Program 2010-2011

First order PDE

Characteristics method

Burger equation: the crossing characteristic problem

weak derivatives/weak solution of a first order PDE

Divergence Theorem

Second order PDE:

Classification

Functionals defined on space of functions:

Examples: Brachystocrones and Catenary

Functions of one variable:

Minima and Euler Lagrange equation

Differential of a functional

Second variation of a functional

The convexity condition

Second order PDE and functionals

PDE as Euler Langrange equation of suitable functionals (defined on spaces of functions of several variables)

Examples: Laplacian and minimal surfaces