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<tr>
<td>Topics Covered for cmpe220</td>
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<tr>
<td>Midterm #1: 06.11.2018/17:00</td>
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<td>Midterm #2: 04.12.2018/17:00</td>
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<td>Final: 04.01.2019/17:00</td>
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<td>Topics SWeeks</td>
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### Logic
1. Fundamental Principles of Counting.
3. Discrete and Combinatorial Mathematics, 5e

### Sets, Relations, Functions
1. Sets and Subsets.
3. Counting and Venn Diagrams.
5. The Axioms of Probability (Optional).
7. Discrete Random Variables (Optional).
8. Summary and Historical Review.

### Relations and Functions
1. Relations and Functions.
2. Functions: Plain and One-to-One.
3. onto Functions: Stirling Numbers of the Second Kind.
4. Special Functions.
5. The Pigeonhole Principle.
6. Function Composition and Inverse Functions.
7. Combinatorial Complexity.
9. Summary and Historical Review.

### Algebra
1. Rings and Modular Arithmetic.
2. Ring Properties and Substructures.
3. The integers modulo n.
5. Summary and Historical Review.
7. Switching Functions: Disjunctive and Conjunctive Normal Forms.
10. The Structure of a Boolean Algebra (Optional).
11. Summary and Historical Review.
15. Cosets and Lagrange's Theorem.
16. The RSA Cipher (Optional).
17. Elements of Coding Theory.
18. The Hamming Metric.
19. The Parity-Check and Generator Matrices.
20. Group Codes: Decoding with Coset Leaders.
23. The Cycle Index.
25. Summary and Historical Review.

### Integers
3. Recursive Definitions.
4. The Division Algorithm: Prime Numbers.
5. The Greatest Common Divisor: The Euclidean Algorithm.
7. Summary and Historical Review.

### Combinatorics
1. Fundamental Principles of Counting.
Topics Covered for cmpe220

1. The Rules of Sum and Product.
2. Permutations.
5. The Catalan Numbers (Optional).
6. Summary and Historical Review.
9. Arrangements: Nothing is in its Right Place.
12. The Exponential Generating Functions.
14. Summary and Historical Review.
15. The First-Order Linear Recurrence Relation.
17. The Nonhomogeneous Recurrence Relation.
18. The Method of Generating Functions.
19. A Special Kind of Nonlinear Recurrence Relation (Optional).
21. Summary and Historical Review.
22. Graph Theory.
23. Definitions and Examples.
24. Subgraphs, Complements, and Graph Isomorphism.
27. Hamilton Paths and Cycles.
28. Graph Coloring and Chromatic Polynomials.
29. Summary and Historical Review.
30. Trees.
32. Rooted Trees.
33. Trees and Sorting.
34. Weighted Trees and Prefix Codes.
35. Biconnected Components and Articulation Points.
36. Summary and Historical Review.

Uncovered

6. Languages: Finite State Machines.
10. Summary and Historical Review.
11. Optimization and Matching.
15. Matching Theory.
16. Summary and Historical Review.
17. Appendices.
22. Index.