אוניברסיטת
בן-גוריון בנגב

The Department of Mathematics

2017–18–B term

Course Name Statistics for Bio-Informatics

Course Number 201.1.8041

Course web page
`https://www.math.bgu.ac.il//en/teaching/spring2018/courses/statistics-for-bio-informatics`

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Office Hours `https://www.math.bgu.ac.il/en/teaching/hours`

Abstract

Requirements and grading[1]

Course topics

Probability theory: discrete and continuous variables, independent vs dependent variables, six basic discrete distributions: Bernoulli, binomial, unfiorm, geometric, negative binomial, Poissonian. Mean, variance, moments, probability generating function. Five basic continuous distributions: unfiorm, normal, exponential, gamma, beta. Moment generating function. Events, conditional probability, aging of molecules, entropy and related concepts, scores and support. Generating various probabilities. Many random variables. EST library. Covariance and correlation, iid, minimum and maximum of many random variables.Theoretical statistics; random sampling. Classical vs Bayesian approach. Distributions of the mean and variance of the sample; methods of calculating point estimates; point estimator for the mean; point estimator for the variance; biased vs unbiased, MSE, confidence intervals for the parameters of distribution. Basic ideas and definitions for the test of the hypothesis; errors of type I and II; P-values, tests for mean values, variances and proportions; test for the goodness of fit; test of independence; correlation coefficient; and its tests; linear regression; Likelihood ratios, information and support; maximum value as test statistic. Nonparametric: Mann-Whitney and permutation tests.Bayesian approach to hypothesis testing

[1] Information may change during the first two weeks of the term. Please consult the webpage for updates

and estimation.ANOVA - analysis of variance: one-way and two-way.More theory on classical estimation: optimality aspects.BLAST.