

INTRODUCTION TO MATHEMATICS FOR ECONOMICS
Department of Economics
UNIVERSIDAD CARLOS III

Theme 1: The real line. Functions of 1 variable.

- Real numbers: inequalities, intervals and absolute value.
- Functions of 1 variable. Domain, range and graph.
- Functions of 1 variable. Properties of monotonicity and existence of inverse function.

Theme 2: Limits and continuity of functions of 1 variable.

- Limits and continuity of functions of 1 variable. Asymptotes. Continuity on an interval.
- Zeroes of function. Bolzano's theorem.
- Global extrema. Weierstrass' theorem.

Theme 3: Differentiation of functions of 1 variable.

- Differentiation of functions of 1 variable. Calculus of derivatives. Implicit differentiation. First order approximation.
- Local and global extrema. Rolle's theorem and Lagrange's mean value theorem.
- L'Hopital's rule.

Theme 4: Aplicaciones de the derivative

- Taylor's polynomial of second order. Second order approximation.
- Concavity, convexity and inflection points.
- Applications to the Economy.

BASIC BIBLIOGRAPHY

- R. LARSON y B.H. EDWARDS. Cálculo 1. Ed.: McGraw Hill.
- J. STEWART. Cálculo de una variable (Volumen I). Ed.: Thompson-Paraninfo.

COMPLEMENTARY BIBLIOGRAPHY

- K. SYDSAETER, P.J. HAMMOND y A. CARVAJAL. Matemáticas para el análisis económico. Ed.: Prentice-Hall.
- V. TOMEO, I. UÑA y J. SAN MARTIN. Problemas resueltos de cálculo de una variable. Ed.: Thompson-Paraninfo.
- P. SANZ y F.J. VÁZQUEZ. Cuestiones de cálculo. Ed.: Pirámide.
- A. CHIANG. Métodos fundamentales de Economía Matemática. McGraw Hill

ASSESSMENT SYSTEM:

Basic Criterion:

Final exam common to all groups.

This exam will be graded by the teacher of the reduced group.

The weight of the final exam grade on the final grade will be of 60%.

Complementary criterion:

Class grade obtained by the teachers of the reduced and magistral group.

This grade will be obtained during the semester, by exercises resolution during the lectures.

The weight of the class grade on the final grade will be of 40%.

Subject's web page: http://www.eco.uc3m.es/docencia/matematicas_intro/