

## **EDH 7916: CONTEMPORARY RESEARCH IN HIGHER EDUCATION SUMMER C 2020**

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Class Meeting Time	Online (asynchronous)
Class Location	NRN 1-239
Office Hours	By appointment

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### **COURSE DESCRIPTION**

Higher education researchers have a wide variety of quantitative tools at their disposal. Yet as the number and sophistication of these tools grows, so too do expectations about the quality of final analyses. Furthermore, increasing scrutiny of non-replicable results demands that researchers follow a proper workflow to mitigate errors. In this course, students will learn the fundamentals of a quantitative research workflow and apply these lessons using common open-source tools. We will cover project organization, data cleaning, and exploratory analyses as well as how to run basic econometric models and recover estimates for publication. Throughout, students will use coding best-practices so that their workflow may be shared and easily reproduced.

### **COURSE OBJECTIVES**

Students will learn:

1. To use a number of tools that are useful for conducting applied quantitative research
2. To properly organize a project for maximum clarity and reproducibility
3. Best practices for cleaning/tidying/wrangling raw data into analysis-ready data

### **REQUIRED TOOLS, SOFTWARE, AND REGISTRATIONS**

You will need access to a computer. It does not matter whether you use a MacOS, Windows, or Linux-based operating system; however, your machine needs to be up to date and in good running order. It needs to be able to connect to the internet and you need to be able to install software (*i.e.*, have administrator privileges).

All software that we'll use in the course is freely available. You need to download and install the following software on your machine (choose the version appropriate for your operating system):

- R : [cran.r-project.org](http://cran.r-project.org)
- RStudio : [rstudio.com](http://rstudio.com)

You'll also need a distribution of LaTeX. You have two options:

- **Recommended small install** tinytex R package
- **Optional full install** latex-project.org

Finally, you also need to sign up for a free GitHub account: [github.com/join](https://github.com/join). You should sign up using your University of Florida email address (or another .edu address) so that you can request a Education discount at [education.github.com/benefits](https://education.github.com/benefits).

## TEXTS

### Required

All necessary materials are available on the course website ([edquant.github.io/edh7916/](https://edquant.github.io/edh7916/)), on Canvas, or can be downloaded from external sources. There are no required text books.

### Recommended

You may find some of the following books / online resources helpful:

Wickham, H., & Grolemund, G. (2017). *R for data science*. O'Reilly Media.

Healy, K. (2018). *Data visualization: A practical introduction*. Princeton University Press.

## ASSIGNMENTS

**Problem sets (50%):** Every lesson module will have an associated set of questions that must be answered and submitted. You may work together and/or use online resources to solve the problem sets, but everyone must submit their own work and do their best to give accurate attribution for borrowed/repurposed code. There will be one problem set for each of ten (10) lessons, with each set worth 5% of the final grade. In general, problem set answers will need to be submitted via Canvas **two (2) weeks** after they are assigned.

There are four (4) supplemental lessons — two before the mid-course break and two after — that will include supplemental assignments. Though these are not required, you may find them useful. You may replace up to two (2) problem set submissions with submissions from the supplemental assignments. Please note that the supplemental assignments may be more difficult than the normal problem set assignments.

**Reproducible report (50%):** Everyone must produce a 3-5 page report on a higher education topic of interest. The report should be a combination of writing, tables, and figures, have minimal citations (if any), and be fully reproducible with minimal effort. You must use data that is either publicly available or that can be shared with others (no IRB restrictions). Everyone will submit three preliminary assignments in addition to the final report. Each product is worth the following percentage of the final grade:

- Proposal (5%)
- Initial set of analyses (15%)

- Draft of final report (15%)
- Final report (15%)

## **GRADING**

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Grades are assigned in accordance with current UF grading policies, which may be found here:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.asp>

## **HONOR CODE**

UF students are bound by The Honor Pledge which states,

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.”

The Honor Code (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

## **ACCOMMODATIONS**

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

## **COURSE EVALUATIONS**

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

## TENTATIVE SCHEDULE

Because this is an asynchronous online course, you have a fair amount of flexibility in how you complete lessons and assignments. That said, the course will have an overlapping two-week flow that you will need to follow.

**First week:** In the first week, you will be expected to complete the lesson by reading the text and working through the code on your own computer. Each lesson will include a video (or set of videos) on Canvas in which I talk through the lesson and code. You are not required to watch the videos, but I encourage it.

**Second week:** In the second week, I will have open office hours via Zoom (TBD) during which I will answer questions you have about the prior week's lesson and/or assignment. Though I am happy to meet, I expect that before you come to me with questions — coding questions in particular — you will have completed the lesson, watched the relevant videos, and spent some time troubleshooting on your own. Your assignment is due by **11:59 p.m.** at the end of the week (due dates below).

In the schedule below, items are marked as follows:

- > Required for you to do
- < Required for you to submit
- + Optional

### Week 1 (May 11)

#### LESSON 1

- > Course welcome
- > Getting and installing required software
- > Introduction to R
- > Introduction to Markdown

### Week 2 (May 18)

#### LESSON 2

- > Organizing a script and project directory
- + **Supplemental:** Getting higher education data from common sources

#### ASSIGNMENT (MAY 24)

- < Assignment 1

**Week 3 (May 25)**

LESSON 3

- > Data wrangling I: Enter the Tidyverse
- + **Supplemental:** Data wrangling with base R

ASSIGNMENT (MAY 31)

- < Assignment 2
- < Final project: proposal

**Week 4 (June 1)**

LESSON 4

- > Data wrangling II: Appending, joining, and reshaping data

ASSIGNMENT (JUNE 7)

- < Assignment 3

**Week 5 (June 8)**

LESSON 5

- > Data visualization with ggplot

ASSIGNMENT (JUNE 14)

- < Assignment 4

**Week 6 (June 15)**

LESSON 6

- > Creating research reports with RMarkdown

ASSIGNMENT (JUNE 21)

- < Assignment 5
- < Supplemental problem sets so far (if any)

— TWO WEEK BREAK (June 22 – July 5) —

**Week 7 (July 6)**

LESSON 7

- > Data wrangling III: Working with strings and dates

ASSIGNMENT (JULY 12)

- < Assignment 6
- < Final project: initial set of analyses

**Week 8 (July 13)**

LESSON 8

- > Inferential tests and models

ASSIGNMENT (JULY 19)

- < Assignment 7

**Week 9 (July 20)**

LESSON 9

- > Functional programming

ASSIGNMENT (JULY 26)

- < Assignment 8

**Week 10 (July 27)**

LESSON 10

- > Data wrangling IV: A philosophy of data cleaning

ASSIGNMENT (AUGUST 2)

- < Assignment 9
- < Final project: draft of final report

**Week 11 (August 3)**

LESSON

+ **Supplemental:** Interactive graphics

ASSIGNMENT (AUGUST 9)

< Assignment 10

**Week 12 (August 10)**

LESSON

+ **Supplemental:** Webscraping

ASSIGNMENT (AUGUST 14)

< Final project: final report

< Supplemental problem sets from after the break (if any)