Introduction to R: **Outline**

Day 1

R Basics

- What is R?
- RStudio interface
- Packages
- R as calculator
- Anatomy of a function
- Help files
- R scripts

Vectors

- Objects
- Basic classes
- Creating vectors
- Testing/coercing classes
- Missing values
- Relational operators
- Math on vectors
- Summary statistics
- Indexing
- Factors
- Matrices & arrays
- Reassignment

Data Frames

- Composition of a data frame
- Viewing a data frame
- Selecting columns
- Creating columns
- Modifying columns
- Removing columns
- Selecting rows
- Removing rows

String Functions

- Pasting
- Pattern matching
- Substitution
- Regular expressions
- Other string commands

Day 2

Data Management

- Loading data
- Renaming variables
- Sorting

- Adding additional rows
- Adding additional columns
- Saving data
- Managing the work space

Reshaping

- Data shapes
- Reshape long with `melt()`
- Reshape wide with `dcast()`

Aggregation

- Aggregation functions
- Aggregating with `dcast()`
- Aggregation vs reshape with `dcast()`

Day 3

`ggplot2` Graphics

- Understanding the `ggplot` approach
- Aesthetics
- Geoms
- Facets
- Options and customization
- Reshaping
- Saving plots
- Additional packages

Linear Regression

- Linear regression in a nutshell
- Why do regression?
- How to do regression
- Useful things you can do with regressions
- Problems and common pitfalls
- Other forms of regression models

Day 4

Control Flow

- `if`/`else` statements
- Assertions
- `for` loops
- `break` and `next`
- `while` loops

Functions

- Viewing function code
- Defining functions
- Scoping
- Lists
- `apply()` and `lapply()`

Wrap Up

- Writing an R script
- Running an R script
- Getting help