MA530 Syllabus

Instructor: William J. Martin
Office: SH 302A
Phone: 831-6764
e-mail: martin@wpi.edu
Office hours: MT 3-4
or by appointment

MA 530 – Fall 2016
Discrete Mathematics I
Text: "A Course in Combinatorics"
by J. H. van Lint and R. M. Wilson

Meetings: 5:30–8:20pm Wednesdays, SH202

Since the advent of the digital computer, discrete mathematics has emerged from its vulgar beginnings as recreational mathematics to become a vibrant, widely applied and important part of mathematics. In recent decades, what seemed like a "bag of tricks" has coalesced into a deep and powerful theory. Our intent is to sample a few of the most interesting and important topics in combinatorics, but we will give more than cursory attention to the questions we encounter. Indeed, in view of the maturity of the participants, we will have time to delve deeply into a variety of combinatorial topics of interest.

TERM SCHEDULE

Here is a rough outline of what we will cover in the 14 Wednesday evening meetings:

Part I:	Equiangular Lines	(2 weeks)	Some chapters may be covered
Part II:	Graphs and Applications Chapters 1–7	(5 weeks)	
Part III:	Combinatorial Enumeration Chapters 10–15	(5 weeks)	
Part IV:	Student Presentations Selected chapters	($\leq$ 3 weeks)	

lightly if time constraints force us to move on. Special topics, or discussions of current developments, may be added as appropriate.

WORKLOAD

Each student is expected to attend and participate in every scheduled class meeting.

Each week, a number of exercises will be assigned for students to complete on their own or in groups. Some of the problems will not be collected for credit. The for-credit problems will be further broken down into two parts: Most weeks, three written exercises will be assigned which must be written up and submitted the following Wednesday. Meanwhile, a larger number of more elementary or computational exercises will be due electronically two days after they are handed out. All problems submitted for credit are to be completed individually, without the aid of the internet or other persons.

Before Wednesday, November 30, each student will submit a project on a topic chosen from a prescribed list. This project will involve reading research papers and/or advanced monographs and must contain some detailed proofs. Every student will be expected to give an oral presentation on his or her work.

We will have a two-hour in-class midterm exam on Wednesday, October 26. There will be a comprehensive take-home final exam due on Friday, December 16.

Your grade will be based on the four activities listed above.

INFORMATION ON THE WEB

The course web page is

`http://www.wpi.edu/~martin/TEACHING/current.html`

ACADEMIC HONESTY

Each student is expected to familiarize him/herself with WPI's Academic Honesty policies which can be found at
`http://wpiacademicintegrity.weebly.com`
All acts of fabrication, plagiarism, cheating, and facilitation will be prosecuted according to the university's policy. If you are ever unsure as to whether your intended actions are considered academically honest or not, please see me.

STUDENTS WITH DISABILITIES

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Disability Services Office (DSO) as soon as possible to ensure that such accommodations are implemented in a timely fashion. The DSO is located at 157 West Street, (508) 831-4908.

If you are eligible for course adaptations or accommodations because of a disability (whether or not you choose to use these accomodations), or if you have medical information that I should know about please make an appointment with me immediately.

RESOURCES:

- *"Graph Theory with Applications"* by J. A. Bondy and U. S. R. Murty (Elsevier, 1976)
- *"Graph Theory" (2nd ed.)* by R. Diestel (Springer GTM #173, 2000)
- *"Enumerative Combinatorics, Vol. I"* by R. P. Stanley (Cambridge, 1997)
- *"Generatingfunctionology"* by H. S. Wilf (Academic Press, 1994)
- *"Designs, Graphs, Codes and their Links"* by P. J. Cameron and J. H. van Lint (Cambridge, 1991)
- *"Combinatorics: Topics, Techniques, Algorithms"* by P. J. Cameron (Cambridge, 1994)
- *"Discrete Mathematics"* by N. L. Biggs (Oxford, 1985)