R Shiny for Operations & GIS Syllabus

# Course Overview

Instructor

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Office Location

Dept. of Innovation & Performance

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Teacher’s Assistant

[Name]

Office Hours

[Hours,  
Days]

# This course will teach students to generate interactive websites including GIS maps and other data visualizations and reports using the R programming language, RStudio’s Shiny web application framework for creating interactive web applications, and the Leaflet open-source JavaScript library for mobile-friendly mobile interactive maps. While Heinz College offers courses on R, none focus on the Shiny package. There is also, there is no GIS course on using open-source software. This course builds directly from its prerequisite course, Programming R for Analytics course, and offers students a chance to build skills that will be marketable in both the public and the private sectors. Students will learn to load data from a variety of sources and formats for use in interactive web interfaces that can provide real-time information.

# Course Materials

* Students will require a laptop capable of running R and R Studio for this course.
* Free user accounts for [GitHub](https://github.com/) and <shinyapps.io>.
* There is no required text for this course, but supplemental websites and materials will be provided.

# Learning Objectives

* To provide relevant and up-to-date applications for clients/customers students will learn how to query and extract data from online application program interfaces in R.
* How to use R to generate interactive charts, maps and graphs.
* How to create, customize and deploy R Shiny web applications

# Attendance

Attendance is not taken or required for this course.

# Resources

Students will be required to find their own data for the two major projects in this course. Below are a few online portals that students may find useful for their projects.

* <http://www.wprdc.org/>
* <https://data.world/>
* <https://www.data.gov/>
* <https://www.census.gov/data.html>
* <https://datasf.org/opendata/>
* <https://data.cityofchicago.org/>

# Course Schedule

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| Week | Subject | Packages |
| 1 | Basic Concepts of R and Shiny Apps | github, shiny, shinydashboard |
| 2 | Inputs, Outputs, Filtering Reactive Functions and UI Updates | shiny |
| 3 | Creating Flexdashboards using Shiny & R Markdown | Flexdashboard, rmarkdown |
| 4 | Data Tables and Downloads | DT |
| 5 | Leaflet for R | leaflet, leaflet.extras |
| 6 | Downloading from API’s & Course Evaluations | httr |
| 7 | Guest Lecture & In Class Project Help |  |
| 8 | Finals Week – Work on Final Project |  |

# Homework Schedule

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| --- | --- |
| Week | Assignment |
| 1 | Homework 1 – Building a UI |
| 2 | Homework 2 – Filtering a Plot |
| 4 | Project 1 – Creating a Dashboard |
| 5 | Homework 3 – Static Map |
| 8 | Final Project – Interactive Map using an API |

# Homework Policy

# There will 2 graded projects and 3 homework assignments with the lowest homework grade will be dropped, but understanding the concepts in each Homework will be imperative to complete the larger projects. Each student will be required to submit their own code for assignments but working with a partner or group is encouraged.

# All assignments and projects must be turned in Friday of the week they are due at 11:59pm.