

# Multiobjective variational calculus

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**Timetable:** 22 hrs. First lecture on February 21, 2013, 14:00 (dates already fixed, see the calendar), Torre Archimede.

**Course requirements:** Background material will be covered by Dr. Alberto Lovison in the first two lectures.

**Examination and grading:** Oral exam with a final mark or brief essay on an argument treated during the course.

**SSD:** MAT/05

**Aim:** The course will provide an introduction to variational methods, both in the case of scalar functionals and in the vector valued case.

**Course contents:**

- The variational approach to periodic solutions of ordinary differential systems. Local extrema and critical points of scalar functionals.
- Multiobjective optimization. Pareto extrema and Pareto equilibria of vector valued functionals.
- Some basic tools of metric critical point theory: Ekeland's variational principle and weak slope.
- Some geometries to produce critical points: mountain pass, saddle and linking.