	Time	Location
Lecture	MW 12:25-1:40pm	E1 Rm026
Problem Session	M 11am-noon	E1 Rm026

Instructor: Robert Ellis, Assistant Professor of Applied Mathematics

Office Info: Eng. 1 Bldg. Rm. 105C, 567-5336, rellis"aht"math·iit·edu (with appropriate modification)

Office hours: Problem Session M 11am-noon. Office hours are walk-in or by appointment (Except some conferences are on some Thursdays/Fridays). Questions by email also encouraged.

Course Home Page: `http://math.iit.edu/~rellis/554S06/`

Prerequisites: Graduate status or consent of instructor

Text: *The Probabilistic Method*, Noga Alon and Joel Spencer, 2nd edition, Wiley Interscience.

Description. Graduate level introduction to probabilistic methods, including linearity of expectation, the deletion method, the second moment method and the Lovász Local Lemma. Many examples from classical results and recent research in combinatorics and graph theory will be included throughout, including from Ramsey Theory, random graphs, coding theory, and number theory

Grade Breakdown. The homework portion of the grade, 40%, is broken down as follows: 15% consists of presentations of exercises at the board, and 25% consists of written solutions to exercises and a class project with oral presentation. There will be two midterms worth 20% each, which might both include a take-home portion. The final exam is worth 20% and might include a take-home portion. The 15% consisting of presentation at the board will be graded on the expectation that each student present at least one problem per week.

Class Attendance. Successful completion of this course and mastery of the techniques therein requires uniformly good attendance. Exceptions for absolute necessity will of course be understood.

Topics. See course syllabus.

Supplemental Reading. See course announcement.

Homework and objectives. Homework will serve to sharpen students' understanding of the lecture topics through exploratory application of the techniques learned in the course. Homework assignments will be given on Wednesdays. Problems will be divided into two types: *recitation* and *written*. Recitation problems are candidates for presentation on Mondays 11am-noon or during lecture for that portion of the homework grade. Written problems are to be turned in the following Wednesday. A final project aligned with individual student's interest will be assigned later in the course.

Homework collaboration. You may conduct *oral* collaborations on the homework with the other students in the course only. This means all written materials generated during discussions must be discarded afterward, and solutions written down separately by each student. This includes both recitation and written homework problems. The justification is that learning is cemented by working a problem out step-by-step on one's own, and being led through a solution does not allow mastery. This principle applies also to assistance in office hours. I will enforce this principle strictly, so if you are unsure in a particular situation **contact me**. Copying solutions to exercises from reference materials is similarly prohibited.

Final Project. A final project is required, to be finished in the late weeks of the course and presented during the last week. The purpose of the final project is to explore a problem related to the student's research or personal interest, by formulating questions from the problem to which probabilistic methods can be applied. A previously unstudied problem will be evaluated with more latitude, but a project on a previously studied problem must be much more complete and precise, depending on the existing literature. At least one significant new avenue must be explored in the project; however, the result does not have to be "publishable." The project requires a 20 minute oral presentation and an associated written report – as long as necessary, but no shorter than 4 typed pages, including examples and computations, but not counting the list of references.