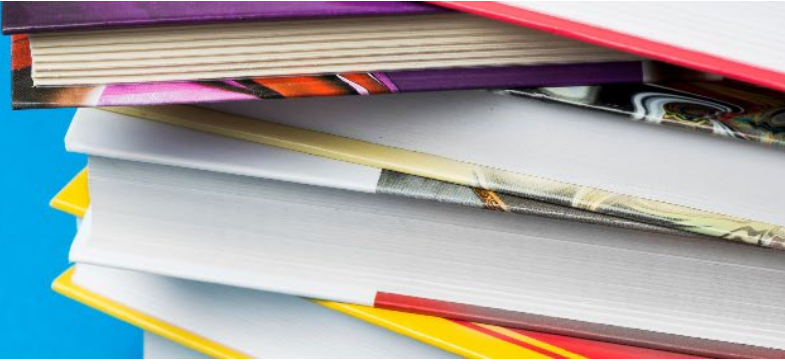
TEL AVIV UNIVERSITY אוניברסיטת תל אביב

Full Syllabus



Course Title

Biometry

Lecturer

Prof. Eli Geffen, Prof. Roi Holzman, Dr. Orr Spiegel

Semester

Fall

Course requirements

An introductory course to statistics (0455.1806)

Final grade components

Final exams and weekly homework assignments

Course schedule

Class no. / Date	Subject and Requirements (assignments, reading materials, tasks, etc.)
1	Basic concepts: populations, distributions, random sampling, frequencies, histograms, probability.
2	What is a statistic? Measures of central tendency: Mean, median, mode Measures of variability: Variance, Standard deviation, CV
3	Distributions: Normal. Binomial, Poisson, F, Chi-square
4	Special properties of the statistic: the mean. Distribution of the mean Central Limit Theorem Standard error
5	Statistical Hypothesis Testing Null hypotheses. One-sided and two-sided tests. Significance Levels.
6	Single Sample Hypothesis Tests Testing mean: z-test, t-test. Confidence Limits of mean and variance Type-I and Type-II errors Power
7	Two Sample Hypothesis Tests Testing difference between two means – two sample t-test Testing difference between two variances – F variance ratio test Unequal sampling sizes.
8	Non Parametric Statistical Methods Basic concepts - Runs Test Mann-Whitney test for difference between two means Kolmogorov-Smirnov test.
9	Test for two dependent samples: paired-sample hypotheses. T-test and Wilcoxon test
10	Analysis of variance (ANOVA) Model I, II, and mixed Multiway factorial, nested and repeated-measures designs ANOVA without replications and randomized block design Post hoc test
11	Non parametric alternatives to ANOVA (PRMANOVA, randomization tests) Kruskal-Wallis and Friedman's tests.
12	Parametric and rank correlations Pearson, Spearman and dichotomous variables correlations Comparison to Euclidean distance

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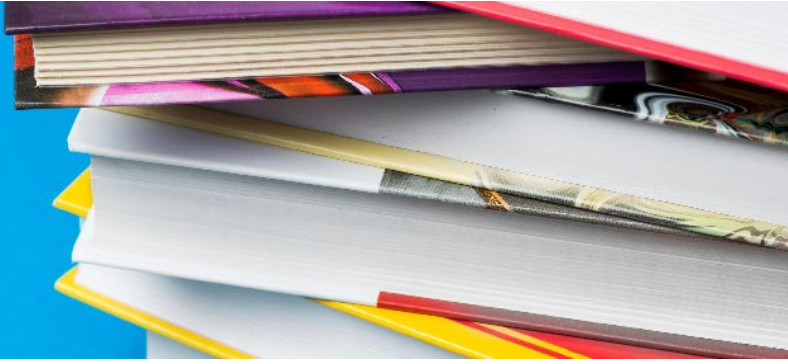

13	Linear regression Confidence intervals in regression Transformations Geometric regression
14	Multiple regression Model selection (stepwise, AIC) Sequential regression PCA (Principle Component Analysis)
15	Comparing between regression slopes Analysis of covariance (ANCOVA)
16	Analysis of frequencies Chi-square and log-likelihood ratio tests Contingency table Correspondence analysis
17	Logistic regression (Sections 10, 13-15, 17 are parts of GLM and GLMM)
18	Review on the applications of randomization, bootstrap, cross validation, and jackknife in statistics

Required course reading

Optional course reading

Comments