# Stat 5014 Fall 2020 Syllabus

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Syllabus for STAT 5014, Fall 2020.

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| 9:00-10:00 a.m. | Wednesday, Zoom Office Hours |
|---|---|
| CRN: | 90035 |
| Office: | Zoom |
| Email: | rsettlag@vt.edu |
| Office hours: | W 9-10, Zoom and by appointment |
| Course Website: | https://github.com/rsettlage/STAT_5014_Fall_2020 |

**Text book**

There is no required text book for this course. Although, if you were to read just one, I would suggest Hadley Wickam's R for Data Science (https://r4ds.had.co.nz/). Other resources that may be helpful: Google, your classmates, NLI (https://nli.tlos.vt.edu), SAIG short courses.

**Required software (all free, install in order if you want a local install)**

In this class, we will use a Rstudio. For all my demos etc, I will use Rstudio.cloud (https://rstudio.cloud) or Rstudio via Advanced Research Computing (ARC) at VT. For early material, you will need an Rstudio.cloud account. This is a free resource within the computing limits we will need for this course.

If you choose to use ARC, you need:
1) an account at arc.vt.edu – requests – account
2) you can access the clusters at https://ondemand.arc.vt.edu
3) choose the Rstudio app on Dragonstooth (allocation=stat5014-fall20, partition=interactive_q)

Things you will need:

| Package | Source |
|---|---|
| Git: | https://git-scm.com/ |
| Github: | https://github.com (account) |
| LaTeX: | https://miktex.org/ |
| R: | https://cran.r-project.org/ |
| Rstudio: | https://rstudio.cloud (http://rstudio.com/) |

Note, on some platforms, LaTeX seems to be a royal PITA usually due to a previous installation. If you have troubles, try installing the R package *tinytex*. In this class, you are required to knit direct to pdf. To test this, do "File -> New File -> R Markdown", choose the PDF toggle, click "ok", then simply "Knit to pdf". If this works, you are good to go.

**Grading:**

Grading based on assigned homework and project.

**Grading details:**

Homework will be assigned as per the class schedule (see Canvas) and accessible via the course git repository. Feel free to discuss assignments with other students, but the work handed in must be exclusively your own unless otherwise noted. Each assignment must be neatly typed in Rmarkdown in formal, correct English. Note that after the first assignement, ALL assignments will be accessible and searchable on the web. As such, treat these assignments as your first public work. Homework is graded as pass/fail. To pass the course, you must pass 4/5 of the homeworks plus pass the team project.

**Course details**

This course endeavors to build competence in R programming, LaTeXtypsetting and concepts of Reproducible Research. To accomplish this, we will use Swirl and/or Rstudio.cloud primers to reinforce the programming concepts and Rmarkdown for document typesetting. In the process of working through this course, you will also gain familiarity with version control (git). The course will include, but is not restricted to, the following programming topics:

- R, Rmarkdown, Rnotebooks
- Git as a code repository
- Functions, conditional statements and loops in R
- Base and grammer of graphics (ggplot2) in R
- Apply family of functions in R
- Matrix and vector math in R
- Parallel computing
- Basics of Python programming.
- JMP and SAS (outside class lectures)

In the process of learning the above programming methods and platforms, we may also explore the following statistical methods:

- Exploratory Data Analysis tools
- Linear regression
- ANOVA
- Monte Carlo procedures
- Power

**Honor System**

Students enrolled in this course are responsible for abiding by the Honor Code. A student who has doubts about how the Honor Code applies to any assignment is responsible for obtaining specific guidance from the course instructor before submitting the assignment for evaluation. Ignorance of the rules does not exclude any member of the University community from the requirements and expectations of the Honor Code.

The Virginia Tech honor pledge for assignments is as follows: ***"I have neither given nor received unauthorized assistance on this assignment."***