

37E44000 - Critical Issues in Information Systems Research D,

Lecture, 4.5.2023-24.5.2023

Network Science and Analytics

Course Description:

Networks are everywhere! From Facebook/Instagram to mobile phones to transportation, we participate in and benefit from networks daily. This course introduces the basic concepts of networks and how you can use the network science concepts in advanced data analytics projects. The class follows the EEE model of learning about advanced technologies. First, we get **Exposure** to many networks in practice and how others observe and detect them in practice and employ these for better decision making. We will learn how networks are identified, what properties can be inferred, and how these can provide insight into a problem or how these can be employed in other data science projects. Second, we will **Explore** technologies and tools to build a little bit of technical comfort in these methods through hands-on

exercises. No coding expertise is required beyond being able to use software instructions and basic scripting. Third, you will **Experience** applications of these concepts in a setting of your choice so that you have your own network story to tell. This could lead to a research project or an internal company proof of concept exploration.

Course Objectives:

Gain familiarity with network concepts and fundamentals

Understand how networks can be inferred from data

Understand how networks can help in decision making

Understand how networks can be employed in analytics

Approach:

The class follows a blended-learning approach, consisting of video-recorded lectures, class sessions, homework, a project, and various activities.

- The course is designed based on scientific and practical evidence
- You are expected to take an active role in your learning process

Structure and Content:

The course content is based on the teacher's research, and a number of other materials available online.

Assessment method:

Homework (25%)

Class Project (75%)

Class Schedule:

May 4:

10:15 – 16:00

Lectures, guest lectures, software demos, presentation by Dr Kimmo Saramaki, Founder and CEO, FNA.fi

May 5, 2023

10:15 – 16:00

Networks Intro and Software demo by Prof. Pankush Kalgotra, Auburn Univ

Guest Lecture on Network-Based Text Analytics by Prof. Ashish Gupta, Auburn

(a homework exercise will be assigned to be completed by May 8)

May 8, 2023

10:15 – 16:00

Discussion of homework assignment given by the professor.

Discussion of your project ideas and network science applications in health analytics

May 12, 19, 22

13:00 – 16:00 (In person or zoom)

Optional “Office hours” times for discussion with the professor or the teaching assistant) on the progress or issues in the projects (will be available on Zoom - link to be provided)

May 24, 2023

12:00 – 16:00 (More time may be allocated if necessary)

Final project presentations, and a report on the project due by **May 24, 2023**.

Contact:

Contact

We use MyCourses announcements as the main communication channel

- If you have any questions about the course, ask them [here](#).

If needed, you can contact us via email or book a meeting via: [Book time with Sadeghi Mostafa: Critical Issues in Information Systems Research](#) • This link will expire on: July 25, 2023

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