

**Syllabus for MA/STA 515**  
**Linear and Combinatorial Optimization**  
**Fall 2010**

**Course:** MA515/STA515, Section 001, MWF 12:00–12:50 pm, CB 347.

**Instructor:** Carl Lee.

**Office:** 967 Patterson Office Tower.

**Mailbox:** 715 Patterson Office Tower.

**Phone:** 257-1405 (or 257-3336 to leave a message).

**Email:** lee@ms.uky.edu (preferred method for reaching me).

**Office Hours:** MWF 9:00–9:50 am, and by appointment, since I realize that this time may not be convenient for everyone.

**Text:** J.H. van Lint and R.M. Wilson, *A Course in Combinatorics*, second edition, Cambridge,

**Course Web Page:** [www.ms.uky.edu/~lee/ma515fa10/ma515fa10.html](http://www.ms.uky.edu/~lee/ma515fa10/ma515fa10.html).

**Course Description:** The discrete math group has been having some discussions about changing the topics in MA515. As a first step, I plan to test out some of these changes in the MA515 course in Fall 2010. Of course, we will adjust the prelims for the particular mathematics students taking them so that they are tested on the topics that they have in their respective classes.

There are several reasons for contemplating a change:

- The topics will be more accessible for entering graduate students (the theory of linear programming in the current course tends to take more time to develop, and also requires an immediate facility with matrix algebra, which has sometimes been a challenge).
- The topics will be narrowed a bit to allow more time to nurture “mathematical habits

of mind” such as generating examples, testing hypotheses, making conjectures, constructing and revising proofs.

- The topics will articulate better with the subject matter in MA614, and will include an introduction to some important aspects of graph theory, posets, with an early taste of enumeration.
- The topics will align a bit better with some of the current research areas of the discrete math faculty.

I am planning to use the text *A Course in Combinatorics*, Second Edition, by van Lint and Wilson. At this point I am planning to focus on the first seven chapters as the core of the course:

- Graphs
- Trees (mentioning also matroids)
- Colorings of Graphs and Ramsey’s Theorem
- Turan’s Theorem and Extremal Graphs
- Systems of Distinct Representatives (including some bipartite matching theory)
- Dilworth’s Theorem and Extremal Set Theory (introducing also partially ordered sets)
- Flows in Networks

**Attendance and Participation:** Attendance is expected. This class is designed for active involvement of the students. You will be actively supporting each other as you gain experience and understanding. Multiple ideas and points of view are important. You will benefit from hearing others’ approaches to analysis and problem solving, and they will benefit from you. So attendance and active participation are expected. If you miss a class for any reason, please explain your absence in writing as soon as possible using the Absence Report Form that I have posted on the course website (at least two weeks in advance for scheduled excused absences). Your absence will be excused if it is due to serious reason (such as illness, death in the family, or travel organized by UK—see the official list of excused absences in the “Student Right and Responsibilities,” Section 5.2.4.2,

[www.uky.edu/StudentAffairs/Code/part2.html](http://www.uky.edu/StudentAffairs/Code/part2.html)). Students absent due to an excused absence bear the responsibility of informing the instructor about their excused absence within one week following the period of the excused absence (except where prior notification is required) and of making up the missed work. The instructor shall give the student an opportunity to make up the work and/or the exams missed due to an excused absence.

**Homework:** There will be frequent homework assignments, usually assigned weekly, with specified due dates. The homework problems will have varying length and complexity. It is expected that you regularly read in detail the relevant sections in the textbook and complete all assigned work. It is fine to discuss the homework together, but you must write up your own solutions in your own words.

**Exams:** I am planning to have two in-class exams during the semester. Tentative dates: Friday, October 8 and Friday, November 5.

**Final Exam:** Wednesday, December 15, 10:30–12:30 pm, in our regular room, CB 347, although I am open to discussing the possibility of a take-home final exam.

**Grading Policy:** Your course score will be based on on the following percentages:

50%	Homework
30%	In-Class Exams
20%	Final Exam

If you are an undergraduate student, your letter grade will be determined according to the standard 10% scale:

90–100%	A
80–89%	B
70–79%	C
60–69%	D
0–59%	E

If you are a graduate student, your letter grade will be determined according to the scale:

90–100%	A
80–89%	B
70–79%	C
0–69%	E

You will receive information on your current grade after each of the exams. In particular, you will receive your midterm evaluation by the middle of the semester, Monday, October 18.

**Accommodations Due to Disability:** If you have a documented disability that requires academic accommodations, please see the instructor as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address [jkarnes@email.uky.edu](mailto:jkarnes@email.uky.edu)) for coordination of campus disability services available to students with disabilities.

**Cheating and Plagiarism:** Students are encouraged to discuss the course material together. Part of the work in class will be group work that will provide ample opportunity to exchange ideas and learn from each other. As mentioned above, discussing the homework assignments is permissible, but you must write up your solutions in your own words, and not simply copy someone else's work. Any kind of communication with other students during an exam will be considered cheating and prosecuted according to university regulations. Cheating and plagiarism can lead to significant penalties. See Sections 6.3 and 6.4 of *Student Rights and Responsibilities*, [www.uky.edu/StudentAffairs/Code/part2.html](http://www.uky.edu/StudentAffairs/Code/part2.html).

**Suggestions and Conflicts:** Suggestions for improvement are welcome at any time. Any concern about the course should be brought first to my attention. Further recourse is available through the offices of the Mathematics Department Ombud and the Department Chair, both accessible from the Main Office in 715 Patterson Office Tower.

### **Important Dates:**

August 24 — Tuesday — Last day a student may officially drop a course or cancel registration with the University Registrar for a full refund of fees

August 25 — Wednesday — First day of classes

August 31 — Tuesday — Last day to add a class for the 2010 Fall Semester

August 31 — Tuesday — Last day to officially withdraw from the University or reduce course load and receive an 80 percent refund

September 6 — Monday — Labor Day — Academic Holiday

September 15 — Wednesday — Last day to drop a course without it appearing on the student's transcript

September 22 — Wednesday — Last day to officially withdraw from the University or reduce course load and receive a 50 percent refund

October 18 — Monday — Midpoint of 2010 Fall Semester

November 5 — Friday — Last day to withdraw from the University or reduce course load. Students can withdraw or reduce course load after this date only for "urgent nonacademic reasons"

November 24—27 — Wednesday through Saturday — Thanksgiving — Academic Holidays

December 10 — Friday — Last day of classes

December 15 — Wednesday — Final exam, 10:30 am – 12:30 pm, in our regular room