



Course program and reading list

Semester 1 Year 2024

School: Arison School of Business B.A.

Analysis of Social Networks

Lecturer:

Dr. Moses Miller moses.miller@runi.ac.il

Teaching Assistant:

Mr. Yuval Yosef yuval.yosef@post.runi.ac.il

Course No.:	Course Type :	Weekly Hours :	Credit:
3873	Lecture	2	2

Course Requirements :	Group Code :	Language:
Final Paper	241387300	Hebrew

Prerequisites

Prerequisite:

1528 – Statistical Methods and Data Analysis II
1905 – Machine Learning Methods I



Course Description

"Because of our tendency to want what others want, and because of our inclination to see the choices of others as an efficient way to understand the world, our social networks can magnify what starts as an essentially random variation."

— Nicholas A. Christakis

Course Overview:

This course delves into the increasingly recognized role of social networking platforms, such as Facebook and Twitter, in the business world. It acknowledges the growing realization that people's decision-making processes are heavily influenced by the information they garner from others, through both direct communication and observation of behavior. In recent times, a notable number of successful ventures by Israeli firms have been rooted in the power of interpersonal social connections. Social Network Analysis, an interdisciplinary field encompassing Marketing, Computer Science, Psychology, and Sociology, offers insights into the formation, characteristics, and business implications of social influence.

The course has a dual objective. Firstly, it aims to impart a comprehensive understanding of both the theoretical underpinnings and the technical methodologies involved in analyzing social networks. This includes data collection, storage, visualization, and the interpretation of networks' statistical properties. Secondly, the course seeks to explore the business dimensions of social networks. This exploration covers a range of topics, including the mapping of various network types and forms of social influence, understanding consumer behavior and its susceptibility to influence by others, the genesis of trends and new market segments, and the dissemination of information or products across networks.

We will also examine innovative business models that companies employ to engage with and leverage social influences among consumers. Furthermore, the course will delve into emerging technological trends and the influence of a hyper-connected world on innovation and technology. This comprehensive approach aims to equip students with both a deep understanding of social network dynamics and practical insights into their application in a business context.



Course Goals

Course Objectives:

This course aims to endow students with a comprehensive understanding of social networks from a theoretical standpoint, emphasizing the integration of academic research findings within the realms of business and marketing. A significant focus will be placed on equipping students with practical skills in Social Network Analysis (SNA), encompassing both the methodologies and the software tools necessary for effective analysis.

Highlighted Topics of the Course:

1. **Exploring the Connected World:** An introductory overview of the digital interconnectedness shaping our society.
2. **Business Applications of Connectivity:** Examining how businesses leverage the connected world for strategic advantage.

3. **Impact of Mobile Connectivity:** Understanding the significance of real-time location data and its continuous flow in decision-making processes.
4. **Diversity in Social Networks:** An exploration of various types of social networks and their unique characteristics.
5. **Behavioral Influence of Social Networks:** Investigating how social networks mold individual and group behaviors.
6. **Technical Tools for Social Network Analysis:** Practical training in the use of specialized software and programming tools for analyzing social network data.
7. **Information Dynamics in Social Networks:** Studying the patterns and pathways of information dissemination within networks.
8. **Machine Learning Applications in Social Networks:** Delving into the integration of machine learning techniques in the analysis and understanding of social network dynamics.

Each topic is designed to provide a thorough understanding of both the theoretical and practical aspects of social networks, ensuring students are well-equipped to apply these concepts in various professional settings.



Grading

Course Evaluation Criteria:

Final Project Requirement: Achieving a passing grade on the final project is mandatory to pass this course. This significant project shows your comprehensive understanding and application of the course material.

Submission Guidelines and Deadlines: All coursework must be submitted via Moodle by the specified deadlines. Just so you know, late submissions will incur a penalty in terms of credit reduction and, in some cases, may not be accepted.

Assessment Breakdown:

1. **Homework Assignments (Group Submission) - 40% of Final Grade:**
 - Assignments will be assigned throughout the course, focusing on various topics covered.
 - All homework must be completed in Groups (no more than three students in a group) and submitted through Moodle.
2. **Final Project Deliverable (Group Submission) - 20% of Final Grade:**
 - This aspect involves applying the concepts and techniques learned to a practical project, showcasing your programming abilities in demonstrating course concepts on an applied problem.
 - You will define the project's scope and desired outcomes. Specific guidelines will be provided during the course.
 - The deliverable, in the form of a PDF document, must be submitted on Moodle.

3. **Final Project Defense (Individual via Zoom) - 40% of Final Grade:**

- Following submitting your final project deliverable, you will arrange a Zoom meeting with the course staff.
 - During this session, you will present a defense of your project, explaining your approach and answering questions related to your work and the course content.
-



Lecturer Office Hours

Dr. Moses (Moshik) Miller

Phone / WhatsApp – 0522810734

Email – moses.miller@runi.ac.il

Meeting: by appointment upon request.



