# ISOM 5640
# Social Media and Network Analysis

SPRING , 2022

**Department of Information Systems,**
**Business Statistics and Operation Management**

**Instructor:** Prof. Xuhu Wan, LSK Building, Room 4072, Ext.7731, imwan@ust.hk.

**Tutor:** Serafim Petrov impetrov@ust.hk
**Class meets:**

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## Course Description

**Prerequisite:** You need to have a basic knowledge of python (data types, pandas, sklearn etc).

**Main Contents:** We will discuss theoretical concepts and methods of networks, study statistical measures/analysis and economic insights of networks, build network models, discuss the networked games and markets, explore learning and information diffusion across networks, identify sentiment and topics of social media.

**Objectives:** •

- Identify important leaders and community in social network
- Learn dynamic network modeling
- Explore new pattern of games and market on network
- Learning and Information Diffusion
- Find popular topics in social community or news and the sentiment of news

## Course Materials

**A.** Reference Book: "Social and Economic Networks", Matthew O. Jackson

**B.** Lecture notes and codes in jupyter notebook

**C.** All topics and assigned projects require the installation of python package "Anaconda".

**D.** A course website (http://canvas.ust.hk ) is maintained which contains lectures notes, assignments, and links of videos and data.

## Evaluation

Your overall grade will be based on the following:

**A.** One group assignment ( 15% ):group size $\leq 4$.

**B.** One individual assignment (25% ):

**C.** In-class participation (10%)

**D.** Final(50%): The final must be done independently. You can refer to notes, books and internet, but are forbidden to communicate with other humans or AIs.

**D.** Standards for Assessment:

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|---|---|
| $A+, A, A-$ | Excellent Performance |
| $B+, B$ | Good Performance |
| $B-, C+, C$ | Marginal Performance |
| $F$ | Failure |

**Course Organization**

- Lecture 1 - Basics of Network
  - Introduction
  - Discussion: How Social commerce challenges E-Commerce
  - Building and visualizing network with networkx
  - Representing and measuring network
  - Summary statistics of networks
- Lecture 2 -Dynamic Network
  - Introduction to random graph models
  - Discussion:neuron network
  - Static network formation
  - Dynamic network formation
  - Strategic network formation
  - Diffusion through networks
- Lecture 3 -Identify Important Node
  - Centrality measure
  - Page rank
  - Influence maximization
  - Opinion leaders
  - Persuasion
- Lecture 4 -Identify Community and Social Interaction
  - Community structure, block models and latent spaces
  - Community detection
  - Density of community
  - Cascading behavior
- Lecture 5 -Learning and Networks
  - Bayesian and observational learning
  - Social influence models
  - Node classification
  - Social learning
- Lecture 6 -Decisions, Behavior and Games on Network
  - Basic game theory
  - Games in network
  - Networked markets
- Lecture 7 - Sentiment Analysis and Topic Detection in Social Media
  - Sentiment analysis
  - Statistics of topic models
  - Trend analysis
- **Final**

## Grievance Procedure

If you disagree with grades that have been assigned to your work, you have the possibility to meet instructors within one week after the grades have been published on the course website. Be specific about what it is that you don't agree with.

## Academic Integrity

Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of other groups, or tampering with the academic work of other groups. All exam answers must be your own, and you must not provide any assistance to other students during exams.