**Syllabus of the course**

“Advances in Decision Making Theory and Applications”

Moscow, 2018

**Lecturers** – Professor, Dr. Fuad Aleskerov, Associated Professor Aleksey Myachin (National Research University Higher School of Economics and Institute of Control Sciences of Russian Academy of Sciences)

*Lectures 1* (2 hours). **Decision Making – why, when and under which circumstances?**

Main notions and phases of decision making process are presented. All notions and the process are illustrated via examples.

Lectures 2-3 (4 hours) **Aggregation Models**

Main models on multicriterial and collective decision making are given.

*Lecture 4-5* (4 hours). **Efficiency on Micromarkets. Cost-benefit Analysis**

Analysis of customers’ behavior for large network. Efficiency of bank branches. Location of branches of a firm. Efficiency of retail network. Analysis of living conditions in settlements and regions. Cost-benefit analysis.

*Lecture 6-7.* (4 hours) **In which circumstances and why political decisions are made?**

Public goods. Elections and referenda. Participation in elections. Informing voters. Party platforms and voting.

*Lectures 8-10.* (6 hours) **Voting and Manipulation in Voting**

Some excursion in history. How a voter's opinion is described? Arrow's Paradox. Sen's Paradox. Voting procedures in elections. The interchange of votes (log rolling). Voting by feet. Pattern analysis in elections. Manipulation in voting. Jerrymandering.

*Lecture 11-12.* (4 hours). **Power distribution in organizational bodies.**

Main notions. Coalitions. Classic power indices. Power indices taking into account preferences of agents to coalesce. Applications to banks, IMF, European Parliament, German Reichstag (1918-1933), Russian Duma.

Lecture 13 (2 hours). **Polarization in parliaments**

Different concepts of polarization. Analysis of polarization in Russian Duma, European Parliament, USA House of Representatives.

Lecture 14 (2 hours). How to measure the results of election?

To which extent does a parliament represent opinion of people? Different measures of representation. Examples of real parliaments.

Lectures 15-16 (4 hours). **Networks**

Classic centrality measures in networks. New centrality measures. Application of indices to migration processes, conflict networks, foreign claim networks, students’ mobility networks, etc.

Prerequisites: Math at high school level