Modulbeschreibung für Vertiefungsmodule des Wahlpflichtbereiches

Titel des Moduls	Nichtlineare Optimierung/ Nonlinear Optimization

R	X
A	

	Vorlesung	Übung
Umfang	4	2

Inhalt

0. Linar Optimization:
Existence os solutions, Duality, Simplex method (repetition, should be already known)
1. Topics of Convex Analysis:
Separation of convex sets, subdiff, duality and perturbations, saddle points...
(Proofs will be made in such a manner that the generalizations for B-space problems become obvious and can be - later - applied to optimal control).
2. Particular classical problems:
Transportation, max flow (Ford-Fulkerson), shortest ways in graphs, Matrix games, Steiner-Weber problem, ...
3. Nonconvex problems:
Linearizations and KKT-points, Regularity conditions (constraint qualifications) and related stability properties
4. Basic methods:
Penalization, barrier methods, cutting planes, feasible directions,
proximal points, computing Brouwer fixed points.
5. Newton-type methods for solving the KKT system and other complementarity problems; inner point methods.
6. Basics for problems in Banach spaces: Lyusternik theorem and Ekelands principle.

Voraussetzungen	Abschluß Modul 2. Functional Analysis is desirable, not necessary

Regelsemester	ab 5

Abschluss	Prüfung

Prüfungszulassungsvoraussetzung	Keine

Studienpunkte	10

R = Reine Mathematik
A = Angewandte Mathematik