Calculus of Variations

Wintersemester 2009/10

Alexander Mielke

Lecture times:
Monday 11:00–12:30 and 13:15-14:45 h, Room 0'311 (ESZ RUD 26)

Exercises: • turn in written solutions to exercise sheets (form small working groups)
• oral exam in last week of term

Office hours: Monday 15:00-16:00 h and after special arrangement (via e-mail)

Date for final exam (oral): 2nd of March 2010.

Literature

Functional analytic foundations: [Alt85]

Central basic works: [EkT76, Dac89, Tro96, Dac04]

Advanced material: [BaP86, Str90, BlB92, GiH96a, GiH96b]

[Alt85] H. W. Alt. *Lineare Funktionalanalysis*. Springer-Verlag, Berlin, 1985.

[BaP86] V. Barbu and T. Precupanu. *Convexity and optimization in Banach spaces*. D. Reidel Publishing Co., Dordrecht, third edition, 1986.

[BlB92] P. Blanchard and E. Brüning. *Variational methods in mathematical physics*. Texts and Monographs in Physics. Springer-Verlag, Berlin, 1992.

[Dac89] B. Dacorogna. *Direct Methods in the Calculus of Variations*. Springer-Verlag, Berlin, 1989.

[Dac04] B. Dacorogna. *Introduction to the calculus of variations*. Imperial College Press, London, 2004.

[EkT76] I. Ekeland and R. Temam. *Convex Analysis and Variational Problems*. North Holland, 1976.

[GiH96a] M. Giaquinta and S. Hildebrandt. *Calculus of Variations I. The Lagrangian Formalism*. Springer, Berlin, 1996.

[GiH96b] M. Giaquinta and S. Hildebrandt. *Calculus of Variations II. The Hamiltonian Formalism*. Springer, Berlin, 1996.

[Str90] M. Struwe. *Variational Methods. Applications to Nonlinear Partial Differential Equations and Hamiltonian Systems*. Springer-Verlag, Berlin, 1990.

[Tro96] J. L. Troutman. *Variational calculus and optimal control*. Undergraduate Texts in Mathematics. Springer-Verlag, New York, 1996.