The R class R programming for biologists

syllabus

> Course number: BOT6935/ZOO6927
>
> 2-credit hours
>
> 611 Carr Hall
>
> Fridays periods 6-8 (12:50 - 3:50 pm)

Instructor: François Michonneau, francois.michonneau@gmail.com, Dickinson Hall

Office hours: By appointment only

Website: http://r-bio.github.io/

Course communication: All communications for this course will take place on Github.

Enrollment cap: 12

Course description

As science becomes increasingly more data and computation intensive, maintaining the ability to build on our own or other's prior work requires that the process that takes data and other

inputs all the way to the results presented in a paper is documented and made available in full detail.

This course will teach participants how to develop workflows going from raw data to graphics and statistical analysis, using the programming language and statistical environment R. Over the course of the semester, participants will learn the skills to write scripts to automate data formatting and analysis, making their studies replicable.

Course Goals

- Understanding and being able to use basic programming concepts
- Automate data analysis
- Working collaboratively and openly on code
- Knowing how to generate dynamic documents
- Being able to use a continuous test-driven development approach

Course format

Lectures

There will be three 3-hour long lectures on January 16th, Februrary 13th, March 13th. The other weeks, the lab will be open and the instructor will be present to help working towards the final project and the package presentation.

Package demonstrations

Towards the end of the semester, each week, a group will present a package of their choice to the rest of the class. This presentation will include a general overview of the package as well as an hands-on part where everyone in the class will have the opportunity to use the package. A draft of the handout and exercises will need to be posted on Github at least 1 week before presentation so that feedback can be provided.

Final project

It's easier to learn programming by doing. Because many of the concepts covered in the class will be new, they will require a significant time commitment to embrace them. Recognizing that time in graduate school is precious, and that the skills taught in this class should be directly applicable, students will work in groups to design a project that will improve, facilitate their current or future research. Working on the project will take most of our classroom time (and will also take time outside of class, actually it has been recommended that students should program at least every other day when learning).

Schedule

This schedule is tentative. Topics and coverage may change. Other topics will be covered in short lectures depending on the interests of the class and needs for the final projects (potential topics include: data manipulation, working with dates, regular expressions, etc.)

date	Topic	Other projects

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January 9?	Software installation, organization of the class, how to use Github	
January 16	Lecture: Version control + Introduction to programming in R	
January 23	Open Lab	Project pitches 1
January 30	Open Lab	Project pitches 2
February 6	Lecture: Graphics in R + knitr and reproducibility	groups are formed
February 13	Open Lab	Project updates
February 20	Open Lab	Project updates
Feburary 27	Open Lab	Project updates
March 13	Lecture: Continuous, test-driven development + How to get data from the web?	
March 20	Open Lab	Package demonstration 1

date	Topic	Other projects
March 27	Open Lab	Package demonstration 2
April 3	Open Lab	Package demonstration 3
April 10	Open Lab	Package demonstration 4
April 17	---	Project presentations

Assessment and Grading

Grading Scale (& GPA equivalent):

Grade	scale
A	100-93
A-	92-90
B+	89-87
B	86-83
B-	82-80
C+	79-77
C	76-73
C-	72-70
D+	69-67

Grade	scale
D	63-66
D-	62-60
E	59-

Participation online (commenting on issues/submit pull requests, etc.) and in class: 34% Package demonstration: 33% Final Project presentation: 33%

Code of conduct

No harassment of participants in any form will be tolerated. Harassment includes offensive verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, sexual images in public spaces, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention.

All communication should be appropriate for a professional audience including people of many different backgrounds. Be kind to others. Do not insult or put down other attendees. Behave professionally. Remember that harassment and sexist, racist, or exclusionary jokes are not appropriate.

Attendees violating these rules may be asked to leave the classroom at the sole discretion. Participants asked to stop any harassing behavior are expected to comply immediately.

Be careful in the words that you choose. Remember that sexist,

racist, and other exclusionary jokes can be offensive to those around you.

If a participant engages in behavior that violates this code of conduct, the instructor may take any action they deem appropriate, including warning the offender or expulsion from the classroom.

Accommodations for Students With Disabilities

Students who will require a classroom accommodation for a disability must contact the Dean of Students Office of Disability Resources, in Peabody 202 (phone: 352 -- 392 -- 1261). Please see the U niversity of Florida Disability Resources website for more information at: http://www.dso.ufl.edu/drc/ . Note that the student should provide documentation of a requirement for accommodation by the second week of classes . No accommodations are available to students who lack this documentation , and accommodations are not retroactive . It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed. Once notification is complete, the Dean of Students Office of Disability Resources will work with the instructor to accommodate t

UF Counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals.

The resources include:

- UF Counseling & Wellness Center, 3190 Radio Rd, 392--1575, psychological and psychiatric services.

- Career Resource Center, Reitz Union, 392--1601, career and job search services.

Many students experience test anxiety and other stress related problems. "A Self Help Guide for Students" is available through the Counseling Center (301 Peabody Hall, 392--1575) and at their web site: hWp://www.counsel.ufl.edu/ .

Honesty Policy

All students registered at the University of Florida have agreed to comply with the following statement:

> "I understand that the University of Florida expects
> its students to be honest in all their academic work. I
> agree to adhere to this commitment to academic
> honesty and understand that my failure to comply
> with this commitment may result in disciplinary
> ac3on up to and including expulsion from the
> University."

In addition, on all work submiWed for credit the following pledge is either required or implied:

> "On my honor I have neither given nor received
> unauthorized aid in doing this assignment."

If you witness any instances of academic dishonesty in this class,

please notify the instructor or contact the Student Honor Court (392-1631) or Cheating Hotline (392-6999). For additional information on Academic Honesty, please refer to the University of Florida Academic Honesty Guidelines at: http://www.dso.ufl.edu /judicial/procedures/academicguide.html .