- Final exam format
  - 20 multiple choice
  - 4 long answer
  - Probability tables are copied from the textbook: Poisson, Normal (+ve and -ve), t-dist^{n}
- Final course marks will be the highest marks obtained
  - When the final exam weight is 75%, or
  - When the midterm is 25% and the final exam is 50%
- Measures of centre
  - Mean = 1/n sum(x_i)
  - Median: Order from lowest to highest and find the middle position 0.5(n+1)th item
  - Mode: The value that occurs the most frequently in the data
- Measures of variability
  - Range (highest – lowest)
  - Variance: Sample (s^2) or population (sigma^2).
    - Use normal formula if given info about data
    - Compiuutation formula if data is given
  - Standard deviation: s = sqrt(s) sigma = sqrt(sigma)
- Tchebysheff's Theorum
  - At least ¾ of measurements will lie in the interval (mean – 2SD, mean + 2SD) (Can use either population values or sample).
  - At least 8/9 of measurements will lie in the interval (mean – 3SD, mean + 3SD)
  - General rule is 1 – 1/k^2
- Empirical rule (assumption: Mound-shaped)
  - mean +- 1SD contains ~ 68% of measurements
  - mean +- 2SD contains ~95% of measurements
  - mean +- 3SD contains ~99% of measurements
  - Can use either population parameters of sample estimates
- Five-number summary
  - Min, Q1, Q2, Q3, max
- IQR
  - IQR = Q3 – Q1
- Lower/upper fence
  - Lower = Q1 – 1.5IQR
  - Upper = Q3 + 1.5IQR
- Scatter plots/correlation coefficient
  - Less than 0 is a negative correlation
  - Greater than zero is a positive
  - The symbol for correlation is “r”
  - If it is approximately 0, there is no correlation.
- Above ends chapter 3
- Mutually exclusive events
  - If one event occurs, then the other cannot occur
  - This is a relationship of mutual exclusion
- Relationships
  - Union = or, intersect = and

- Addition rule
  - P(A union B) = P(A) + P(B) – P(A intersect B)
  - If A and B are mutually exclusive: P(A union B) = P(A) + P(B)
  - If A and B are independent: P(A union B) = P(A)P(B)
- Conditional probability:
  - P(A|B) = P(A intersect B)/P(B)
  - P(B|A) = P(A intersect B)/P(A)
  - If independent:
    - P(A|B) = P(A)
  - If mutually exclusive:
    - P(A|B) = 0
- If two events are mutually exclusive
  - They cannot be independent
  - Also, if they are independent then they cannot be mutually exclusive
- Baye's rule
  - Exaustive subsets of the sample space
  - P(S1 | A) = (P(A|S1)P(S1))/(P(A/S1)P(S)+P(A|S2)P(S2) + ...P(A|Sn)P(Sn))
- Binomial distribution
  - Poisson distn (lambda)
    - Expectation, Variance, probabilities
  - Hypergeometric
    - Mean, variance, probabilities (pg 21, ch 5 notes)
- Normal distribution
  - Normal approximation to binomial (with continuity correction) – page 22-29, ch 6-2 notes
- Properties of probabilities
  - Characteristics of normal distance
- Confidence interval (large sample)
  - Quantitative mean (mu)
  - binomial proportion (p)
  - Difference in quantitative mean (mu1 – mu2)
  - Difference in binomial proportion
  - See picture on phone for equations
- 1.96(s/sqrt(n)) <= B
- Identify the null and alternative hypothesis
  - Estimate test statistic
    - Quantitative mean
    - Binomial proportion
    - Difference in quantitative means
    - Difference in binomial proportion
  - Hypothesis testing confidence level
    - (1-alpha)100% confidence interval
    - Test of hypothesis significance level = alpha
  - Interpreting the confidence interval
  - Sampling distance of point estimate for all above four cases
  - All of the above for small sample quantitative mean, difference in quantitative mean

- Definitions of type I error, type II error, and power
  - Type 1 error = alpha
  - type 2 error = beta
  - Power = 1-beta