# Math 475: Introduction to Combinatorics
## Lecture 1, MWF 8:50–9:40 a.m., B115 Van Vleck
## Syllabus for Semester II, 2013/2014

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Grader: TBA

Text: Introductory Combinatorics, 5th Edition, by Richard A. Brualdi.

**Course Content**: We will cover roughly chapters 1–8 and 14 in the text. The main topics include permutations and combinations; pigeon-hole principle; partial orders; Dilworth's theorem; the inclusion-exclusion principle; recurrence relations and generating functions; difference sequences; Catalan numbers; Stirling numbers; partition numbers; counting equivalence classes in the presence of symmetries.

**Exams and Grades**: The course grade is based on two in-class exams and the final exam. Each of the in-class exams is worth 100 points, and the final exam is worth 150 points. In addition the graded homework is worth 50 points. Here is the exam schedule:

- Exam 1: Monday, March 3 (in class)

- Exam 2: Wednesday, April 16 (in class)

- Final exam: Tuesday, May 13, at 12:25–2:25 p.m.

**Homework**: At the end of the syllabus there is a list of exercises to be handed in. These will be marked by a graduate student assigned to me. Your work on these exercises should be well presented, in good English. A clear explanation is just as important as the correct answer. It is suggested, but not required, to type your answers using for example Latex. It is fine to form a study group and discuss the exercises with your classmates; however the work you hand in should be your own and not copied from someone else. When you turn in your homework it must be a paper copy; please do not email your homework to me or the grader. Late homework will not be accepted.

**Calculator Policy**: During an exam no books, notes, calculators, cell phones, pagers, or any electronic devices will be allowed.

**How to prepare for the exams**: The list of exercises at the end of this syllabus is the minimal homework requirement; it is recommended that you do many more exercises on your own. For each exam including the final, the exam problems will be based on, and in many cases taken verbatim from, the exercises that appear at the end of the relevant chapters in the text. These exercises might not appear in the table at the end of the syllabus. Generally speaking, the more exercises from the text that you work out and understand, the easier the exam problems will seem.

**Rough Schedule**:

| Week | M | W | F |
|---|---|---|---|
| Jan 22 | Holiday | Ch 1 | Ch 2 |
| Jan 27 | Ch 2 | Ch 2 | Ch 2 |
| Feb 3 | Ch 3 | Ch 3 | Ch 3 |
| Feb 10 | Ch 4 | Ch 4 | Ch 4 |
| Feb 17 | Ch 4 | Ch 5 | Ch 5 |
| Feb 24 | Ch 5 | Ch 5 | Ch 6 |
| Mar 3 | Exam I | Ch 6 | Ch 6 |
| Mar 10 | Ch 6 | Ch 6 | Ch 7 |
| Mar 17 | | Spring Recess | |
| Mar 24 | Ch 7 | Ch 7 | Ch 7 |
| Mar 31 | Ch 7 | Ch 8 | Ch 8 |
| Apr 7 | Ch 8 | Ch 8 | Ch 8 |
| Apr 14 | Ch 8 | Exam II | Ch 14 |
| Apr 21 | Ch 14 | Ch 14 | Ch 14 |
| Apr 28 | Ch 14 | Ch 14 | Ch 14 |
| May 5 | Ch 14 | Ch 14 | Ch 14 |

**Homework assignments**:

| Chapter | Exercises | Tent. Due date |
|---|---|---|
| 1 | 3, 4, 7, 14, 17, 30, 31, 36, 43 | Not to hand in |
| 2 | 4b, 5b, 6, 7, 9, 11, 13, 14, 15, 19b, 26, 27 | Friday, Jan 31 |
| 2 | 30, 38, 39, 41, 42, 45, 55b, 60, 61, 63 | Friday, Feb 7 |
| 3 | 4, 5, 9, 10, 14, 16, 18, 20, 27, 28 | Friday, Feb 14 |
| 4 | 7b, 8, 15a, 15c, 16a, 16c, 17, 23, 24, 29, 33 | Friday, Feb 21 |
| 5 | 5, 6, 7, 12, 13, 16, 18, 23, 24, 25, 27, 28, 29 | Friday, Feb 28 |
| 5 | 8, 9, 19, 30, 31, 32, 34, 39, 40, 43, 46, 48 | Not to hand in |
| 6 | 2, 9, 12, 13, 16, 17, 21, 23, 24a, 26, 27, 28, 31 | Friday, Mar 14 |
| 7 | 8, 9, 11, 14, 15, 17, 18, 19, 21, 29, 30 | Friday Mar 28 |
| 7 | 26, 27, 28, 32, 34, 35, 36, 40, 43, 47, 48, 50 | Friday, Apr 4 |
| 8 | 1, 2, 3, 6, 7, 8, 12, 13, 14, 15, 19, 20, 26 | Friday, Apr 11 |
| 14 | 1, 11, 12, 13, 14, 18, 20, 22, 23, 24, 25, 29 | Friday Apr 25 |
| 14 | 40, 41, 43, 44, 46, 47, 48, 49, 50, 51, 52, 53 | Friday May 9 |

For the textbook a list of errata is located at `http://www.math.wisc.edu/~brualdi`