# RANDOM GRAPHS

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Fall Semester 2010

**Course number:** 0366-4767.
**When and where:** Sundays 16-19, Ornstein 110.
**Prospective audience:** the course is intended for graduate and advanced undergraduate students in Mathematics and Computer Science.
**Informal prerequisites:** working knowledge of graph theory notions; familiarity with basic concepts in probability and linear algebra.

### Syllabus (tentative)

1. Models of random graphs and of random graph processes. Illustrative examples.
2. Random regular graphs, configuration model.
3. Appearance of the giant component.
4. Small subgraphs.
5. Long paths and Hamiltonicity.
6. Coloring problems in random graphs.
7. Eigenvalues of random graphs and their algorithmic applications.
8. Pseudo-random graphs.

### Bibliography

1. N. Alon and J. Spencer, The probabilistic method, $3^{rd}$ ed., Wiley 2008.
2. B. Bollobás, Random graphs, $2^{nd}$ ed., Cambridge University Press 2001.
3. S. Janson, T. Łuczak and A. Rucinski, Random Graphs, Wiley 2000.