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Courses

Statistics 8121 Statistical Computing I
Statistics 9190 Statistical Computing II

The overall description for the two courses, with about half the material in each semester, is:

Use of computers in the solution of statistical problems. Topics include: floating point architecture, random number generation, design of statistical software, computational linear algebra, numerical integration, optimization methods, spreadsheets, interprocess communication (including ESS, RExcel, operating systems), the construction of packages of R functions, the FAQ files in R, data quality, language design (including parsing and text utilities), editors, graphics, color perception, simulation, EM, MCMC.

Term projects from the last few times I have offered the 8121 course have led to presentations at international conferences, articles submitted to refereed journals, and successful PhD dissertation proposals.

What the course is NOT: This is NOT a course on statistical methods. The prerequisite course (8003-8004) shows how to use statistical software for the analysis of data. This course (8121) discusses how the software systems are themselves constructed and how they work.

Statistics 8107 Design of Experiments I

Principles of experimental designs, completely randomized designs, multiple comparisons, randomized block design, latin square design, missing value problems, analysis of covariance, and factorial experiments.

Statistics 8003 Statistical Methods I

A prior course in applied statistics, essentially the standard introductory course that is part of most undergraduate programs (Stat 2022 at Temple), is a prerequisite for Stat 8003. My basic working mathematics assumption is a knowledge of algebra, elementary differential calculus (use of derivatives to find maxima and minima), and elementary matrix operations (including eigenvalues and eigenvectors). I expect students enrolled to have some aptitude in mathematical areas, and if deficient in background, to be willing to take extra time in the beginning of Stat 8003 to acquire additional background.

Introduction to frequently used methods. Includes probability, estimation, tests of hypothesis, survey sampling, linear regression data analysis, statistical computer packages.

Statistics 8004 Statistical Methods II

Introduction to multiple regression, analysis of variance, design of experiments, robust techniques, analysis of covariance, nonparametric analysis, and multivariate analysis. Statistical packages such as R and SAS are used. Prerequisite: Stat 8003.

Statistics 8102 Statistical Methods III

Linear and non-linear mixed effects modelling, generalized linear models, missing values, survival analysis, multivariate analysis, Bayesian statistics, data mining, spatial techniques, neural networks. Prerequisite: Stat 8004.