## Honors Discrete Topics

*Listed by unit in order of importance for final exam*
Percentages shown reflect approximate number of questions on the final exam for each topic

1. Probability ( $24 \%, \sim 9$ questions)

- Counting Principle
- Combinations
- Permutations
- Binomial Probability
- Expected Value
- And/Or Probability
- Conditional Probability ("given that" problems)
- Tree Diagram Probability Problems
- Independent Probability
- Dependent Probability

2. Apportionment/Fair Division/Election Theory (21\%, $\sim 8$ questions)

- Hamilton Method of Apportionment
- Jefferson Method of Apportionment
- Webster Method of Apportionment
- Hill Method of Apportionment
- Ideal Ratio
- Quota
- Method of Markers
- Estate Division (Method of Sealed Bids)
- Plurality
- Borda
- Runoff
- Sequential Runoff
- Condorcet
- Approval
- Pairwise
- Banzhaf Power Index
- Shapley-Shubik Power Index
- Pivotal Players
- Critical Players
- Winning Coalitions
- Dictator
- Dummy

3. Matrices ( $18 \%, \sim 7$ questions)

- Row
- Column
- Dimensions
- Inverse
- Identity Matrix
- Scalar Multiplication
- Matrix Multiplication
- Transpose
- Leslie Model/Matrix
- Cytographry
- Decode
- Encode
- Game Theory
- Minimax
- Maximin

4. Statistics ( $15 \%, \sim 6$ questions)

- Mean
- Median
- Standard Deviation
- Skewed Right
- Skewed Left
- Symmetric
- Z-Score
- Simple Random Sample
- Cluster Sample
- Stratified Sample
- Convenience Sample
- Systematic Sample
- Census
- Survey
- Experiment
- Observational Study
- Empirical Rule
- Normal Distribution

5. Graph Theory ( $12 \%, \sim 4$ questions)

- Post-Oder
- Reverse Polish Notation
- Chromatic Number
- 4 Color Theorem
- Euler Paths and Circuits
- Hamiltonian Paths and Circuits
- Critical Paths
- Minimum Project Time
- Earliest Start Time
- Latest Start Time
- Planar Graphs
- Trees
- Vertex Coloring
- Complete Graphs
- Bipartite Graphs

6. Recursion ( $9 \%, \sim 3$ questions)

- Arithmetic
- Geometric
- Recursive Form
- Closed Form
- Sequences
- Series
- Proof by induction

