Math 564 Graph Theory Fall 2008

Instructor Amites Sarkar

Text Pearls in Graph Theory (Dover Edition)
Nora Hartsfield and Gerhard Ringel

Syllabus

I'll aim to cover Sections 1.1–1.3, 2.1, 2.2, 3.1, 3.3, 4.1, 4.3, 5.2, 7.1, 7.2 (maybe), 8.1–8.4 and 9.1. I'll also cover Dirac's theorem on hamiltonicity, Hall's theorem on matchings, Menger's theorem on connectivity, and, if there's time, the proof of Vizing's theorem (page 32). (For each of these topics, I'll prepare a short accompanying handout.) There is no need to buy any other book, although I highly recommend *Modern Graph Theory* by Béla Bollobás as a reference for the more advanced material.

Notes

Graph theory is a young subject: almost everything in this course is less than 80 years old and many of the most exciting developments are really very recent. Furthermore, the basic concepts are very intuitive and all the proofs you are required to know are both short and elegant. However, understanding proofs is only half the course – the other half is solving problems. In graph theory, these are two separate skills, as you will discover. Having said that, my objective is to convince you that the subject is beautiful and interesting (and not simply difficult).

Relation to overall program goals

Among other things, this course will (i) enhance your problem-solving skills; (ii) help you recognize that a problem can have different useful representations (graphical, numerical, or symbolic); (iii) increase your appreciation of the role of mathematics in the sciences and the real world.

Final Tuesday 9 December 3:30–5:30 pm

Grading

I will base the grade on **homework** (there will be 4 homework assignments), **presentations** (you will each have to do a 30 minute presentation at the end of the quarter) and the final (which will be worth about 50%). I'm in the process of drawing up a list of presentation topics, which I'll distribute within the next 2 weeks.

Office hours

My office hours are 2–3 on Mondays, Tuesdays, Wednesdays and Fridays, in 216 Bond Hall. My phone number is 650 7569 and my e-mail is amites.sarkar@wwu.edu