

## COURSE SYLLABUS

### Course Description

Basic principles and techniques in data analytics; methods for the collection of, storing, accessing, and manipulating standard-size and large datasets; data visualization; and identifying sources of bias. The concepts will be implemented with R and some Python.

### Course Materials

All of the following items are required for this course:

- **Fully Charged Laptop** [REQUIRED]
- External Flash Drive [REQUIRED]
- Access to Scholar website [REQUIRED]
- R, RStudio and Python are free to download and use.[REQUIRED]
- **Textbooks:** *"Practical Data Science with R"* by Zumel and Mount; Manning Publishing. AND *"Python for Data Analysis"* by McKinney; O'Reilly Media. [REQUIRED]

### Course Grade

The grading breakdown is as follows:

- |   |                           |     |
|---|---------------------------|-----|
| • Assignments   | (including some in-class) | 20% |
| • Weekly paper  |                           | 20% |
| • Final Project Report (Due December 8 <sup>th</sup> at noon) and<br>Presentation (December 8 and 10) |                           | 60% |

The grading scale will be as follows:

- |                     |    |               |    |
|---------------------|----|---------------|----|
| • [ 93 , $\infty$ ) | A  | • [ 73 , 77 ) | C  |
| • [ 90 , 93 )       | A- | • [ 70 , 73 ) | C- |
| • [ 87 , 90 )       | B+ | • [ 67 , 70 ) | D+ |
| • [ 83 , 87 )       | B  | • [ 63 , 67 ) | D  |
| • [ 80 , 83 )       | B- | • [ 60 , 63 ) | D- |
| • [ 77 , 80 )       | C+ | • [ 0 , 60 )  | F  |

### Assignments

Students are encouraged to work in groups on homework assignments unless otherwise specified by the professor. However, the student's submitted work should represent his/her own ideas. Students are not allowed to copy "word-for-word" answers from each other. Late homework assignments will not be accepted unless approved by the professor in advance. Completed assignments should be submitted by deadline to the Scholar Dropbox, clearly marked with student's name and assignment number, eg. DRoberts\_HW1. Solutions will be posted to general assignments and the student is encouraged to consult them for feedback on their work.

### Weekly Paper

Students cannot succeed in this course without keeping up with the material. The weekly paper should outline the key points of the week's assigned reading, what the student clearly understands from the reading and lectures, and just as importantly, what the student does not understand. Papers are expected

to be approximately 1/2 page in length, typed or legibly handwritten and scanned. Students earn 2 points for each weekly paper to a maximum of 20 points (the student earns the maximum course credit with 10 weekly papers). Weekly papers must be submitted in the Scholar Dropbox by the close of business, each Friday during the semester. The first weekly paper is due August 29. Each paper document should be saved under a name that includes the student's name and the week number, such as: DRoberts\_week1.pdf.

## **Final Project**

---

The final project places students into groups of 3-4 students. Each group will be responsible for putting together an analysis, project report and giving a presentation on a data analysis project with a data set of their choice. The dataset and the project topic should be approved by the instructor in advance. More details about this project will be discussed during the semester. Techniques will be applied on the data set as we cover them. Ideally, such a data set would need to be sufficiently interesting and complex.

Students will submit their projects in their Scholar Dropbox, as well as keep a current update on GitHub. We will learn how to do this throughout the semester; we will also discuss the details of what should be included in the project through the semester.

## **Key to Success**

---

- Read the assigned material from the book.
- Attend lectures and review any lecture notes provided.
- Reread the assigned reading.
- Do the weekly papers.
- Do the assignments. Collaborate with colleagues, ask questions in forum, help others.
- Review the example code and code your own examples. Play around with the software. Find answers online.
- Ask questions in class, access TA's office hour for technical support and other questions, access professors' office hour; have prepared questions.
- Work on your project throughout the semester and be curious about what your data might reveal. Pick a theme of personal interest to you!
- Prepare a professional project report and presentation.
- Team work is vital!

## **SPOT**

---

A mid-semester course evaluation will be conducted to gather feedback about what is working well and what changes would benefit your learning. Toward the end of the semester (November 28 and December 11, 2014), the online Student Perceptions of Teaching (SPOT) questionnaire (<https://eval.scholar.vt.edu>) will be used to gather feedback on particular aspects of the course and instruction. I read and consider all student comments regarding the course and instruction. For example, power point slides are posted prior to class because feedback indicated that this would help students to organize their notes.

## **Honor Code**

---

The Honor Code will be strictly enforced in this course. Each student is expected to behave in such a manner that his/her academic integrity is beyond question. The Honor Code expressly forbids the following academic violations:

- **Cheating:** Cheating includes the actual giving or receiving of any unauthorized aid or assistance or the actual giving or receiving of any unfair advantage on any form of academic work, or attempts thereof.
- **Plagiarism:** Plagiarism includes the copying of the language, structure, ideas and/or thoughts of another and passing off same as one's own, original work, or attempts thereof.
- **Falsification:** Falsification includes the statement of any untruth, either verbally or in writing, with respect to any circumstances relevant to one's academic work, or attempts thereof. Such acts include, but are not limited to, the forgery of official signatures, tampering with official records, fraudulently adding or deleting information on academic documents such as add/drop requests, or fraudulently changing an examination or other academic work after the testing period or due date of the assignment

Any student caught violating the Virginia Tech Honor Code will be reported to the honor court system.

### **Students with Accommodations**

If a student has a disability or an accommodation that is documented with the *Services for Students with Disabilities Office*, it is the student's responsibility to inform the professor as soon as possible.

### **Contacting Your Professor**

Dr. Denisa Roberts  
Office Location: HUTCH 401C  
Office Hrs: MW 2:20-3pm  
E-Mail Address: [dolteanu@vt.edu](mailto:dolteanu@vt.edu)

### **Contacting Your TA**

Xiang Zhang  
Office Hours: W 4-5pm  
Office Location: HUTCH 402  
E-Mail Address: [xiang@vt.edu](mailto:xiang@vt.edu)

### **Other important dates:**

Last day to drop the course	Oct 3rd
Fall break	Oct10-12
Thanksgiving break	Nov22-30
Course withdrawal deadline	Oct 20
Last day of classes	Dec10

Note: *The instructor reserves the right to change administrative policies for the course as the semester progresses. Such policy changes will be communicated to students in class, email or via scholar.*