Title of the course

Social Choice Theory

Number of hours

10 hours and 30 minutes

Teacher

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Presentation and description of the module's objectives

Social choice theory is a branch of economics that studies the methods and rules for aggregating individual preferences to make collective decisions. It explores how to combine the diverse opinions and preferences of a group of individuals into a coherent and socially acceptable choice or outcome. The goal is to understand the implications of different voting systems, decision rules, and mechanisms for achieving fair and efficient collective decision-making.

This course is focused on the use of mathematical tools to deal with social choice correspondences (SCC), social methods (SM) and two-sided matchings problems: relations, permutation groups, graphs.

- Relations and preferences. Orders and linear orders. Functions and relations. Maxima and maximal elements for a relation. Preference profiles and social choice correspondences (SCC) for a fixed set H of individuals and a fixed set A of alternatives. Properties of SCCs. Majority principles and majority graph. Weak Condorcet winners and Condorcet winners. Qualified majority and Pareto principle. Examples of SCC: Plurality, Borda, Simpson SCC. Graph interpretation of Borda and Simpson SCC.

- Anonymity and neutrality of SMs a SCCs. Its formalization through permutation groups. The natural action of the group G, given by the direct product of Sym(H) and Sym(A), on the set of preference profiles. The tension among anonymity, neutrality and resoluteness. The theorem of Moulin. Concept of partial anonymity, partial neutrality and U-symmetry for a subgroup U of G. The group theoretical characterization of the subgroups U of G for which there exists a U-symmetric and resolute SCC.

- Network methods and construction of SMs and SCCs. The Net-outdegree SMs and SCC in the context of preference profiles with individual expressing a completely free relation on the alternatives as their preferences. The Net-outdegree on particular types of preference profiles and the classic SCCs. The Schulze method and the flow network method.

- The use of group actions to model gender-fairness in matching theory.