Courses in Statistics for Doctoral Students in Psychology

According to the 2015-2016 graduate catalog, all doctoral students in Psychology must complete PSYC 6430 and PSYC 7431. Those in Pediatric School Psychology must complete a third course in statistics and research design, either PSYC 7433 or another approved course.

Graduate Statistics Courses in Psychology and in Biostatistics

PSYC 6327 - Methods in Human Measurement 3 ch

P: Statistics course or consent of chair. Rationale and techniques of psychological measurement. Advanced estimates of reliability and validity, questionnaire and test construction, and fair employment procedures.

PSYC 6430 - Statistics and Research Design 3 ch

2 classroom and 3 lab hours per week. P: Consent of chair. Inferential statistical application and research methodologies.

This is an exceptionally lame catalog description. The course typically covers the basics of research design, descriptive statistics, basic probability, logic of parameter estimation of hypothesis testing, testing hypotheses about means and variances (including t tests and one-way ANOVA), univariate and bivariate applications of chi-square (including contingency table analysis), linear and monotonic bivariate correlation and regression (with a brief introduction to multiple correlation/regression), and an introduction to factorial ANOVA. SAS is the primary statistical software employed, but the students are also introduced to SPSS and R.

PSYC 7431 - Advanced Research Design 3 ch

P: Consent of chair and PSYC 6430 or equivalent (inferential) statistics course. Introduces multivariate analysis and research design. to students preparing to engage in research.

This course covers in detail factorial ANOVA and multiple regression, and also introduces the students to the basics of multivariate statistics. Nonparametric methods and resampling methods are also covered. SAS, SPSS, and R statistical packages are used in this course.

BIOS 7021 is an acceptable substitute for the PSYC 6430 prerequisite.

PSYC 7433 - Multivariate Statistical Analysis 3 ch

P: PSYC 7431 or consent of chair. Computation and interpretation of multivariate statistical analyses.

This course continues coverage of multiple regression, with emphasis on logistic regression, mediation analysis, moderation analysis, and conditional process analysis. Students then select which of a variety of other multivariate statistics to be covered. The menu includes components and

factor analysis, structural equation modeling, cluster analysis, discriminant function analysis, multiple analysis of variance, correlated samples analysis of variance (both univariate and multivariate approaches), canonical correlation, analysis of multidimensional contingency tables, and least squares analysis of variance and analysis of covariance.

BIOS 7022 is an acceptable substitute for the PSYC 7431 prerequisite.

PSYC 7505 - Structural Equation and Hierarchical Linear Modeling 3 ch

P: PSYC 7433 or consent of program director or chair. Computation and interpretation of causal and multi-level statistical models.

The instructor, Alex Schoemann, has told me he is willing to waive all prerequisites for any student who has a basic understanding of linear correlation/regression models and a strong drive to learn structural equation modeling and hierarchical linear modeling. Dr. Schoemann uses R in his courses.

BIOS 7021 - Biostatistics for Health Professionals I 3 ch

P: MATH 1065 or consent of instructor. Applies statistical methods to health sciences. Types, organization, and display of data; elementary probability; parametric and nonparametric techniques when dealing with one or two samples (matched and independent); one way ANOVA; and simple linear regression.

The topics covered in this course are much the same as those covered in PSYC 6430. Jason Brinkley advised me, in February of 2013, that they use JMP in this class. Students in PSYC who substitute this course for PSYC 6430 will be expected to learn basic SAS, SPSS, and R on their own prior to taking PSYC 7431/7433. Jason added "SAS isn't generally taught in any of our grad courses. But the non 7021 classes are still up to individual instructors."]

BIOS 7022 - Biostatistics for Health Professionals II 3 ch

P: BIOS 7021 with a grade of B or better or consent of instructor. Continuation of BIOS 7021. Topics include ANOVA for multi-factor designs and analysis of single degree of freedom contrasts; randomized block and repeated measures designs; nonparametric methods for standard designs; multiple linear and logistic regression; and chi-square analysis of contingency tables.

The topics covered in this course are similar to those covered in PSYC 7431.

BIOS 7501 - Experimental Design 3 ch

P: BIOS 7021 or equivalent with a grade of B or better or consent of instructor. Experimental designs and their analysis. Topics include completely randomized, randomized block, Latin square, and split-

unit designs; factorial treatment structures and repeated measures designs; multiple comparison procedures; tests of normality and homogeneity of variance; measures of effect size; and power considerations.

This course does not match up well with any in PSYC, although it covers some of the topics we cover in PSYC 6430, 7431, and 7433.

BIOS 7550 - Applied Multivariate Analysis 3 ch

P: BIOS 7021 or equivalent with a grade of B or better or consent of instructor. Overview of the most commonly used multivariate statistical techniques. Topics include Hotelling's T-square, MANOVA, discriminant analysis, cluster analysis, principal components, factor analysis, canonical correlation, multidimensional scaling, and correspondence analysis.

The topics covered in this course are very similar to those covered in PSYC 7433.

BIOS 7560 - Nonparametric Statistical Methods 3 ch

P: BIOS 7021 or equivalent with a grade of B or better or consent of instructor. Statistical methods requiring less restrictive assumptions (than parametric methods) about the form of the population distribution. General linear rank statistics, tests and estimation of location, dispersion, regression, and association in the nonparametric setting.

Psychology does not have a course devoted to nonparametric methods.

BIOS 7570 - Introduction to Survival Analysis 3 ch

P: BIOS 7021 or equivalent with a grade of B or better or consent of instructor. Statistical methods for time-to-event data, including censoring, hazard rates, estimation of survival curves, and methods to compare survival curves. Applications to clinical trials.

Psychology does not cover survival analysis in its stats courses, but this course is recommended for our doctoral students in clinical health psychology, expecially if they anticipate being involved in research where survival analysis would be an appropriate statistical method.

BIOS 7580 - Categorical Data Analysis 3 ch

P: BIOS 7021 or equivalent with a grade of B or better or consent of instructor. Introduction to the analysis of categorized data; rates, ratios, and proportions; relative risk and odds ratio; Cochran-Mantel- Haenszel procedure; life table methods; linear models for categorical data. Applications in demography, epidemiology, and medicine.

Psychology does not have an equivalent course, although some of the topics here are covered in our stats courses.

Visit Wuensch's Statistical Resources Page