

DEPARTAMENTO: INFORMÁTICA E MÉTODOS QUANTITATIVOS (IMQ)

CURSO: CURSO DE MESTRADO E DOUTORADO EM ADMINISTRAÇÃO DE EMPRESAS

DISCIPLINA: INTRODUCTION TO THE STRUCTURE AND ANALYSIS OF NETWORKED SYSTEMS

PROFESSORES: DR. PHOKION 'ION' GEORGIU

CRÉDITOS: 2

IDIOMA: INGLÊS (ENGLISH)

EMENTA

This course introduces the manner in which networked systems may be structured and analyzed in order to contribute to informed decision making. Networked systems are prevalent, and some applications include:

- Modeling systemic risk and financial exposure for banks and other financial institutions.
- Tracking performance and establishing processes that facilitate knowledge management, organizational learning and innovative thinking in human resource management
- Exploring supplier-customer relationships, cross-functional coordination, competitors' positioning, influences on consumers, and product diffusion processes in marketing
- Planning supply chains, service or manufacturing processes, and dependencies between projects in operations
- Balancing between centralization and decentralization, globalization and localization, collaboration and governance in organization theory and general administration
- Combining trade and investment flows with behavioral issues in economics.
- Measuring advantageous and disadvantageous redundant capacity due to inevitable functional duplications in mergers and acquisitions.
- Anticipating crowd dynamics on the internet.
- Identifying and breaking illicit connections between threats in military intelligence.
- Developing and analyzing maps of the scientific literature to guide research.

Given these diverse challenges, this course introduces the practice of design, construction, analysis and interpretation of networked systems for the administrative fields. Throughout the course, powerful network software is used accompanied by discussions of relevant studies in the field. Particular analytical aspects that students will practice include the design of relational data with non-relational attributes; cores, cliques, components, and other cohesive subgroups; multimodal and aggregate systems; various measures of system centrality; prestige and domains of influence in systems; clustering, ranking and stratification in systems; brokers, bridges, and system vulnerabilities; the modeling of diffusion behavior, exposure and critical mass processes,; as well as the identification of structural error checks and block models. By the end of the course, students will be equipped to undertake research in this field, or incorporate their knowledge into wider fields of application.

REFERENCES

- Batagelj V, Doreian P, Ferligoj A, Kejzar N (2014) *Understanding Large Temporal Networks and Spatial Networks: Exploration, Pattern Searching, Visualization and Network Evolution*. Wiley: Chichester
- Newman MEJ (2010) *Networks: An Introduction*. Oxford University Press: Oxford
- Higgins PM (2007) *Nets, Puzzles, and Postmen: An Exploration of Mathematical Connections*. Oxford University Press: Oxford
- Burt RS (1992) *Structural Holes: The Social Structure of Competition*. Harvard University Press: Cambridge
- Everton SF (2012) *Disrupting Dark Networks*. Cambridge University Press: Cambridge
- Aggarwal CC (2011) *Social Network Data Analytics*. Springer: New York