MCS 549 – Mathematical Foundations of Data Science
Syllabus

Lev Reyzin

Fall 2019

Time and location: M-W-F, 1:00pm-1:50pm, Taft Hall (TH) 219

Instructor: Lev Reyzin, SEO 418, (312)-413-3745, `lreyzin@uic.edu`

Prerequisite background: Familiarity with the design and analysis of algorithms, basic computational complexity, and mathematical maturity.

Office hours: to be announced

Website: `http://homepages.math.uic.edu/~lreyzin/f19_mcs549/`

Online textbook: Avrim Blum, John Hopcroft, and Ravindran Kannan. *Foundations of Data Science*

Topics: This course covers the mathematical foundations of modern data science from a theoretical computer science perspective. Topics will include random graphs, small world phenomena, random walks, Markov chains, streaming algorithms, clustering, graphical models, singular value decomposition, and random projections.

Grading:

- 60% take-home problem sets
- 30% in-class presentation – each student will present a research paper approved by the class instructor
- 10% class participation

Problem set collaboration policy: Unless otherwise specified on an assignment, students may discuss problem sets with one another, but they should afterward write the solutions on their own. Collaborators (people you speak to about an assignment) must be named at the top of the assignment. No collaboration will be allowed on exams.

Late work policy: In general, late work will not be accepted. Problem sets are to be turned in by 1pm the day they are due, either in class or via my mailbox (on the 3rd floor of SEO). Exceptions must be asked for in advance of the due date and will be made rarely, on a case-by-case basis.

Disability policy: Students with disabilities who require accommodations for access and participation in this course must be registered with the Office of Disability Services (ODS). Please contact ODS a 312/413/-2183 (voice) or 312/413-0123 (TTY).