples and portfolio analysis).

Bibliography:

Relevant material will be delivered in class