Measurability and semicontinuity of multi-functions

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Multi-functions (or set-valued functions) naturally appear in analysis and topology (for instance via inequalities, performing unions or intersections with sets indexed in another set, considering the set of points minimizing an expression, etc.) These three lectures will follow the same pattern: in each of them we will present a classical notion, then a well-known result with an application to analysis and finally we will devote part of the time to introduce the audience in some research questions connected with the topic of the lecture. The topics we will deal with are: (a) Lower semi-continuity; Michael's selection theorem; distances to spaces of continuous functions; quantitative perspective of compactness (b) Upper semicontinuity; generation of K-analytic structures: upper semi-continuity for free; WCG Banach spaces are weakly Lindelöf; a metrization result on topology obtained via functional analysis; B_1 selectors; Asplund spaces. (c) Measurability for multi-functions; Kuratowski-Ryll-Narzesdky selection theorem; integration of multifunction (Debreu and Aumann); extension to non separable Banach spaces.

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