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Contest Topics for Associate Professor

Position 61, year 2024-2025, semester 2

Disciplines: Data Analysis; Decision Support Systems; Games Theory

Data Analysis

1. Introduction to Data Analysis; examples of concrete solutions offered by specific data analysis techniques;
2. Concepts from algebra, calculus and probabilities;
3. Principal component analysis (PCA). Introduction;
4. PCA- mathematical model;
5. PCA- Properties;
6. Correspondence analysis (CA)- problem definition;
7. CA- mathematical model;
8. Factorial analysis- problem definition; examples of solutions offered by factorial analysis
9. Factorial analysis- mathematical model;
10. Unsupervized techniques. Introduction;
11. Cluster analysis - hierarchical methods; Evaluation of solutions;
12. Cluster analysis - Partitioning algorithms;
13. Technoques of Supervized learning. Introduction;
14. Elements of Bayesian analysis. Bayesian classifier;

Bibliography:

1. Siegmund Brandt, *Data Analysis, Statistical and Computational Methods for Scientists and Engineers*, Springer Cham, 2014.
2. Ruxanda G, *Analiza datelor*, Editura ASE, Bucuresti, 2001, România
3. Muraru, A., *Metode şi tehnici de analiza multidimensională a datelor*, Editura ASE, Bucuresti, 2018, România

4. Maer Matei M., *Analiza datelor cu R*, Editura Universitara, Bucuresti, 2018, România

Decision Support Systems

1. Decision Support Systems (DSS): definitions, components
2. Decision Support Systems (DSS): classifications, practical examples, examples of working with text-oriented and spreadsheet-oriented DSS
3. Data management in DSS: concepts, components, data sources, data quality dimensions, examples
4. Modeling and analysis system: components, methods and techniques of economic modeling, associations between models, objectives and modeling techniques, applicability of simulation techniques using DSS in solving economic decision-making problems

Bibliography:

1. Efraim Turban, Jay E.Aronson, Ting-Peng Liang, *Decision support systems and Intelligent systems (7th Edition),* Printice Hall International Edition, 2004.
2. Popescu Mădălina Ecaterina, Georgescu Irina, *Sisteme suport pentru decizii economice. Tehnici de analiza si modelare*, Editura ASE, București, 2016, România
3. Dobre Ion, Hartulari Carmen, *Sisteme suport pentru decizii*, Editura ASE, București, 2009, România

Games Theory

1. History and basic elements of game theory
2. Static games in complete information: Cournot duopoly, Bertrand Duopoly, Inspection game
3. Static games in complete information: Nash equilibrium, multiple equilibria, uniqueness conditions
4. Static games in complete information: normal form games, pure and mixed strategies, dominated strategies elimination algorithm, mixed strategies equilibrium
5. Dynamic games in complete information: infinite repeated games, folk theorem, Benoit-Krishna theorem.
6. Dynamic games in complete information. Pirate game, normal form of extensive form game, pure and mixed strategies equivalence

7. Dynamic games in complete information. Extensive form, backward induction algorithm, pure and mixed strategies in dynamic games.
8. Static games in incomplete information. Design mechanisms and revelation principle.
9. Static games in incomplete information. First price auctions, free rider problem, individual rationality and incentive compatibility conditions.
10. Static games in incomplete information. Description, Bayesian equilibrium, Harsanyi approach, economic applications.
11. Negotiations practice. Typology, cooperative negotiations, rational negotiations and conflict negotiations
12. Communication in negotiations. Communication barrier, verbal communication, nonverbal communication, para-verbal communication.
13. Negotiations tactics and techniques
14. Negotiations management. Negotiation team, international negotiation styles, extended negotiations

Bibliography:

1. Gibbons, R., *Game Theory for Applied Economists*, Princeton Univ. Press., New Jersey, 1992, Statele Unite ale Americii
2. Roman, M, Marin, D., Stancu , S., *Teoria Jocurilor pentru economisti*, Editura ASE, Bucuresti, 2005, România
3. Roman, M., *Jocuri si negocieri*, AISTEDA, Bucuresti, 2000, România
4. Manafi, I, Roman M.D., *Teoria jocurilor. Teorie si aplicatii*, Editura ASE, Bucuresti, 2016, România
5. Roman, M, Marin, D., Stancu , S., *Teoria Jocurilor pentru economisti*, Editura ASE, Bucuresti, 2005, România