Weeks 1-2
1. Data organization and management
   • best practices, reproducibility, etc.
2. Basic programming fundamentals for data curation
   • The Unix environment and fundamental commands
   • Formatting and manipulating tabular text files from the terminal
3. Introduction to R and Rstudio
   • Installation/Updates
   • R object types and assignment
4. Practice with R objects
   • vectors, matrices, data frames, etc.
5. Applying core programming fundamentals in R
   • vectorized operations
   • replicate, apply family, ifelse, for loops, etc.

Week 3
1. Plotting/visualizing data as a means of exploration
   • Different plot types
   • Scale, transformations, etc.
2. Fundamentals of plotting in base R
   • par
   • using palettes, points, sizes, etc. to convey information
   • axes and labels
3. R markdown

Week 4
1. Population parameters, samples, and sampling distributions
   • Central Limit Theorem and the normal dist.
   • Mean and st. dev.
2. Probability and probability distributions
3. Calculating summary statistics
   • Other common summary statistics (quantiles, etc.)

Week 5
1. Parameter estimation
   • Simulating data sets with known parameters
   • Revisit probability distributions
2. Uncertainty in estimation
   • Parametric and nonparametric approaches to uncertainty
Week 6
1. Experimental design
   • lexicon
   • considering sources of variance
   • types of variables (categorical, ordinal, rational)
   • confounding variables
2. Frequentist hypothesis testing
   • error types
   • p-values
   • degrees of freedom
   • statistical power
   • multiple testing problem

Week 7
1. Comparing means between groups
   • Student’s t-test
2. Bootstrapping and randomization to compare means

Week 8
1. Relationships between quantitative variables
   • correlation and covariance
2. Simple linear regression
   • residuals and least squares
   • fitting linear regression models

Week 9
1. Analysis of variance
   • Table components and test statistics
2. General linear models in R
   • Model formulae
   • Interpretation of summary output
3. More complex ANOVA frameworks
   • Nested models
   • Factorial models

Week 10
1. Frequency-based statistical tests
   • Chi-squared tests
   • Contingency tables and tests of independence
2. Brief introduction to generalized linear models (time permitting)
   • logistic regression