Social Networks Analysis

COURSE OUTLINE

SCHOOL	Engineering		
DEPARTMENT	Information and Electronic Engineering		
PROGRAM OF STUDY	Postgraduate		
COURSE CODE	MB203	**SEMESTER**	2st
COURSE TITLE	Social Networks Analysis		
TEACHING ACTIVITIES		**TEACHING HOURS**	**ECTS**
Lectures and Practical Exercises		3	7.5
COURSE TYPE	Science Area, Skills Development		
CORE COURSE AS PREREQUISITIVE:	No		
LANGUAGE OF TEACHING AND ASSESSMENT:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)	https://exams-iee.the.ihu.gr/course/view.php?id=77		

LEARNING OUTCOMES

Learning Outcomes

The purpose of the course is to provide knowledge related to the methods, algorithms and systems related to Social Networks, both from the point of view of the analysis of the graphs that represent Social Networks as well as from the point of view of analyzing texts published in social networks with the aim of extracting content's sentiment, and make opinion retrieval. Specifically, the student acquires knowledge about graph theory, basic network graph analysis algorithms, and text processing, specializes in the use and application of graph databases for social network analysis, applies graph analysis methods to predict links and friends, and understands, analyzes and implements text processing methods for opinion retrieval and sentiment analysis.

General Skills

- Search, analysis and synthesis of data and information, also using the necessary technologies
- Adaptation to new situations
- Decision making
- Teamwork/Partcipation in Evaluation Campaings
- Generating new research ideas
- Project planning and management
- Promotion of free, creative and inductive thinking

COURSE CONTENT

- Introductory concepts of social network analysis (Social Network Analysis)
- Graph theory, Basic concepts
- Friend Recommendation
- Establishing partners in professional networks. Concepts and algorithms
- Graph Databases
- Introduction to Graph Databases
- Exercise and examples in Graph Database "Neo4j"
- Social Network Search and Opinion Retrieval: Requests & Issues

- Machine Learning and Natural Language Processing
- Basic concepts of speech processing
- The Word2Vec method
- Applications
- Sentiment analysis
- Sentiment analysis in natural language texts, social networks and microblogs (e.g. Twitter)
- Methods and techniques of sentiment analysis.
- Network analysis of friends in Social Networks
- Link prediction: friend recommendation and follow recommendation

TEACHING AND LEARNING METHODS – ASSESSMENT

TEACHING METHODS	Traditional (Face-to-Face) Teaching and remote Teaching
USE OF ICT	Moodle, Zoom, Email Use of Computer Labs and Department Servers
LEARNING ACTIVITIES	

Activity	***Semester Workload***
Lectures	33
Laboratory exercise	6
Independent Study	70
Literature Review and Analysis	44
Project Work	72
Course Total (30 hours per credit point: 30 x 7.5 ECTS)	225

ASSESSMENT METHODS	The exam/evaluation language is Greek The evaluation criteria are accessible to students via the course page on moodle The evaluation of the students is based on the final work that they will deliver at the end of the semester. Part of the score will be the participation in the presentations of the works.

SUGGESTED BIBLIOGRAPHY

- Mark Needham and Amy E. Hodler, Graph Algorithms: Practical Examples in Apache Spark and Neo4j, O'Reilly Media, 2019, https://neo4j.com/graph-algorithms-book/
- Νικολόπουλος, Σ., Γεωργιάδης, Λ., Παληός, Λ., 2015. Αλγοριθμική θεωρία γραφημάτων. [ηλεκτρ. βιβλ.] Αθήνα: Σύνδεσμος Ελληνικών Ακαδημαϊκών Βιβλιοθηκών. Διαθέσιμο στο: http://hdl.handle.net/11419/2067
- F. Menczer, S. Fortunato and C. Davis, A First Course in Network Science, Cambridge University Press, 2020
- S. Yang, F. B. Keller, L. Zheng, Social Network Analysis: Methods and Examples, Sage publishing, 2017
- J. Scott, Social Network Analysis, Sage publishing, 2017
- Y. Goldberg, Neural Network Methods in Natural Language Processing, 2017