

MAT344 Syllabus

September 6, 2008

1 General Information

Instructor: Dilip Raghavan
Office Location: 2144 Earth Sciences Center
Email Address: raghavan@math.toronto.edu
Office Phone: 416-978-6805
Office Hours: Tuesdays and Thursdays 4–5

TA: Zuzsanna Dancso
Office Location: 1 Spadina, 209
Email Address: zsuzsi.dancso@utoronto.ca
Office Phone: 416-978-3201
Office Hours: TBA

Course Website: <http://www.math.toronto.edu/raghavan/344>

This will be the website for the course. Here I will post information about the course, such as this course syllabus, and also things like solutions to homework problems.

I will also use the University's Blackboard system. But I will use this mainly for making your grades available to you. You will be able to login through <http://portal.utoronto.ca> to view your grades on tests, and also your final grade. You will need your UTORid and password to login. Most other information about the course will be made available through the course website. There will be a link from the Blackboard site to the course website given above.

Textbook: Alan Tucker's *Applied Combinatorics*, 5th Edition, Wiley, 2007.

2 Grading Policy

Your grade in the course will be based on your performance on five quizzes, one mid-term test and the final exam. The breakdown of points is as follows:

- **Quizzes (25% of total grade):** There will be five in-class quizzes. Each quiz will be worth 25 points. Only your four best quizzes will be counted; so the quizzes will be worth a total of 100 points. Each quiz will be about 15–20 minutes.
- **Mid-term test (30% of total grade):** There will be one hour-and-half long, in-class mid-term test worth 100 points.
- **Final Exam(45% of total grade):** There will be a three hour final exam worth 150 points.

Homework: Weekly homework will be assigned. However, these assignments *will not* be collected or graded. There will a “due date” associated with each homework assignment, indicating the date by which I will expect you to have figured out how to do the assigned problems, either on your own or by asking your TA or me. As an incentive for you to do the homework, the problems on the quizzes will be similar to the homework problems. So if you know how to do *all* the homework problems, you should do well on the quizzes. After the “due date”, I will post solutions to some homework problems on the course website. I will also go over some solutions in class.

3 Some Comments

The emphasis of this course is on combinatorial problem solving; the aim is to make you good at counting things. There is not much “theory” in the course. So in contrast to many other Math courses at this level, you won’t see too many theorems and proofs in this course. The best way to get good at this material is to do lots of problems. So I will do lots of examples in class, and I will expect you to do all the homework problems.

Some of the problems we will consider are quite tricky; it is very easy to slip up, even for me or for your TA (I’m hoping we won’t do this too often). So it is important that you learn to tell the difference between good and bad combinatorial reasoning. Therefore, it is *absolutely essential* for you to give careful and complete explanations along with your solutions. There are always many different ways to approach a combinatorial problem, some correct, some not, and it is possible to end up with the correct answer by following a wrong approach. So an answer by itself is not worth much. In quizzes and exams the bulk of the credit will be assigned to your explanations. I will demonstrate what counts as a complete explanation while solving examples in class.

4 Outline of Topics

What follows is a rough outline of the topics we will cover each week. The exact sections covered will depend on how fast or how slowly we go, and so will be different.

- Week 1 (9/8–9/12): Sections 5.1 and 5.2
- Week 2 (9/15–9/19): Sections 5.2 and 5.3
- Week 3 (9/22–9/26): Sections 5.3 and 5.4
- Week 4 (9/29–10/3): Sections 5.4 and 5.5
- Week 5 (10/6–10/10): Sections 6.1 and 6.2
- Week 6 (10/13–10/17): Sections 6.2, 6.3 and 6.4
- Week 7 (10/20–10/24): Sections 6.4 and 7.1
- Week 8 (10/27–10/31): Mid-term test and section 7.2
- Week 9 (11/3–11/7): Sections 7.3 and 7.4

- Week 10 (11/10–11/14): Sections 7.5 and 8.1
- Week 11 (11/17–11/21): Section 8.2
- Week 12 (11/24–11/28): Appendix A.4 and intro. to graphs
- Week 13 (12/1–12/5): More graphs and Ramsey’s theorem for finite graphs (I will give you notes for this)

5 Mid–term and Quiz Dates

Mid–term Exam: In–class on Tuesday October 28th (10/28/2008).

Quiz Dates: Quizzes will be held in–class on Tuesdays

- Quiz 1: 9/23
- Quiz 2: 10/7
- Quiz 3: 10/21
- Quiz 4: 11/11
- Quiz 5: 11/25

6 HW for Chapters 5 and 6

- HW 1 (Due date: 9/16): section 5.1 16, 22, 23, 26, 27, 35, 37; section 5.2 16, 17, 22
- HW 2 (Due date: 9/23): section 5.2 28, 43, 54, 62, 66, 67, 72; section 5.3 4, 10
- HW 3 (Due date: 9/30): section 5.3 11, 12, 15, 16; section 5.4 5, 23, 38
- HW 4 (Due date: 10/7): section 5.4 48, 50, 60, 63, 65; section 5.5 9, 11, 19, 26, 32
- HW 5 (Due date: 10/14): section 6.1 4, 14, 16, 21, 23, 24; section 6.2 13, 19
- HW 6 (Due date: 10/21): section 6.2 23, 26, 29; section 6.3 5, 22; section 6.4 6, 10
- HW 7 (Due date: 10/28): section 6.4 12, 14; section 7.1 17, 20, 23, 27, 34, 43