Exam 2 sections G.1, G.2, G.3, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 14.1, 14.2 + Logic Problem

1. There will be a total of 20 - 25 problems on the exam. The exam will have 4 sections: Matching, Multiple Choice, Short Answer and one Logic Problem. A list of words that will be in the Matching section, sample questions for the Short Answer section and a sample Logic Problem are included on the Exam 2 Sample Questions link on the course webpage.

2. For G.1: Understand how to reduce a payoff matrix using dominance. Also, be able to set up the payoff matrix for a two-person zero sum game given a description of the game scenario.

3. For G.2: Apply the minimax criterion to a payoff matrix to determine optimal pure strategies for both players and to determine if the game is strictly determined. If the game is strictly determined, give the value of the game.

4. For G.3: Calculate the expected value of the game given a payoff matrix and the mixed strategies that each player will use. By plotting strategy lines, find the optimal mixed strategies of each player and the value of a game given a $2 \times 2$ or $2 \times n$ matrix.

5. For 3.1: Be able to identify statements, negate statements and express and negate quantified statements (all, some, no). Be able to express and negate statements symbolically and with Euler diagrams (see 3.7).

6. For 3.2: Understand the symbols used for the connectives and, or, if...then, and if and only if. Be able to translate English compound statements to symbolic form and vice versa. Understand the dominance of connectives.

7. For 3.3: Be able to construct truth tables in compound statements involving negation, conjunction and disjunction.

8. For 3.4: Be able to construct truth tables in compound statements involving the conditional and the biconditional. Understand the concept of a tautology.

9. For 3.5: Be able to write the contrapositive, converse and inverse of a statement. Be able to use truth tables to determine if two statements are equivalent. Apply De Morgan’s laws to determine equivalent statements.

10. For 3.6: Use truth tables determine the validity of an argument. Be able to translate arguments into symbolic form. You may choose to use the standard forms of arguments to determine validity (if you know them.)

11. For 3.7: Use Euler diagrams to determine the validity of arguments.

12. For 14.1: Use a preference table to determine the winner in an election using plurality method, borda count method, pairwise comparison method, or plurality-with-elimination method.

13. For 14.2: Know the four fairness criteria for voting - majority criterion, head-to-head criterion, monotonicity criterion and irrelevant alternatives criterion. Understand Arrow’s Impossibility theorem.

14. You are also allowed to bring one 8.5 by 11 piece of paper, handwritten, with whatever notes and formulas you would like on it. You may use a calculator if you desire.