COURSE SYLLABUS

Psychology 594

Multivariate Analysis in Psychology and Education

Fall, 2013

Instructor: Teaching Assistant:

Lawrence Hubert   Justin Kern

433 Psychology Building   418 Psychology Building

Office Hours: Wednesday 2–4   TBA

Lectures: Wednesday and Friday 12-2

29 Psychology Building

Course material is placed at:

`http://cda.psych.uiuc.edu/multivariate_fall_2013`

Additional sessions:

a) randomization tests (for neuroscience applications in particular)

See: Thomas E. Nichols and Andrew P. Holmes, Nonparametric Permutation Tests for Functional Neuroimaging: A Primer with Examples, Human Brain Mapping, 2001, 15, 1–25

b) Truman Lee Kelley talk plus handout

Four Chapters from: A Statistical Guide for the Ethically Perplexed, Lawrence Hubert and Howard Wainer, Chapman & Hall, 2013

1) Correlation (Chapter 5)

2) Prediction (Chapter 6)

3) Basic Sampling Model (Chapter 7)

4) Simpson's Paradox (Chapter 12) [for multivariate categorical data]

Tentative Topic Sequence:

topic	*reading*
I. Introduction/Matrix Algebra	Matrix Algebra Notes
II. Matlab Introduction	Matlab Primer (online)
	Slide Handouts
III. Random Vectors/Matrices, Linear Combinations, Random Sampling	Handout Notes
IV. Multivariate Normal Distributions	Handout Notes
V. Principal Components	Handout Notes
VI. Factor Analysis	Handout Notes
VI. Canonical Correlation	Handout Notes
VI. Discrimination/Classification	Handout Notes
VII. Classification and Regression Trees	Handout Notes
VIII. Clustering/Scaling Proximity Representation	My Matlab Toolboxes
Multivariate Methods with R (if time permits)	Slide Handouts