

---

# Mathematical analysis C

## Programma

### **Curves in two or three dimensions.**

Parametrisation and representation; tangent and normal vectors; tangent hyperplanes; length of a curve; integral of a function on a curve.

### **Functions in two variables**

Graph, sections, level sets; paraboloids, cones, spherical and elliptic surfaces. Functions depending on one variable and radial functions.

### **Continuity and differentiability of functions of two or three variables.**

Elements of topology; limits, continuity, Weierstrass theorem. Differentiability and partial derivatives, directional derivatives, gradient vector, steepest ascent, extremal points; extremal points on a curve; constrained extrema. Vector valued functions and Jacobian matrix.

### **Ordinary differential equations.**

Linear differential equations of the first order, linear differential equations of higher order with constant coefficients; Cauchy problems.

### **Integral calculus of functions of two or three variables.**

Multiple integrals over normal domains in two or three dimensions. Change of variables formula. Polar, spherical and cylindrical coordinates.

### **Vector fields.**

Central fields. Integration of fields; conservative and curl-free fields.