



Syllabus 2006 Fall Term

E2851 Advanced Networking Analysis

Textbook: Guido Caldarelli, *Scale-Free Networks: Complex Webs in Natural, Technological and Social Sciences*, Oxford University Press, 2005.
[pil.phys.uniroma1.it/~gcalda/book.html]

Instructor: Yihjia Tsai

1. Introduction to Graphs
2. Graph Structures
3. Scale-Invariance
4. Power Law Functions
5. Graph Generating Models
6. Networks in the Cell
7. Ecological Networks
8. Geophysical Networks
9. Technological Networks: Internet and WWW
10. Social Networks
11. Financial Networks

Reference:

Handbook of Graphs and Networks: From the Genome to the Internet, Stefan Bornholdt, Heinz Georg Schuster, eds., Wiley-VCH, Berlin, 2002. ISBN 3527403361.

Evolution and Structure of the Internet: A Statistical Physics Approach, Romualdo Pastor-Satorras, Alessandro Vespignani, Cambridge University Press, 2004. ISBN 0521826985.

Power Laws, Scale-Free Networks and Genome Biology, Eugene V. Koonin, Yuri I. Wolf, Georgy P. Karev, eds., Springer, 2006. ISBN 0387258833.

Statistical Mechanics of Complex Networks, Romualdo Pastor-Satorras, Miguel Rubi, Albert Diaz-Guilera, eds., Springer, 2003. ISBN 3540403728.

Modeling the Internet and the Web: Probabilistic Methods and Algorithms, Pierre Baldi, Paolo Frasconi, Padhraic Smyth, John Wiley & Sons, 2003. ISBN 0470849061.

Grading: 40% home works + quizzes, 10% attendance, 50% final report