MATH 475 SYLLABUS, Fall Semester, 2007–08 Academic Year
Lec. 1, TR 9:30–10:45 AM, B105 Van Vleck Hall

Prof. Richard A. Brualdi

Office: 725 Van Vleck Hall

Text is:

Introductory Combinatorics

5th ed.NOTES, by R.A. Brualdi

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Office Hours: Mon (3:30–4:30PM), Tues. (3:00–4:00PM), Thur. (1:00–2:00PM)

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I will be distributing pdf files of updated chapters of the above book. **Copies of the 4edition of text are on reserve in the Math Library** (level B2 of Van Vleck Hall) if you want to check some of your answers to the exercises.

Course Description As the title *Introduction to Combinatorics* suggests, Math 475 is a first course with emphasis on the basics of combinatorial counting techniques, number sequences, patterns, and ordered sets. It is not however a course on what is traditionally called discrete mathematics. But we will discuss algorithms for some of the combinatorial problems considered.

Briefly, the topics covered in the course this semester include: pigeon-hole principle and applications; permutations and combinations; generating permutations and combinations; properties of binomial coefficients (combination numbers); partial orders, equivalence relations, and Dilworth's theorem; the inclusion-exclusion principle; recurrence relations and generating functions; difference sequences, Catalan numbers, Stirling numbers, partition numbers, and other counting sequences; systems of distinct representatives (marriage theorem); and counting equivalence classes in the presence of symmetries.

Study Habits This course does require considerable work. You should be devoting at least 6 hours a week outside of class to it; reading the book, thinking about the ideas, concepts, and techniques, talking with some of your classmates about them, doing all the assigned exercises, doing many of th eunassigned exercises, etc.

It is expected that students will read the book - not everything you should learn and know will be discussed in class. Of course, I will write stuff on the chalkboard but I will not write the book on the board! The class and the book will reinforce each other, and neither is a replacement for the other. Questions and comments from students are very much encouraged. It's best to do the reading assignments **before** the class in which they are discussed. In the class, we (you and I) will discuss the material - class participation is encouraged and expected.

Exercises There will be exercises to hand in (after we finish each chapter) for marking (by a graduate student grader assigned to me). **I will email you in advance to let you know which exercises are to be handed in and when.** The assignments to be handed-in have a **due date in class**; no late assignments will be accepted. Your work on these exercises - **not just the answers** - should be well-presented in good English, and not written carelessly. While you can discuss the exercises with classmates, **the work you hand in should be**

your own write-up and not copied from someone else. The assigned homework will be worth 60 points. I allow myself the possibility to increase someone's scaled homework score based on class participation.

Exams There will be **two in-class exams** during the semester, **each worth 100 points**, and a **final exam**, **worth 140 points** - see the accompanying schedule. I do not intend to give make-up exams, since it takes a long time to make up an exam.

Exam Schedule

- Exam 1 October 11 (in class).

- Exam 2 November 20 (in class).

- Final Exam: Wednesday, December 19, 5:05PM.

Grades These will be based on a **total of 400 points** according to the following standard (and exams will be constructed with this standard in min; if necessary I will adjust exam scores by adding points):

Grade	Accomplishment level	Points
A	**superior**	370 ↑
AB	**excellent**	355 ↑
B	**proficient**	330 ↑
BC	**good**	310 ↑
C	**acceptable**	275 ↑
D	**mediocre**	240 ↑
F	**unacceptable**	0 ↑

You are encouraged to form study/problem groups with your classmates; things not clear to you may become obvious when you try to explain them to others or when you hear other points of view. Sometimes just verbalizing your mathematical thoughts can deepen your understanding. As already mentioned, if you discuss with others the exercises, each person should write up her/his own version of the solution.

Rough Schedule

1. Chapter 1: introductory, very briefly.

2. Chapter 2: 1 week

3. Chapter 3: 1 1/2 weeks

4. Chapter 4: 1 week

5. Chapter 5: 1 - 1 1/2 weeks

6. **Exam 1: October 11**

7. Chapter 6: (not section 6.6), 1 1/2 weeks

8. Chapter 7: (selectively): 1 week

9. Chapter 8: (not section 8.5) 1 1/2 weeks

10. Chapter 9: (sections 9.3 and 9.4 only) 1 week

11. **Exam 2: November 20**

12. Chapter 14: 2 1/2 weeks

13. **Final Exam: December 19**

Calculator Policy: It is acceptable to use calculators on exams to do arithmetic computations, but the computations are to be exact. So an answer which has $\sqrt{2}$ in it is to be presented as such and not as 1.414.

Attendance: It is expected that each student will be present at all of the classes. Office hours are for students who need additional help beyond that given in the class; they are not substitutes for class.

Note to McBurney Disability Resource Center students: Students of the Center who are recommended for some accommodation (e.g., extended time on exams) should contact the instructor about this no later than September 16, 2005.