

Title: *Application of Calculus of Variations*

Author: *Antonín Bohata*

Department: *Department of Mathematics Education*

Supervisor: *doc. RNDr. Jana Stará, CSc.,*

Department of Mathematical Analysis

Abstract: The thesis deals with the calculus of variation and its applications. We recall the basic concepts from functional analysis that are needed to formulation of variational problems. Further, the simplest variational problem is discussed. In particular, we present well-known Euler's equation which is a necessary condition of a local extremum of the given functional. The results are then applied to solve various examples from geometry, physics, and economy. Some of these examples can be used to teach at secondary school.

Keywords: Euler's equation, functionals, local extrema, calculus of variation