

P9489 applications of epidemiologic methods II

what to expect

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course blueprint

Basic Structure

- Lecture - Exercise
or "*Flip*" ...
- Assessment - Questions - Exercises - Lecture (NEW!!)
- Break
- (Discussion/Lecture/Exercises)

About the "Flipped" Sessions

- View Screencasts at Home
- 2 or 3 Question Assessment
- Spend more classtime working in R

About the Exercises

- Illustrate material from lecture
- Introduce new material
- Get you used to "thinking in R"
- First half contributes to grade

About the final project

- R "Vignette"
- Presentations final 3 weeks
- Paper last class

- all the material is on my website
- except for the material that's not
 - syllabus
 - correspondence
 - announcements

let's look at the syllabus...

broad overview of the course

- Part 1
 - introduction
 - foundations
 - function
 - packages
 - graphics
 - data
 - variables
- Part 2 (for discussion)
 - power
 - web/online data
 - bayes (multilevel, hierarchical)
 - spatial
 - meta-analysis

1.1

A Gentle Introduction

- About R
 - Some things people are doing with R
- Installing
- Using R
 - Calculating, Assigning, Combining
 - From Calculations to Programming
- Data
- R Packages
- Workspaces and Packages

1.2

A Foundation for Understanding R: Objects and Data

- Objects
- Vectors
 - Logical Vectors
- Matrix
- Array
- List
- Data Frame
 - Indexing Data Frames
- Data
 - Getting Your Data Into R

1.3

How R "Works" for Epidemiologists: Functions (and more indexing)

- Functions for Epidemiologists
 - *apply()* - marginals
 - *tapply()*, *by()*, *aggregate()* - stratified analysis
 - *sweep()* - summary statistics
 - *table()* - cross tabulations
- Indexing to Manipulate Data
 - position
 - logical
 - indexing matrices and arrays
 - indexing lists and data frames

1.4

Getting the most out of R: Functions and Packages for Epidemiologists

- Functions
- Packages
 - Linear Regression
- Epidemiology Packages
 - epitools
 - epicalc
- From Risks to Rates
 - Survival Tools for Epidemiologists

1.5

Eye Candy: R Graphics

- Some things you can do with R graphics
- Graphic basics
 - about graphing parameters
- Graphing Examples
 - Syphilis
 - An Epidemic Curve
 - Time Series with Confidence Limits
 - Comparison Bar Plots
- ggplot2

1.6

ins and outs of data

- functions for data
 - editing
 - merging data frames
 - subsetting
 - re-orienting
- missing values (NA)
- working with files
 - saving data sets
 - working from external code
- DBMS interfaces

1.7

odds and ends

- categorical data (factors)
- working with dates and time
- searching and replacing ("grep")

Part 2

let's talk...