

The Simplex Functional and its applications to Multivariate Polynomial Interpolation

Prof. Jean-Paul Calvi¹

¹ *Université Paul Sabatier, Toulouse, France.
Department of Mathematics
Email: jean-paul.calvi@math.univ-toulouse.fr*

Timetable: 16 hrs. CANCELLED

Course requirements: Functional analysis, complex analysis and numerical analysis.

Examination and grading: Seminar on a subject assigned by the teacher.

SSD: MAT/08 (Numerical Analysis) and MAT/05 (Mathematical Analysis)

Aim: to introduce the Simplex Functional and its use in multivariate interpolation. Application of the Simplex functional to error formulas for multivariate Lagrange interpolation and Kergin interpolation will be discussed.

Course contents:

- I. Definition and main properties of the Simplex functional.
- II. Application of the Simplex functional to error formulas for multivariate Lagrange interpolation (Sauer-Xu error formula, de Boor error formula for Lagrange interpolation at natural lattices).
- III. Mean value interpolations (Kergin and Hakopian). Characterization of the projectors that preserve homogeneous partial differential relations.
- IV. Approximations properties of mean value interpolation polynomials. Extremal points for Kergin and Hakopian interpolation. Approximation of entire functions.
- V. Interpolation at Leja points for the disk. Computational problems.