This is a short review of the material we covered for the final exam. A few pages cannot describe all aspects of a course. You are responsible for everything covered in class or in the book throughout the semester regardless of being listed in this review or not. Studying only the questions in the practice test may not be sufficient; there are many other types of questions that can be in your actual test. Learning the correct solutions of all of your HW assignments, and going through all of the examples done in the class are strongly recommended.

- 2.3, 3.3 Review Strong components and Condensation digraphs;
- Review Transitive orientation

- 3.4 Interval graphs, Theorem of Gilmore and Hoffman, cliques, the Algorithm for finding interval assignments, Handout on the course web page.

- 4.2 Eigenvalues, finding eigenvectors for left and right multiplication, use of condensation digraph for finding eigenvalues of large matrices, such as exercise 5 p.184
- 4.3, 4.4 Pulse processes, the definition, examples, and main set up (p.208-209), Theorems 4.4 and 4.5 (both in matrix and scalar forms), how to apply them in the examples. (We did not discuss the signed number of paths.)
- 4.5, 4.6 Definitions of pulse and value stability. Basic examples of stability in small digraphs. Relation of Value and pulse stability 4.5.1, p 217. Study of stability with the use of eigenvalues all of 4.5.2, Theorems 4.6-4.8, and corollary, p219-222. Many examples from 4.5 and 4.6, using 4.2 eigenvalues of large matrices. We did not discuss 4.5.3 Rosettes.

- 5.1, 5.2 Markov chains, transition digraphs, transition matrices stochastic matrices, the proof of “the product of stochastic matrices is stochastic”; Theorem 5.1 and its proof, Theorem 5.2
- 5.3 Closed sets, ergodic sets, transient sets, closed states, ergodic states, transient states, vertex contrabasis; proof of “A Markov chain is ergodic if and only if it has a strongly connected digraph”
- 5.5 Regular chains, the definition and how to determine a Markov chain is regular, Theorems 5.8, and 5.9, how to apply them, how to find the fixed probability vector w (p. 293) and how to interpret it; (First mean passage 5.5.3 is not included)

HW:
3.4 # 1, 2, 8, 9abcd, 11a
4.2 # 1-6 (not 5c), 8
4.3 # 1, 2, 7, 11
4.4 # 1, 3, 4, 5, 8, 9, 10
4.5 # 1edfg, 2edfg, 3adef, 11
4.6 # 11
5.1 # 2, 4
5.2 # 1, 2, 4, 9, 12, 15
5.3 # 1b, 2b, 4ab
5.5 # 1bd, 2cd, 3a, 4, 5, 9