Topic Course

Generalized convexity and Optmization

Objectives

The aim of this course is to give to students an overview of useful concepts and techniques in nonconvex analysis. In particular, quasiconvex and pseudoconvex functions will be studied during this course. The study of generalized convexity has recognized relevance in applications since the ordinary convexity is often a rigid assumption, which is not satisfied in most real-world applications. On the other hand, generalized convex functions maintain good properties and they are successfully used in several areas of science, including: scalar and vector optimization, operations research, mathematical economics, etc.
The students will be introduced to this class of functions, and then they will deal with generalized convexity methods in Optimization. The course will focus in underlining the relationship between the mathematics of generalized convex functions and its relevance to economics applications. Students might be asked to be active part in this discussion, by preparing a presentation on a pre-identified research paper.

Teaching hours
20

Syllabus

Generalized convexity (quasiconvex, semistrictly quasiconvex, strictly quasiconvex and pseudoconvex functions); characterization through the generalized monotonicity of gradient maps; economics applications; Constraint qualifications; Generalized convexity and constraint qualifications; Necessary and Sufficiency Optimality Conditions; Maxima and Generalized Convexity. Economics Applications.

Prerequisite

Course of Mathematics

Evaluation

Students are required to extend the knowledge of some topic covered during the course. Such topic will be chosen together with the lecturer during the classes. The students will give a presentation on the assigned topic. The students will also receive indications about the preparation of the presentation.

Reading/Reference

1. Genarlized Convexity and Optimizaton, Theory and Applications, Lecture Nots in Economics and Mathematical Systems, A. Cambini, L. Martein, Springer, 2009
2. Handbook of generalized convexity and generalized monotonicity, N. Hadjisavvas, S. Komlosi, S. Shaible, Springer, 2005
3. Generalized Concavity, M. Avriel, W.E. Diewert, S. Shaible, I. Zang, Siam, 1988
4. Quasiconvex programming with locally starshaped constraint region and applications to quasiconvex MPEC, D. Aussel, J. Ye, Optimization, Vol. 55, Nos. 5–6, 2006, 433–457

Further references will be provided during the course.

I periodi potrebbero essere: dal 6 al 25 Marzo 2017 oppure dal 3 al 22 Aprile 2017.