

ICSI 445/660 – Special Topics: Network Science – Fall 2015
Course Information and Policies

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Office Hours: Mondays 3 to 4:30 PM
Wednesdays 9:30 to 11 AM

Prerequisite: Instructor's permission. (Computer Science students are expected to have basic knowledge of algorithms from a course such as ICSI 403 or ICSI 503.)

Class time and room: Tuesdays and Thursdays from 10:15 to 11:35 AM on in BB 010. (This room is in the basement of the new Business building.)

Brief course description: Various types of networks have become an important part of the society. This course will consider networks arising in many different contexts (e.g. worldwide web, viral marketing, sociology, epidemiology) and present techniques for analyzing such networks. The goal is to understand how the structure of a network influences its behavior. The course will cover the necessary background material in graph theory. Students will use a web-based tool called CINET (developed at the Network Dynamics and Simulation Science Laboratory of Virginia Tech) to analyze networks. In addition to homework exercises and assignments using CINET, each student will be expected to give a presentation based on a recent paper, prepare summaries of research papers and complete a course project or a term paper.

Text: D. Easley and J. Kleinberg, *Networks, Crowds and Markets: Reasoning About a Highly Connected World*, Cambridge University Press, 2010. A pre-publication version of the book is freely available from the following URL:

<http://www.cs.cornell.edu/home/kleinber/networks-book/>

Expected coverage: Chapters 1 through 6, 8, 13, 14, 16, 18 and 19.

Some References (partial list):

1. M. E. J. Newman, *Networks: An Introduction*, Oxford University Press, New York, NY, 2010.
2. A. Barabasi, *Network Science*, to be published by Cambridge University Press, New York, NY, 2015. An online version is available from

<http://barabasi.com/networksciencebook/>

3. T. G. Lewis, *Network Science: Theory and Applications*, John Wiley & Sons, Inc., Hoboken, NJ, 2009.

Note: Students are not required to buy the reference texts listed above. Additional research and survey papers from the literature will be added to the above list throughout the semester.

Evaluation:

- Homework exercises.
- Assignments using CINET.
- Presentation of a research paper.
- Preparing summaries of research papers.
- Course project or term paper.

Additional Notes:

- Homework exercises must be done individually.
- For CINET assignments, students may work in teams, with each team consisting of at most two students.
- Each student is required to choose a research paper and give a 20 minute presentation based on that paper. (These presentations will be during the last few classes of the semester.)
- Each student is required to submit a summary (about 500 words) of the paper that they present. In addition, each student will also be required to submit shorter (about 250 words) summaries of two papers presented by other students.
- Each student is required to carry out a course project or write a term paper. Additional requirements regarding course projects and term papers will be announced later.

Standards of Academic Integrity: Students should read and understand the University's document on "Standards of Academic Integrity" available at

http://www.albany.edu/studentconduct/standards_of_academic_integrity.php

Course website: www.albany.edu/~ravi/csi660_index.html