**CUNY School of Public Health**

**Hunter College**

**Silberman School of Social Work**

**Room C-05**

Introduction to R (1.5 credits)

EPI 70N0601

Tuesdays and Thursdays 6:00 PM – 9:00 PM

June 2 – June 23

Marcel Ramos, MPH

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COURSE DESCRIPTION

This 1.5 credit course is a brief, hands-on introduction to the R statistical programming language. Topics covered will include basic operations such as importing data, data manipulation, class coercion, graphing, data analysis, and reproducible research. This course will emphasize practical applications of the R program rather than teaching statistical concepts.

COURSE LEARNING OBJECTIVES

At the end of this course, participants will be able to:

* Be able to recognize the basic features of the R language (help pages, error messages, classes, and functions)
* Import and export several types of data from a file
* Manipulate data to create, filter, and select variables and cases
* Create basic visual representations of data
* Understand the common functions for data analysis
* Produce reports as results from statistical analyses

STUDENT GRADING AND ASSESSMENT

Student grades will be based on:

Attendance (15%)

Quizzes (20%)

Exercises (65%)

Attendance and class participation:

This is an interactive and hands-on class in which lectures are followed by the opportunity for participants to write, and execute code with the help of the instructor. Attendance is necessary in order to absorb the material presented. Class participation – asking questions, providing code alternatives, etc. – is highly encouraged and will result in a better class for all students.

Quizzes:

Brief quizzes covering material from the current session as well as previous sessions will be periodically given.

Exercises:

In order for the material to be retained, students must write and execute code themselves. As with any language, R takes practice and repetition. With enough familiarity, a student will be able to write code without looking at examples. Exercises provide the opportunity to write running code and at the same time, to get familiar with the language.

Searching for help and troubleshooting R code are crucial components to learning the R language. R will be frustrating to learn. Students are not expected to write functioning code on the first attempt. Students are encouraged to challenge themselves when troubleshooting code. Exercises will be done at the end of each class and the instructor will help answer questions. Although students should work on exercises individually, it is reasonable for students to provide assistance to others. Too much assistance may sometimes be counter-productive to a student’s learning objectives and therefore, help should be provided after all self-help options have been exhausted.

The final course grade will be determined using the School’s letter grade system. Grades are: **A, B, C**, with **+** and **–** as applicable. Grades are defined as follows:

A+ Excellent - exceptional achievement.

A Excellent - outstanding achievement.

A- Superb - close to outstanding.

B+ Very good. Solid achievement expected of most graduate students.

B Good. Acceptable achievement.

B- Acceptable achievement, but below what is generally expected of graduate students.

C+ Fair achievement, above minimally acceptable level.

C Fair achievement, but only minimally acceptable.

C- Very low performance.

F Failure.

RECOMMENDED TEXTS

There is no required text for this class.

COURSE SCHEDULE

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| **Date** | **Topics** | **Assessment material** |
| Thursday, June 2nd, 2016  Session 1 | Introductions  About  Features of the R Language  Getting help and troubleshooting | Exercise |
| Tuesday, June 7th, 2016  Session 2 | Importing/Exporting Data  Classes and data types  Factors – Reference groups  data.frames  Subsetting | Exercise and quiz |
| Thursday, June 9th, 2016  Session 3 | Data manipulation  Summarizing data  Merging  Binning of variables  Adding columns | Exercise and quiz |
| Tuesday, June 14th, 2016  Session 4 | Exploratory Data Analysis  Plots (base graphics)  Introduction to ggplot2  Saving graphics | Exercise and quiz |
| Thursday, June 16th, 2016  Session 5 | Functions for repetitive code  Using “for” loops  apply family  Functionals | Exercise and quiz |
| Tuesday, June 21st, 2016  Session 6 | Data analysis  Frequencies  Odds ratios  Logistic regression  Linear regression | Exercise |