The Hebrew University of Jerusalem

Syllabus

Networks Crowds and Markets - 47711

Last update 11-08-2021

HU Credits: *4*

Degree/Cycle: *1st degree (Bachelor)*

Responsible Department: *MATAR - Interfaces of Technology, Society, and Networks*

Academic year: *0*

Semester: *2nd Semester*

Teaching Languages: *English and Hebrew*

Campus: *Mt. Scopus*

Course/Module Coordinator: *Prof. Katrina Ligett*

Coordinator Email: *katrina.ligett@mail.huji.ac.il*

Coordinator Office Hours:

Teaching Staff:

Prof Katrina Ligett,
Ms. Maya Dotan

Course/Module description:
The course combines a variety of points of view from mathematics, sociology, computer science, and economics in the analysis of human interaction over a variety of social, economic, and computerized networks.

Course/Module aims:
Introduction to quantitative and mathematical analysis of social networks

Learning outcomes - On successful completion of this module, students should be able to:
Analyze various aspects of social networks using a variety of quantitative and mathematical tools

Attendance requirements(%):
90%

Teaching arrangement and method of instruction:

Course/Module Content:
Chapter 1. Aspects of Networks
Graph Theory and Social Networks
o Chapter 2. Graphs
o Chapter 3. Strong and Weak Ties
o Chapter 4. Networks in Their Surrounding Contexts
o Chapter 5. Positive and Negative Relationships
Game Theory
o Chapter 6. Games
o Chapter 7. Evolutionary Game Theory
o Chapter 8. Modeling Network Traffic using Game Theory
o Chapter 9. Auctions
Markets and Strategic Interaction in Networks
o Chapter 10. Matching Markets
o Chapter 11. Network Models of Markets with Intermediaries
o Chapter 12. Bargaining and Power in Networks
Information Networks and the World Wide Web
o Chapter 13. The Structure of the Web
o Chapter 14. Link Analysis and Web Search

o Chapter 15. Sponsored Search Markets
Network Dynamics: Population Models
o Chapter 16. Information Cascades
o Chapter 17. Network Effects
o Chapter 18. Power Laws and Rich-Get-Richer Phenomena
Network Dynamics: Structural Models
o Chapter 19. Cascading Behavior in Networks
o Chapter 20. The Small-World Phenomenon
o Chapter 21. Epidemics
Institutions and Aggregate Behavior
o Chapter 22. Markets and Information
o Chapter 23. Voting
o Chapter 24. Property Rights

Required Reading:
Networks, Crowds, and Markets
by
David Easley and Jon Kleinberg.
Published by
Cambridge University Press 2010.

Additional Reading Material:

Course/Module evaluation:
End of year written/oral examination 80 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 20 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information: