University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

R Programming – Part 2 (Advanced)

1 credit

MEES 702
Even Falls

Course overview

This course is for students with prior R programming experience. The course provides hands-on experience for learning version control, debugging, writing functions, and code profiling in R language.

The course focuses on the programming part (how to do this and that), however, R is a language for statistical computing, so some basic understanding of statistics is desired. Students may need to consult a statistical text to interpret some code outputs. This course covers only a few statistical procedures; it is not about statistical analysis.

Expected learning outcomes

After taking this course, you will be comfortable with finding and using tools of and for R programming in your research, including

- Version control
- Debugging
- Parallel computing
- Writing R functions and reports

Grading

This course is of tutorial type. The students should follow the posted course materials, complete the practice exercises, and communicate any issues that arise (at the course meetings or on the course online forum). Credits are earned for two homeworks (33% and 33%) and regular activity on GitHub.com (34% for at-least-weekly commits). The course will be graded in a pass/fail system, with a passing grade of at least 71%.

Instructor
Vyacheslav Lyubchich
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410-326-7413

Class meetings
Dates: Mondays
Times: 11:30 am – 12:20 pm
Originating campus: CBL
Zoom meeting ID: 836 8271 1167
Passcode: 1925

Office hours
Tuesdays 10-11 am or
3-4 pm
Zoom meeting ID: 942 6314 7991
Passcode: 1925

Online materials
https://moodle.cbl.umces.edu

Curriculum fulfillment
Fulfills elective MEES requirements.

Prerequisites
None

Teaching Assistant
None

Tentative course schedule

1. Code sharing and version control using Git and GitHub
2. Data scraping, data manipulations
3. Data visualization, R reports
4. Writing R functions
5. Debugging, code profiling
6. Simulations, parallel computing
7. Etc.

Required textbooks and software

Baseline recommended reading:

- Venables, W. N., Smith, D. M. and the R Core Team. An Introduction to R. https://cran.r-project.org/manuals.html
- Torfs, P. and Brauer, C. 2014. A (very) short introduction to R. https://cran.r-project.org/doc/contrib/Torfs+Brauer-Short-R-Intro.pdf
- CRAN Task Views https://cran.r-project.org/web/views/

Required technology includes a personal computer with Internet access at the lectures with the following (free) software installed (recommended installing in the order listed):

- R (https://cran.r-project.org/)
- RStudio (https://posit.co/download/rstudio-desktop/)
- A LaTeX distribution. See on how to install tinytex if you don't have TeXLive (https://www.tug.org/texlive), MiKTeX (http://miktex.org/download, for Windows), or MacTEX (http://www.tug.org/mactex, for Mac) on your computer.
- Git (https://git-scm.com/downloads)
- GitHub Desktop (https://desktop.github.com/)
- Windows users will likely need RTools (https://cran.r-project.org/bin/windows/Rtools/)

Course communication

UMCES courseware server (Moodle, https://moodle.cbl.umces.edu).

Campus policies

The University of Maryland Center for Environmental Science has various academic and research-related policies by which all students and faculty must abide. Please visit this website for a full list of campus-wide academic policies: https://www.umces.edu/consolidated-usm-and-umces-policies-and-procedures.

Consult this website for the official semester dates and holidays: https://provost.umd.edu/calendar.