

Study Sheet for the Final Exam
MAD 3305, Summer A 2014

This is only intended to cover topics after Exam 2, though the final may cover some older topics too (see my previous review sheets). I have tried for fairly complete lists, but if something seems missing, use your judgement or contact me asap. See also Prof Ram's review sheets, though the topics covered may vary slightly.

Sections covered: 6.3, 7.0 to 7.2 (omitting most of pages 210-216), 8.1 to 8.6 (but only one page each from 8.3 and 8.4). We also covered a few topics from other books; see lecture notes. But I have also listed most of these below under vocabulary, theorems, etc.

Algorithms: DMP, Aug.Path, Stable M, Network (for a max M), Greedy Coloring, Birkhoff's (about $P_G(k)$). Be able to apply these to solve standard problems. Practice each one a few times. Also, be able to solve a traffic light problem (see lecture notes or another book) by changing it to a vertex coloring problem.

Vocabulary (this list is not complete): clique number, cover, detour path, end block, genus, independent sets, internally disjoint paths, M-alt'g and M-aug'g paths, n-critical and n-minimal graphs, Petersen's graph, Q_n , regular polyhedra (list all 5), SDR, stable M, weak vertex. I may also cover a few new ones (such as *class*) in class on 6/18/14.

Proofs: I intend to emphasize longish textbooks proofs a bit less than before, in favor of some homework-level proofs, and shorter textbook ones such as these:

Birkhoff's Thm (on P_G)
Berge's Thm (on augmenting paths and max M's)
Thm.8.1.1 ($\alpha + \beta = p$)
Menger v.2.0 (the easier proof, about edges)

Less likely, but possible: Hall's Thm, Five Reg Polyhedra (this was HW actually, and it is so long that I wouldn't ask for all the details), Thm 3.1.5 (on $T \subset G$), HW.8.16 (chromatic and detour).

The other HW proofs, especially the moderately easy ones, could appear, but I won't list them all here. Also, short and easy proofs (approx 3 sentences) from the lectures are fair game.

Theorems: Know all the ones covered in class, and of course the ones already listed under Proofs. Here is a very short list, perhaps worthy of more attention:

Brook's Thm, Four Color Map Thm, $\chi_1(G)$ Thm, Konig's Thm, Menger's Thm (1 and 2), Euler's revised formula (with genus), $Z(G) \subset$ only one B_j (and the proof of this one is not too hard).