## Exam 3 Discrete Mathematics II

Exam 3 covers 8.2, 8.15-16, 13.1-5 in Zybooks.

- 8.2 Definition of recurrence relations, initial terms, how many are needed.
- 8.15 Linear homogeneous equations, characteristic equation, general solution from roots of characteristic equation, method to solve (table 8.15.1), how to handle multiple roots.
- 8.16 linear non-homogeneous equations, associated homogeneous equation, homogeneous solution and particular solution, method to solve (table 8.16.2), finding FORM of particular solution (Theorem 8.16.1).
- 13.1 Graphs and graph vocabulary (vertex, parallel edge, self-loop, simple graph, neighbor, degree, total degree, *d*-regular graph, subgraph), Theorem 13.1.1: 2 # edges = total degree, examples  $K_n$ ,  $C_n$ ,  $K_{m,n}$ ,  $Q_n$ .
- 13.2 Graph representations: pictures, edge list, adjacency list, adjacency matrix.
- 13.3 Graph isomorphism, properties preserved by graph isomorphism, degree sequence. Redrawing graph helpful to find isomorphism.
- 13.4 Walks, trails, circuits, paths and cycles. Note: contrary to the text, trails and paths are OPEN.
- 13.5 Connected components of a graph, vertex connectivity  $\kappa(G)$  and edge connectivity  $\lambda(G)$ , Theorem 13.5.1: if  $\delta(G)$  is minimal vertex degree, then  $\kappa(G) \leq \delta(G)$  and  $\lambda(G) \leq \delta(G)$ .
- Suggestions: Look over homework, quizzes, and examples from class. Checking book problems not assigned is a good idea, because I will look at them when I write the exam.