Reading List

Optional Reading:

1. Stephen P. Borgatti et al., "Network Analysis in the Social Sciences," *Science* 323, no. 5916 (2009): 892–895, <http://science.sciencemag.org/content/323/5916/892.short>.
2. Carter T. Butts, "Revisiting the Foundations of Network Analysis," *Science* 325, no. 5939 (2009): 414, <http://science.sciencemag.org/content/325/5939/414>.
3. Scott L. Feld, "Why Your Friends Have More Friends Than You Do," *American Journal of Sociology* (1991): 1464–1477, <http://www.jstor.org/stable/2781907>.
4. Miller McPherson, Lynn Smith-Lovin, and Matthew E. Brashears, "Social Isolation in America: Changes in Core Discussion Networks over Two Decades," *American Sociological Review* 71, no. 3 (2006): 353–375, <http://asr.sagepub.com/content/71/3/353.short>.
5. Alistair Sutcliffe et al., "Relationships and the Social Brain: Integrating Psychological and Evolutionary Perspectives," *British Journal of Psychology* 103, no. 2 (2012): 149–168, <http://onlinelibrary.wiley.com/doi/10.1111/j.2044-8295.2011.02061.x/full>.
6. Nathan Eagle and Alex Sandy Pentland, "Eigenbehaviors: Identifying Structure in Routine," *Behavioral Ecology and Sociobiology* 63, no. 7 (2009): 1057–1066, <http://link.springer.com/article/10.1007/s00265-009-0739-0>.
7. Mark Newman, *Networks: An Introduction* (Oxford University Press, 2010), ch. 6. – some mathematical background
8. Christine A. Bachrach, "Culture and Demography: From Reluctant Bedfellows to Committed Partners," *Demography* 51, no. 1 (2014): 3–25, <http://link.springer.com/article/10.1007/s13524-013-0257-6>.
9. Hans-Peter Kohler et al., "The Social and the Sexual: Networks in Contemporary Demographic Research" (2013), http://repository.upenn.edu/psc_working_papers/

10. Mustafa Emirbayer, "Manifesto for a Relational Sociology," *American Journal of Sociology* 103, no. 2 (1997): 281–317, <http://www.jstor.org/stable/10.1086/231209>.
11. David Lazer et al., "Computational Social Science," *Science* 323, no. 5915 (February 2009): 721–723.
12. R. I. M. Dunbar and Susanne Shultz, "Evolution in the Social Brain," *Science* 317, no. 5843 (September 2007): 1344–1347.
13. Stanley Milgram, "The Small World Problem," *Psychology Today* 2, no. 1 (1967): 60–67, http://measure.igpp.ucla.edu/GK12-SEE-LA/Lesson_Files_09/Tina_Wey/TW_social_networks_Milgram_1967_small_world_problem.pdf.
14. Jeffrey Travers and Stanley Milgram, "An Experimental Study of the Small World Problem," *Sociometry* (1969): 425–443, <http://www.jstor.org/stable/2786545>.
15. Duncan J. Watts and Steven H. Strogatz, "Collective Dynamics of 'Small-World' Networks," *Nature* 393, no. 6684 (1998): 440–442, <http://www.nature.com/nature/journal/v393/n6684/abs/393440a0.html>.
16. Jon M. Kleinberg, "Navigation in a Small World," *Nature* 406, no. 6798 (2000): 845–845, <http://www.nature.com/nature/journal/v406/n6798/abs/406845a0.html>.
17. Duncan J. Watts, Peter Sheridan Dodds, and Mark EJ Newman, "Identity and Search in Social Networks," *Science* 296, no. 5571 (2002): 1302–1305, <http://science.sciencemag.org/content/296/5571/1302.short>.
18. Peter Sheridan Dodds, Roby Muhamad, and Duncan J. Watts, "An Experimental Study of Search in Global Social Networks," *Science* 301, no. 5634 (2003): 827–829, <http://science.sciencemag.org/content/301/5634/827.short>.
19. Brian Uzzi and Jarrett Spiro, "Collaboration and Creativity: The Small World Problem," *American Journal of Sociology* 111, no. 2 (2005): 447–504, <http://www.jstor.org/stable/10.1086/432782>.
20. Gueorgi Kossinets and Duncan J. Watts, "Empirical Analysis of an Evolving Social Network," *Science* 311, no. 5757 (2006): 88–90, <http://science.sciencemag.org/content/311/5757/88.short>.
21. Gueorgi Kossinets and Duncan J. Watts, "Origins of Homophily in an Evolving Social Network," *American Journal of Sociology* 115, no. 2 (2009): 405–450, <http://www.jstor.org/stable/10.1086/599247>.
22. Sergio Currarini, Matthew O. Jackson, and Paolo Pin, "Identifying the Roles of Race-Based Choice and Chance in High School Friendship Network Formation," *Proceedings of the National Academy of Sciences* 107, no. 11 (2010): 4857–4861, <http://www.pnas.org/content/107/11/4857.short>.
23. Jukka-Pekka Onnela et al., "Geographic Constraints on Social Network Groups," *PLoS One* 6, no. 4 (2011): e16939, <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0016939>
24. Also interesting, but we will not have time to discuss:
25. the theory/background section of this paper is an excellent review of homophily: Andreas Wimmer and Kevin Lewis, "Beyond and Below Racial Homophily: ERG Models of a Friendship Network Documented on Facebook," *American Journal of Sociology* 116, no. 2 (2010): 583–642, <http://www.jstor.org/stable/10.1086/653658>.

26. Matthew O. Jackson and Brian W. Rogers, "Meeting Strangers and Friends of Friends: How Random Are Social Networks?" *The American Economic Review* 97, no. 3 (2007): 890–915, <http://www.ingentaconnect.com/content/aea/aer/2007/00000097/00000003/art00015>.
27. Benjamin W. Domingue et al., "The Social Genome of Friends and Schoolmates in the National Longitudinal Study of Adolescent to Adult Health," *Proceedings of the National Academy of Sciences* (2018): 201711803, <http://www.pnas.org/content/early/2018/01/08/1711803115.short>.