5104 (Lundquist)

Chi-Squared Test
t-test and confidence intervals
1,2,3-Factor ANOVA
Effect Size and Power
Correlation
Multiple comparisons (planned/post-hoc tests)
ANCOVA, Mixed Designs
Hands-on component in SPSS

5105 (Chen)

Simple regression (hands-on in excel?)
Multiple regression
Partial correlations
Mediation (w/ little bit of power analysis)
Path models, Multiple regression
Categorical data
Moderation
Hands-on component in SPSS/R?

Logitudinal Data Analysis (Dixon)

Growth-curve modeling and event-history analysis
Multi-level Models
Hands-on component in R

Neural Data Analysis (Stevenson)

Frequency Analysis
Supervised Learning (classification and regression – GLMs, Naïve Bayes)
Unsupervised Learning (PCA, ICA, Isomap, k-means, MoGs)
Information Theory, Bayesian Methods
Specific: Neural coding, Voltage models of single neurons
Hands-on component in Matlab (students have option for Python or R)

fMRI Data Analysis (BIRC)

Hands-on component in specialized software

Language Corpus Analysis (Ramirez-Esparza)

Specific: linguistic inquiry word count, emotion, lying, meaning, linguistic style
Hands-on component using specific tools LIWC, Note excel, Kfngrams, Wordle

Meta-Analysis (Johnson)

Searching the Literature
Evaluating the Literature; Coding Studies
Computing Effect Sizes (and Managing Databases)
Analysis of Meta-Analytic Databases
Interpreting Meta-Analytic Results

Data Science (Paxton)

Data science
Statistics, ethics, methods, experimental + natural data
Scientific and statistical programming (Hands on: R, Python)

Applied Time Series Analysis (Frank)

Stochastic processes
Markov chains, Iterative Maps
Master equation
Continuous time models (Fokker-Planck)
Hands-on component in Matlab

Synergetics and Complex Systems (Frank)

ODEs and Nonlinear differential Equations
1/2D bifurcations theory
Pattern formation and self-organization
Order-parameters and phase transitions
Hands-on component in Matlab

Intro Nonlinear Dynamics (Large)

Intro to Dynamical Systems Theory
1-d, 2-d systems
Bifurcations
Oscillatory Dynamical Systems

Programming Complex Systems (Tabor)

Dynamical Systems, self-organization
Cellular Automata, Power Laws, Fractals, Bifurcations
Hands-on component in Python/Matlab, Language Corpora

Neural Synchrony (Tabor)

Neural Synchrony Phenomena   (Hands on: Matlab, Python, R)
Oscillatory Dynamical Systems
Theory of Grammar, Computation, Artificial Neural Networks
Discrete/Continuous Relation, Symbolic Dynamics, Poincare Maps

Multivariate…Survey Data (Magley)

Data management
Construct measurement
Discriminant function analysis
k-means clustering
Moderation vs Mediation
SEM, MLM

Research Design (Milan)

Reliability, internal and external validity
Sampling and bias, Statistical power
Measurement
Mediation, moderation
SEM, Meta-analysis

Measurement and Scaling (Green)

Unidimensional scaling techniques (Thurstone, Likert, latent class)
PCA, Factor Analysis
Multidimensional scaling
Cluster analysis, Correspondence Analysis

EPSY 6611 Hierarchical Linear Modeling
EPSY 6615 Structural Equation Modeling
EPSY 6651 Causal Inference
EPSY 6637 Item Response Theory

Connectionist Models (Rueckl)

Intro to Connectionist (Artificial Neural Network) Models
Computational Modeling
Gradient descent learning
Connectionist models of reading