Overview no. 1

The topics for the course on optimisation will this autumn be:

- Extrema under Constraints for real-valued functions.
- Calculus of Variations.
- Optimal Control Theory.

The purpose of the course is to acquaint you with the theories, their methods and the kind *problems* they can solve (or address).

Ambitions are high in the course, inasmuch as the participants are expected to learn to *solve problems themselves, by hand*.

As you will see, the problems go far beyond what you could treat previously by setting gradients equal to zero. Phrased briefly, we shall deal with general, yet powerful methods for rewriting optimisation problems in terms of ordinary differential equations, which can be solved. But more about this later.

The course will be based on several sources:

[OC] *Optimisation under Constraints*, lecture notes.

[CF] *Convex Functions, an Elementary Approach*, lecture notes.

[SS] *Optimal control theory with economic applications,* by Atle Seierstad og Knut Sydsæter; North Holland 1987.

The book [SS] is out of print, but we have it available in the department.

It will be a central issue in this course to work through the exercises. In fact, instead of traditional exams, I will during the course hand out 5 sets of mandatory assignments, which you should complete and get approved.

(To be completed.)

Med venlig hilsen
Jon Johnsen