

Syllabus for Statistics 2 recruitment test

IITM Online Degree Project

1. Statistical models for data: Why have models?
Illustrative examples of how random variables model data
Correlation in data: What is correlation?
Examples of correlation in data
2. Discrete and continuous random variables: PMF, CDF, PDF, Expectations
Discrete: Uniform, Bernoulli, Binomial, Geometric, Poisson
Continuous: Exponential, Gamma, Normal
Joint, marginal, conditional distributions
3. Sampling: Samples and populations
Sampling distributions
Concepts of bias and variance
4. Statistical estimation: Estimating mean, variance, other functions
Maximum likelihood estimation
Risk minimization framework
Mean of squared error, bias-variance tradeoff
5. Statistical hypothesis testing: Null, alternate hypothesis
Type I, II errors
Tests of hypothesis, p-values
Power of a test
Two samples test, F-statistic
6. Regression: Simple linear regression
Examples