Course Outline

Course Code   : DBA4713
Course Title   : Network Analytics with Business Applications
Class Date   : From 12/8/2024   To 15/11/2024
Semester   : 1, Academic Year 2024-2025
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Overview

Network analytics is increasingly playing a crucial role in many business contexts. It enables the interpretation and examination of a variety of relationships, including social connections, information flows, and disease transmission. This empowers decision-makers to make informed decisions and take effective actions to optimize marketing campaigns, improve information sharing, or mitigate the spread of infectious diseases, among other applications. This course is specifically designed to introduce students to the fundamentals of networks and key techniques used to analyse network data in various business applications, including but not limited to e-commerce, network epidemics, and risk management, through hands-on practices.

Course Objectives

By the end of the course, students will be able to:
1. Understand the fundamental concepts and techniques of network analytics
2. Identify critical network problems in the social and business context
3. Visualize and summarize network data using open-source tools like Gephi
4. Apply network analysis techniques for analysing network data to solve real-world problems using R
5. Translate network/graph analysis findings into business insights to stakeholders/managers

Assessment

Assessment Components	Weightage
In-class quizzes	15%
Midterm exam	30%
Individual project	15%
Group project	40%

Schedule and Outline

Lesson/ Week	Date	Session (lesson summary or outline / learning objectives / preparation / cases & assignments / follow-up readings & resources)
1		Introduction to Network Analysis
2		Graph Theory Fundamentals
3		Network Visualization

4		Communities and Clustering
5		Social Network Analysis: Concepts
6		Social Network Analysis: Application I
7		Social Network Analysis: Application II
8		Network Applications in E-Commerce
9		Network Applications in FinTech
10		Network Applications in Healthcare
11		World Wide Web
12		Advanced Topics
13		Group Project Presentation

General Guide & Reading (e.g. Case preparation guide, project report guide, main textbook & supplementary materials, etc)

There will be no single textbook for this course. The course content will be curated from various sources. The following are recommended readings that will help the students with some of the key topics.

Barabási, A. L. (2016). Network science. Cambridge university press.
Wasserman, S., & Faust, K. (1994). Social Network Analysis: Methods and Applications. Cambridge: Cambridge University Press.

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