

COSC-223 Spring 2019 Midterm 1 Topics

This is a fairly complete list of topics we've covered so far in class. You (hopefully) have a lot more detail written in your notes than what appears on this page, and you are responsible for all of the course material up to this point.

- Probability on events
 - Definitions: experiment, outcome, sample space, event
 - Set operations: union, intersection, complement
 - Definitions: mutual exclusivity, partitioning
 - Three probability axioms
 - Conditional probability, chain rule for conditioning
 - Independence (2 definitions)
 - Mutual vs. pairwise independence of more than two events
 - Conditional independence
 - Law of Total Probability, Law of Total Probability for conditional probability
 - Bayes Law
- Discrete Random Variables
 - Definition: random variable (discrete vs. continuous)
 - Definition: probability mass function, cumulative distribution function
 - Examples of discrete distributions: Bernoulli(p), Binomial(n, p), Geometric(p)
 - Joint pmf
 - Independence of RVs
 - Conditioning, law of total probability applied to RVs
 - Definition: expected value
 - Linearity of expectation
 - Conditional pmf, conditional expectation
 - Variance, three properties of variance
- CS Applications
 - Caching
 - Important performance metrics
 - Direct mapped vs. fully associative
 - Cache replacement policies: Random, LRU, LFU, FIFO