

# MATHS FOR ECONOMISTS

## EPP, M1, SCIENCES PO

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ABSTRACT. This course is devoted to make students more comfortable with basic concepts of maths for economists, to understand quantitative economics, econometrics. Students learn how to apply the mathematical concepts by manipulating concrete examples and economic models. This course adapts to the level/expectations of students.

### I. Fundamentals and one-variable calculus

Convergence of sequences and series, continuity, derivatives, Taylor's theorem, applications.

### II. Integral calculus

Definite and indefinite integrals, parameter integrals, applications.

### III. Linear algebra: some reminders

Matrices, linear maps, determinants, systems of linear equations, diagonalization.

### IV. Multivariate analysis

Metric spaces, continuity, partial derivatives, gradient, differentiability, hessian, convexity, applications.

### V. Refreshment in optimization

Unconstrained optimization, constrained optimization (Lagrangian, inequality constraints, Kuhn-Tucker conditions), applications to microeconomics.

### VI. Ordinary differential equations

General set up and Fundamental Theorem, resolution of linear scalar first and second order differential equations, systems of equations, applications.

### REFERENCES

[Peter, 2011] Peter, R. (2011). *Mathematiques pour l'economie et la gestion*. Pearson.

[Simon and Blume, 1994] Simon, C. P. and Blume, L. (1994). *Mathematics for economists*, volume 7. Norton New York.