

Appendix 5
Overview of Statistical Methods in Education: Version 3 of 5-14-08

<u>Parametric Methods</u>	<u>Available Course(s) at Penn</u>
LINEAR MODELS	
Descriptive statistics for univariate distributions	EDUC 667, SOC 535/6 sequence
Bivariate Correlation and Regression	EDUC 667, SOC 535/6 sequence
Sampling error, statistical significance, and effect size	EDUC 667, SOC 535/6 sequence
t-tests and chi-square tests	EDUC 667, SOC 535/6 sequence
Multivariate Regression	EDUC 767, STAT 500
ANOVA	EDUC 767, STAT 500

NONLINEAR MODELS	
Logistic Regression	EDUC 881, SOC 612, STAT 501
Log-linear Models	STAT 501
Probit Models	SOC 612, ECON 705
Exponential Models	n/a
Event History/Survival Analysis	SOC 613*

* Course last offered Fall semester 2005

MULTIVARIATE MODELS	
Latent Trait Models	
Factor Analysis (Common Unwgt LS, Components)	EDUC 771
Factor Analysis (Confirmatory SEM)	EDUC 771
Factor Analysis (Full information, Bifactor)	EDUC 768
Factor Analysis (Scale level)	EDUC 881
Structural Equation Modeling	n/a
Traditional Multivariate Models	
MANOVA/MANCOVA	EDUC 881
Repeated Measures ANOVA/ANCOVA	EDUC 880
Trend Analysis	EDUC 880
Multiple Regression	EDUC 767, EDUC 881
Canonical Correlation	EDUC 881
Cluster Analysis	EDUC 881
Multiple Discriminant Analysis	EDUC 881
Latent Class Models	EDUC 881
Mixed Models	
Repeated Measures	EDUC 880
Time Series Models	EDUC 880
Growth Models	EDUC 880

** SOC 611 last offered Spring semester 2003

MULTILEVEL MODELS	
Hierarchical Linear Models	EDUC 880
Individual Growth-Curve Models	EDUC 880
Higher-Order Models	EDUC 880
Multiple-Group Models	EDUC 880
Generalized Linear Models	EDUC 880
Nonlinear Models	EDUC 880
Fixed Effects Models	EDUC 880

MEASUREMENT	
Introductory True-Score	EDUC 684
Advanced True-Score (Test Construction, Equating, DIF)	EDUC 768
Item Response Theory (Models, Equating, DIF)	EDUC 768
Scale Development (Item Analysis, Scaling, Invariance, Bias)	EDUC 771
Survey Methods & Design	EDUC 683/STAT 502, STAT 920
Geographic Information Systems	ENVS 541, CPLN 666

THEORY	
Causal Inference	EDUC 880
Bayesian Methods	STAT 542
Psychometrics	EDUC 684, EDUC 768, EDUC 771
Pre-Experimental Design	EDUC 880
Experimental Design	EDUC 880, EDUC 871
Quasi-Experimental Design	EDUC 880
Program Evaluation	EDUC 680

<u>Nonparametric Methods</u>	<u>Available Course(s) at Penn</u>
Sign-Rank	STAT 501
Rank-Sum	STAT 501
Additional nonparametric tests: Ansari-Bradley, Lepage, Kolmogorov-Smirnov, Kruskal-Wallis, Theil's, etc.	STAT 501