

MA 524: Graduate Combinatorics
Fall 2017

Instructor: Prof. Patricia Hersh
plhersh@ncsu.edu, 515-2385
Office: 3122 SAS Hall
Office Hours: to be determined

Class Meeting Time and Location: TuTh 1:30-2:45pm, 461 Riddick Hall

Text: Enumerative Combinatorics, Volume I (second edition), by Richard Stanley

Prerequisites: MA 405 and 407 or permission of instructor

Credit hours: 3

Course Topics: Enumerative Combinatorics. More specifically: overview of methods of counting; sets and multisets; the twelve-fold way; overview of inclusion-exclusion; sign-reversing involutions and application to counting via determinants; partially ordered sets; lattices; distributive lattices; Möbius inversion and Möbius functions; R-labelings and EL-shellability; rational generating functions; reciprocity theorems for generating functions; P-partitions. The continuation course next semester will be on geometric and topological combinatorics, using the book “Lectures on Polytopes” by Günter Ziegler.

Course Schedule: Chapter 1 (3 weeks); Chapter 2 (2 weeks); Chapter 3 (6 weeks); Chapter 4 (3 weeks)

Homework: There will be recommended problems, some of which will be collected. While the book includes solutions, these are much more terse than what I will expect from you and should be regarded as hints, only to be used if necessary. If you look at these solutions, please indicate that you have done so when handing in homework. The first homework is: Chapter 1, problems 1, 2a, 2b, 3, 4a, 5a, 7, 9a, 14a, 14b, 19a, 23a

Grading: Course grades will be determined by homework (20 percent of grade), one midterm exam (30 percent of grade), and the final exam (50 percent of grade). The final exam is on Tuesday, December 5th, 1-4pm in our usual classroom. Strong class participation may also positively increase your grade by 1/3 of a letter grade.

Late policy: Late homework will not be accepted. This specifically includes late arrival to class on the day when homework is due.

Class Participation: Please do not hesitate to ask questions in class. It helps everyone!

Statement for students with disabilities: “Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Services Office at Suite 2221, Student Health Center, Campus Box 7509, 919-515-7653. For more information on NC State’s policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.01)”

Further university policies: “Students are responsible for reviewing the NC State University PRR’s which pertains to their course rights and responsibilities:”

Equal Opportunity and Non-Discrimination Policy Statement <https://policies.ncsu.edu/policy/pol-04-25-05>

Additional references at <https://oied.ncsu.edu/equity/policies/>

Code of Student Conduct <https://policies.ncsu.edu/policy/pol-11-35-01>

Grades and Grade Point Average <https://policies.ncsu.edu/regulation/reg-02-50-03>

Credit-Only Courses <https://policies.ncsu.edu/regulation/reg-02-20-15>

Audits <https://policies.ncsu.edu/regulation/reg-02-20-04>