



Fall 2016

NRS 503 Introduction to Data Analysis and Visualization in R - Course Syllabus -

I. General class information

Course credits

1

Class description

The open-source software package R is a robust, powerful, and versatile data analysis and visualization tool. The overarching goal of this class is to provide students from different disciplines with some foundational knowledge of how to work in R so they feel comfortable using R in some of their future classes, research, and jobs. Specifically, this course will introduce students to R basics (e.g., data input/output, data frames, sorting, R packages), programming (loops, creating functions), data visualization (e.g., scatterplots, boxplots, 3-D plots), and how to run basic statistics in R (descriptive statistics, regression, ANOVA).

Specific learning objectives

The course will give participants hands on experience with R and covers the following topics:

- R basics (e.g. Data input/output, data types, R help)
- Programming (e.g. Looping, creating functions)
- Graphics (Create publication quality graphics)
- Statistics (e.g. descriptive statistics, regression and correlation, multiple regression, ANOVA)

Prerequisites: Knowledge of basic statistics and experience with traditional spreadsheet software packages such as Microsoft Excel. Previous programming experience is **not** required.

Aligning to UI learning outcomes

- Learn and integrate – Through independent learning and collaborative study, attain, use, and develop knowledge in R.
- Think and create – Use multiple thinking strategies to examine real-world issues, solve problems, and make consequential decisions.
- Communicate – Acquire, articulate, create and convey intended meaning using verbal and non-verbal methods of communication that demonstrate respect and understanding in a complex society.

Contact information

Instructor:
Jan Eitel
Phone: (208) 596-9277
e-mail: jeitel@uidaho.edu

Office hours: By appointment
Location: Spirit yurt

Grading

Format: In-class participation and final project.

In-class participation: 50 points (includes journal entries)
Final project: 50 points

Grading basis: A/F
A = 90 points, B = 80 points, C = 70 points, D = 60 points
You can find some more details on grading criteria below.

Text

We won't use a specific text but many of our exercises are based on Peter Dalgaard's book "Introductory Statistics with R". There will be some readings by different authors that will be provided by the instructor at the beginning of class.

Class website

<http://ecosensing.org/teaching/nrs-560>

Reference

There are many good references and tutorials online. A good starting point is the R project website:
<https://www.r-project.org>

II. Class schedule

Saturday, August 27

8 a.m. - 12 p.m.	R basics (e.g. Data input/output, data types, R help)
12 - 1 p.m.	Lunch break
1 - 5 p.m.	Programming (e.g. Looping, creating functions)

Sunday, August 28

8 a.m. - 12 p.m.	Graphics (Create publication quality graphics)
12 - 1 p.m.	Lunch break
1 - 5 p.m.	Statistics (e.g. descriptive statistics, regression and correlation, multiple regression, ANOVA)

III. Assignments

Final project

For your final project, you will be applying some of what you learned in the class to a data analysis and visualization need you might have as part of another class or your research. If you do not have any data analysis and visualization needs, you can also come up with an artificial need but I highly encourage you to use R to explore and visualize a dataset you are familiar with.

Deliverables

The final project should be send to the instructor (jeitel@uidaho.edu) as a single pdf document with the following sections:

- Introduction (0.5 pages max): Shortly explain your data analysis and visualization need and how you used R to address it.
- R script with the following requirements:
 - Header information
 - Comments throughout the script so you can remember a few weeks later what you exactly did

- At least one of the following: if statement, loop (e.g., using the ‘for’ statement), conditional selection (e.g., using ‘which’ statement).
- Data processing step that requires the function from an R package that his not part of the basic R installation
- High quality graphical output
- High quality image of the graphical output
- Results and discussion (0.5 pages maximum): Verbally present your results and shortly discuss them.

Due date

Your final project is due **October, December 14th**. Please feel free to hand in your final project earlier than the indicated due dates.

Late assignments won't be accepted. No exceptions and excuses (e.g., my internet or computer did not work).

Grading criteria

	Max pts	Pts received
Did the author adhere to the basic requirements that were given (e.g., does the R script contain all the required components)?	20	
Did the author clearly and succinctly introduce her data analysis and visualization need?	5	
Is the script well annotated?	5	
Is the visual result appealing?	5	
Are the results and discussion clearly presented?	5	
Complexity of data analysis and visualization need	10	
Total	50	

IV. General Notes

Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services located in the Idaho Commons Building, Room 306 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

- 885-6307
- email at <dss@uidaho.edu>
- website at www.uidaho.edu/dss

University of Idaho Classroom Learning Civility Clause

In any environment in which people gather to learn, it is essential that all members feel as free and safe as possible in their participation. To this end, it is expected that everyone in this course will be treated with mutual respect and civility, with an understanding that all of us (students, instructors, professors, guests, and teaching assistants) will be respectful and civil to one another in discussion, in action, in teaching, and in learning.

Should you feel our classroom interactions do not reflect an environment of civility and respect, you are encouraged to meet with your instructor during office hours to discuss your concern. Additional resources for expression of concern or requesting support include the Dean of Students office and staff (5-6757), the UI Counseling & Testing Center's confidential services (5-6716), or the UI Office of Human Rights, Access, & Inclusion (5-4285).